MEMO

McGOWAN•RUSSELL

To: Robert Scaletta, Olexa Developments
From: Susan Russell
Date: January 2020, Revised May 14, 2020
Subject: MRS D – PUBLIC MARKETS
Review of Separation Distances between Proposed Multi-Family Residential and Existing Industrial

This Memo describes the surrounding industrial and commercial facilities within 1000m of the development site, specifically addressing separation distances between the proposed MRS D multifamily residential and the neighbouring businesses and industries. The review was based on readily available information (i.e. facility websites, environmental registry, aerial photography, etc.) as well as direct observations made during site visits.

The separation distances between the proposed Multi-Family Residential and Existing Industrial was reviewed based upon three parameters

1.0 City of Winnipeg Zoning and Land Use Separation Distances
2.0 Ontario D6-3 Separation Distances
3.0 Environment Act Licensing Process and Requirements

1.0 City of Winnipeg Zoning and Land Use Separation Distances

The City of Winnipeg Zoning By-Law Section 56. (5) Manufacturing Heavy (M3) identifies a minimum separation distance of 300 feet between an M3 zone district and residential zone district. A minimum separation distance is not specified for M1 and M2 zones. All existing M3 industrial are more than 300 feet from the designated multi-family areas proposed in the secondary plan with the exception of:

1) The CN/CP Autopark
2) The industrial properties on the north edge of MRS D along Marion Street

The existing CN/CP Autopark use (Freight or truck yard) and the land uses on the north industrial properties (warehousing, wholesaling and some commercial) are permitted in an M1 zone. CN/CP has advised that they have no intention of changing the land use. The north industrial properties have also advised that they have no plans to change the existing land use and some have expressed an interest in including the rezoning of their properties to M1/MMU with the phase one MRS D rezoning application.

Thus, the proposed secondary plan ensures that all subsequent multi-family rezoning applications should be compliant with the intent of the City of Winnipeg Zoning By-Law with regards to separation distances between residential and industrial zones.

2.0 Ontario D6-3 Separation Distances

In the absence of any Manitoba based Guidelines for separation distances, we have reviewed the proposed MRS D development based on the Ontario D6 Guideline. The Ontario D-6 Guideline categorizes industrial facilities into three classes according to their size, volume of operations and nature of their emissions and outlines a recommended minimum separation distance and potential influence area between industrial facilities and sensitive land uses (eg. residential) for each class as shown in Table 1.

Table 1 Guideline D-6 Recommended Minimum Section Distance and Potential Influence Areas for Industrial Land Uses.

Industry Classification	Recommended Minimum Separation Distance (m)	Potential Influence Area (m)
Class I – Light Industrial	20	70
Class II – Medium Industrial	70	300
Class III – Heavy Industrial	300	1000

The minimum separation distance is the distance (property line to property line or, with inclusion of onsite buffers, measurement taken from source on industry site to where the sensitive activity actually begins, such as habitable building) between the industrial and sensitive land use (such as residential), wherein the industrial land use has the potential to affect the sensitive land uses contained in the area. The potential area of influence is a greater distance in which the industrial operations may have limited potential to affect those sensitive land uses contained in the area, depending upon onsite operations. Sensitive Land Uses that lie outside of an industry's potential area of influence should have no potential for experiencing nuisance issues that would give rise to complaints.

The existing industrial land uses, within 1000m of the MRS D, can be categorized as Class I and Class II. Mitigation measures already in place at the industrial source (required under existing Environmental Act Licenses) further reduces the influence area enabling an industry to be categorized as a lesser class. Thus, in this review the proposed residential multi-family residential falls outside the potential area of influence of ALL existing industrial land uses. Table 3 Industrial Separation as per Ontario D-6 Standard, summarizes compliance with the Ontario D-6 Guidelines. Figure 1 illustrates compliance with comparable existing separations distances and separation distances recommended in the Ontario D-6 Guidelines.

3.0 Environmental Act Licensing Process and Requirements

Eight existing industrial land uses within 1000 m of the proposed MRS D multi-family residential have environmental licenses: one is Class 2, six are Class 1 and one, Industrial Metals, has a Dangerous Goods Handling and Transportation License for a Waste Lead Acid Battery transfer facility. The proposed MRS D multi-family housing is located more than 300m from all licensed industrial land uses (more than 700m from Industrial Metals) and exceeds existing separation distances. The development of the proposed MRS D multi-family housing will not trigger changes to these existing Environment Licensing. However, an investigation into an Environmental License could be triggered if the Director receives five (5) or more complaints that meet the requirements of the Environment Act.

The potential for environmental complaints that could trigger an investigation will be mitigated through the implementation of the following:

1) Mitigation measures incorporated within the proposed multi-family residential buildings at the expense of the developer including sound attenuation and climate control.
2) Agreements that include a warning of potential nuisance effects registered as a condition of subdivision plan approval under the Planning Act. For example, include a condition for the future subdivision plan approval that requires all residential units to be climate controlled to address potential for impacts related to noise and lesser extent odour.

The existing environmental licenses within 1000m of the proposed multi-family residential within the MRS D area summarized on the "Existing Industrial Environmental Licenses" Figure 2 attached.

Table 2 Industrial Separation as per Ontario D-6 Standard

LEGEND:	D-6 Recommended Separation Distance (m)
	0
	20
	70
Bold Text	Indicates Company with Environmental Licence.

CODE	Address	Facility	Street	Land Use	D-6 Industrial Use Class Number	Approximate Distance from Proposed Residential Use to Industrial Use Property Line	D-6 Recommended Minimum Separation Distance (m)	D-6 Potential Area of Influence (m)
A1	860 MARION STREET	Garage/Warehouse	MARION STREET	Garage / indoor storage	n/a	190m	0	0
B1	385 DAWSON ROAD N	International Fur Dressers & Dryers Co Ltd	DAWSON ROAD N	Fur dressing/clothing manufacturing	2	430m	70	300
B2	393 DAWSON ROAD N	Magic Messenger/Lawn Man Inc.	DAWSON ROAD N	Office/Contractor's yard	n/a	405m	0	0
B3	415 DAWSON ROAD N	Hawk Auto & Truck Accessories	DAWSON ROAD N	Vehicle accessory retail and wholesale	n/a	332m	0	0
B4	463 DAWSON ROAD N	J&R Livestock Consulting	DAWSON ROAD N	office	n/a	314m	0	0
B5	906 DOWSE STREET	Storage	DOWSE STREET	External vehicle storage	1	752m	20	70
B6	910 DOWSE STREET	Storage	DOWSE STREET	External vehicle Storage	1	752m	20	70
B7	963 DUGALD ROAD	Jade Transport Ltd/SHIFT Products	DUGALD ROAD	Trucking yard with trailer storage	1	788m	20	70
B8	985 DUGALD ROAD	Vieville Building Movers Inc/Techno Metal Post	DUGALD ROAD	contractor's yard and outdoor vehicle storage	1	863m	20	70
B9	999 DUGALD ROAD	Thomas Auto and Tire	DUGALD ROAD	Vehicle Maintenance	n/a	897m	0	0
B10	1009 DUGALD ROAD	Tom's Truck and Trailer Repair	DUGALD ROAD	Vehicle repair shop	n/a	890m	0	0
B11	333 HOLDEN STREET	Vermeer Canada Inc.	HOLDEN STREET	Construction Equipment Sales office and yard	1	767m	20	70
B12	341 HOLDEN STREET	Centennial Transport & Leasing Ltd	HOLDEN STREET	Freight shipping and trucking	1	754m	20	70
B13	361 HOLDEN STREET	McBride Auto Ltd	HOLDEN STREET	Vehicle maintenance/repair/storage	n/a	816m	0	0
B14	901 MAGINOT STREET	Transportation Department of Louis Riel Division	MAGINOT STREET	school bus parking	1	652m	20	70
B15	911 MAGINOT STREET	Laurin Sheet Metal Ltd	MAGINOT STREET	sheet metal (heating and cooling contractor) office	n/a	825m	0	0
B16	955 MAGINOT STREET	Trimac - National Tank Services	MAGINOT STREET	Trucking yard with trailer storage and tank cleaning	1	755m	20	70
B17	593 MARION STREET	Brass and Bones Tattoo Company	MARION STREET	tattoo parlor	n/a	240m	0	0
B18	1041 MARION STREET	Winnipeg Car-Pro	MARION STREET	Vehicle maintenance and repair	n/a	827m	0	0
B19	1051 MARION STREET	Pro-Ag Products	MARION STREET	Animal Feed storage and sale	2	857m	70	300
B20	1065 MARION STREET	Marion Auto Body & Glass	MARION STREET	Vehicle maintenance and repair	n/a	905m	0	0
B21	**50 PANET ROAD**	**Cloverdale Paint**	**PANET ROAD**	**Paint manufacturing and warehouse**	**2 (3) see note 1**	**447m**	**70**	**300**
B22	16 SPEERS ROAD	Star Building Material	SPEERS ROAD	Warehouse/Commercial Storefront	1	759m	20	70

Table 2 Industrial Separation as per Ontario D-6 Standard

CODE	Address	Facility	Street	Land Use	D-6 Industrial Use Class Number	Approximate Distance from Proposed Residential Use to Industrial Use Property Line	D-6 Recommended Minimum Separation Distance (m)	D-6 Potential Area of Influence (m)
B23	29 SPEERS ROAD	Star Building Material	SPEERS ROAD	lumber yard	2	948m	70	300
C1	**210 DAWSON ROAD N**	**Lafarge Ready Mix**	**DAWSON ROAD N**	**Concrete Manufacturing**	**2**	**610m**	**70**	**300**
C2	220 DAWSON ROAD N	CAA Car Care Centre	DAWSON ROAD N	Vehicle maintenance and repair	n/a	538m	0	0
C3	300 DAWSON ROAD N	Western Industrial Services Ltd. (WISL)	DAWSON ROAD N	contractor's establishment	1	538m	20	70
C4	314 DAWSON ROAD N	Gerdau Metals Recycling - Recycle Your Ride	DAWSON ROAD N	Metal Recycling	2	420m	70	300
C5	328 DAWSON ROAD N	Great Western Containers Inc.	DAWSON ROAD N	Manufacture of Industrial containers and packaging	1	318m	20	70
C6	360 DAWSON ROAD N	Champ Industries	DAWSON ROAD N	Metal fabrication and welding	1	318m	20	70
C7	370 DAWSON ROAD N	A-1 Select Auto Sales	DAWSON ROAD N	Vehicle maintenance and repair/storage	n/a	318m	0	0
C8	390 DAWSON ROAD N	U-Haul Dealer	DAWSON ROAD N	Vehicle rental	n/a	213m	0	0
C9	450 DAWSON ROAD N	St Boniface Warehousing Ltd	DAWSON ROAD N	Indoor Warehouse	1	211m	20	70
C10	500 DAWSON ROAD N	Vacant	DAWSON ROAD N	Vacant	n/a	213m	0	0
C11	**607 DAWSON ROAD N**	**Rothsay**	**DAWSON ROAD N**	**Animal rendering and processing**	**2**	**492m**	**70**	**300**
C12	805 DUGALD ROAD	Vacant	DUGALD ROAD	Vacant	n/a	612m	0	0
C13	815 DUGALD ROAD	Ballycastle Distributors Ltd	DUGALD ROAD	cabinetry and millwork	1	612m	20	70
C14	895 DUGALD ROAD	Mr. Boom Truck Inc.	DUGALD ROAD	Mobil Crane Services	1	665m	20	70
C15	901 DUGALD ROAD	Professional Grinding Inc.	DUGALD ROAD	Metal grinding	1	665m	20	70
C16	905 DUGALD ROAD	Vacant	DUGALD ROAD	Vacant	n/a	675m	0	0
C17	909 DUGALD ROAD	Vacant Office	DUGALD ROAD	Vacant	n/a	676m	0	0
C18	919 DUGALD ROAD	Regent Construction	DUGALD ROAD	Contractor's office	n/a	680m	0	0
C19	927 DUGALD ROAD	Wes-Man Mechanical	DUGALD ROAD	Contractor's office	n/a	720m	0	0
C20	976 DUGALD ROAD	Resource One Agency/Key Printers/First Avenue Office Furnishings	DUGALD ROAD	office	n/a	712m	0	0
C21	992 DUGALD ROAD	Transcona Roofing	DUGALD ROAD	Contractor's office / yard	1	726m	20	70
C22	346 DUPUY AVENUE	Vacant	DUPUY AVENUE	Vacant	n/a	183m	0	0
C23	347 DUPUY AVENUE	A&A Auto Works	DUPUY AVENUE	Vehicle maintenance and repair	n/a	282m	0	0
C24	349 DUPUY AVENUE	Kloos Hauling & Demolition	DUPUY AVENUE	Office/Industrial Storage (exterior)	1	296m	20	70
C25	350 DUPUY AVENUE	Horizon International Distributors	DUPUY AVENUE	trucking yard	1	366m	20	70

Table 2 Industrial Separation as per Ontario D-6 Standard

CODE	Address	Facility	Street	Land Use	D-6 Industrial Use Class Number	Approximate Distance from Proposed Residential Use to Industrial Use Property Line	D-6 Recommended Minimum Separation Distance (m)	D-6 Potential Area of Influence (m)
C26	380 DUPUY AVENUE	XL Transportation	DUPUY AVENUE	Trucking Office	1	366m	20	70
C27	276 HOLDEN STREET	Great Western Ventilation Inc.	HOLDEN STREET	HVAC Maintenance Office	n/a	699m	0	0
C28	**870 LAGIMODIERE BOULEVARD**	**Maple Leaf Foods**	**LAGIMODIERE BOULEVARD**	**meat processing plant**	**2 (3) see note 1**	**736m**	**70**	**300**
C29	613 MARION STREET	Piston Rings	MARION STREET	Vehicle parts retail	n/a	205m	0	0
C30	625 MARION STREET	Telecom Options	MARION STREET	Office building	n/a	203m	0	0
C31	645 MARION STREET	Mission Industrials	MARION STREET	Vacant	n/a	203m	0	0
C32	663 MARION STREET	Vacant	MARION STREET	Vacant	n/a	203m	0	0
C33	699 MARION STREET	Packers Auto Body and Glass	MARION STREET	Vehicle Maintenance and repair	n/a	161m	0	0
C34	711 MARION STREET	East Man Feeds Grain Elevator	MARION STREET	vacant	2	154m	70	300
C35	736 MARION STREET	CN/CP Autopark	MARION STREET	Outdoor storage of cars for distribution	1 (2) see note 2	0m	20	70
C36	747 MARION STREET	Clima Seal Inc.	MARION STREET	Office/warehouse	1	154m	20	70
C37	750 MARION STREET	Access Storage/Fire Plan Strategies/ Fit Fab Holistic Therapies/United Road	MARION STREET	Office/warehouse storage	1	0m	20	70
C38	753 MARION STREET	General Window Products of Canada	MARION STREET	Office /warehouse	1	154m	20	70
C39	761 MARION STREET	Eldon's Service/ PGW Defense Technologies Inc./ Proline Heating &	MARION STREET	office and commercial	n/a	154m	0	0
C40	800 MARION STREET	ABC Fire Safety Equipment	MARION STREET	Warehouse/office	1	0m	20	70
C41	835 MARION STREET	Logberg-Heimskringla Inc.	MARION STREET	Warehouse/manufacturing	1	154m	20	70
C42	850 MARION STREET	Central Display/Fortified Nutrition/GA Cabling Services Ltd/GA Technical	MARION STREET	Office/warehouse	1	0m	20	70
C43	864 MARION STREET	Fire Station	MARION STREET	Winnipeg Fire and Paramedic Service	n/a	144m	0	0
C44	874 MARION STREET	Eastside Collision Repairs/Thrifty Car Rental	MARION STREET	Vehicle maintenance and repair/storage	1	169m	20	70
C45	903 MARION STREET	Malnar Industries Ltd	MARION STREET	Refrigeration manufacturing	1	461m	20	70
C46	928 MARION STREET	Janico Investments Ltd./Kennedy Energy/Petro Pass Truck Stop	MARION STREET	Warehouse/Gas Station/ External storage	1	332m	20	70
C47	**945 MARION STREET**	**Interprovincial Cooperative Ltd./IPCO**	**MARION STREET**	**Agriculture chemical formulating and storage**	**2(3) see note 1**	**318m**	**70**	**300**
C48	975 MARION STREET	National Concrete Accessories	MARION STREET	Office/Warehouse/External Storage	1	574m	20	70
C49	995 MARION STREET	Subway	MARION STREET	Restaurant	n/a	683m	0	0
C50	1011 MARION STREET	Husky	MARION STREET	Gas Station	n/a	708m	0	0
C51	1016 MARION STREET	Panthers Gymnastics Ltd.	MARION STREET	Gym	n/a	464m	0	0

Table 2 Industrial Separation as per Ontario D-6 Standard

CODE	Address	Facility	Street	Land Use	D-6 Industrial Use Class Number	Approximate Distance from Proposed Residential Use to Industrial Use Property Line	D-6 Recommended Minimum Separation Distance (m)	D-6 Potential Area of Influence (m)
C52	1031 MARION STREET	Allaire Custom Metal / Lance Roofing Ltd.	MARION STREET	Steel fabrication	1	789m	20	70
C53	1032 MARION STREET	Domo	MARION STREET	Gas Station	n/a	576m	0	0
C54	6 NICOLAS AVENUE	Envirotech Ag Systems Ltd	NICOLAS AVENUE	Office for farm systems solutions	n/a	264m	0	0
C55	24 NICOLAS AVENUE	Finer Feeds	NICOLAS AVENUE	shipping and receiving	n/a	264m	0	0
C56a	**30 NICOLAS AVENUE**	**Bituminex Ltd.**	**NICOLAS AVENUE**	**Asphalt Plant**	**2**	**445m**	**70**	**300**
C56b	40 NICOLAS AVENUE	Superior Asphalt Paving Co. Ltd	NICOLAS AVENUE	Office and contractor's yard	1	495m	20	70
C57	**50 NICOLAS AVENUE**	**SCMS Inc.**	**NICOLAS AVENUE**	**Contractor's yard**	**1**	**518m**	**20**	**70**
C58	70 NICOLAS AVENUE	CMO HVAC - Winnipeg Heating & Cooling/I-way Transport Inc. Wings	NICOLAS AVENUE	Warehouse and shipping	1	364m	20	70
C59	70 PANET ROAD	Warehouse	PANET ROAD	Warehouse for Cloverdale paint	1	561m	20	70
C60	77 PANET ROAD	Napa Auto Parts	PANET ROAD	Car Part sales	n/a	560m	0	0
C61	105 PANET ROAD	Paramount Windows	PANET ROAD	Window manufacturing	1	680m	20	70
C62	110 PANET ROAD	Husky Oil Marketing Company District Office	PANET ROAD	Office	n/a	673m	0	0
C63	140 PANET ROAD	Horizon Livestock & Poultry Supply	PANET ROAD	Animal Feed storage and sale	2	734m	70	300
C64	1 SPEERS ROAD	Champion Iron Works	SPEERS ROAD	Fabrication of Metal and Structural Steel	2	675m	70	300
C65	4 SPEERS ROAD	Storage Compound	SPEERS ROAD	Lumber yard	2	783m	70	300
C66	9 SPEERS ROAD	Warehouse	SPEERS ROAD	Warehouse for Champion Iron Works	2	760m	70	300
C67	17 SPEERS ROAD	Masterfeeds/Feed Mill Store	SPEERS ROAD	Animal Feed storage and sale	2	778m	70	300
C68	24 SPEERS ROAD	Warehouse	SPEERS ROAD	Office	n/a	948m	0	0
C69	400 TURENNE STREET	FC Machinery	TURENNE STREET	Office/machine sales	1	472m	20	70
C70	405 TURENNE STREET	Multi-tenant building	TURENNE STREET	Restaurant	n/a	567m	0	0
C71	410 TURENNE STREET	Rental Experts	TURENNE STREET	Machine Rental	n/a	472m	0	0
C72	420 TURENNE STREET	Eng Tech Consulting	TURENNE STREET	Engineering office	n/a	497m	0	0
Note 1	Existing Manitoba Environmental License required mitigation measures at the industrial source enable this industry to be categorized as a lesser Class thereby reducing the minimum separation distance and potential area of influence.							
Note 2	Outside storage of cars for distribution is permitted in an M1 zone. The potential negative impact of frequent movement of trucks during daytime hours is mitigated through buffering techniques on the proposed residential site enabling this use to be categorized as a lesser Class thereby reducing the minimum separation distance.							

FIGURE 1

REVIEW OF COMPARABLE SEPARATION DISTANCES:

1. ONTARIO D-6 SEPARATION BETWEEN INDUSTRIAL FACILITIES AND RESIDENTIAL USES

CLASS I	20m
CLASS II	70m
CLASS III	300m

THE INDUSTRIAL USES WITHIN 1000m OF THE PROPOSED RESIDENTIAL LAND USES IN MRS D ARE ALL CONSIDERED CLASS I OR CLASS II FACILITIES (WITH EXISTING ENVIRONMENTAL LICENCE MITIGATION MEASURES IN PLACE WHERE APPLICABLE)

2. COMPARISON TO EXISTING CONDITION, SEPARATION DISTANCES BETWEEN EXISTING INDUSTRIAL AND EXISTING RESIDENTIAL, ILLUSTRATES THAT THE LOCATION OF PROPOSED RESIDENTIAL EXCEEDS EXISTING SEPARATION DISTANCES

LEGEND

- 20m FROM PROPOSED RESIDENTIAL
- 70m FROM PROPOSED RESIDENTIAL
- 300m FROM PROPOSED RESIDENTIAL
- EXISTING RESIDENTIAL LAND
- PROPOSED MULTI-FAMILY RESIDENTIAL LAND USE IN MRS D
- PROPOSED POTENTIAL MULTI-FAMILY RESIDENTIAL LAND USE WITHIN COMMERCIAL MIXED USE ZONING IN MRS D

PUBLIC MARKETS - MAJOR REDEVELOPMENT SITE D

SEPARATION DISTANCES BETWEEN EXISTING INDUSTRIAL AND PROPOSED MULTI-FAMILY RESIDENTIAL
COMPARISON TO EXISTING CONDITION AND ONTARIO D6 STANDARD

FIGURE 2

SCMS LTD., 50 NICOLAS AVENUE, CLASS 1 ENVIRONMENTAL LICENCE 3196
110.63m TO EXISTING RESIDENTIAL
518.33m TO PROPOSED RESIDENTIAL

BITUMINEX LTD., BETWEEN NICOLAS AND DUPUY, CLASS 1 ENVIRONMENTAL LICENCE 1134R
235.58m TO EXISTING RESIDENTIAL
419.77m TO PROPOSED RESIDENTIAL

INTERPROVINCIAL COOPERATIVE, 945 MARION, CLASS 1 ENVIRONMENTAL LICENCE 2195RR
378.54m TO EXISTING RESIDENTIAL
317.21m TO PROPOSED RESIDENTIAL

MAPLE LEAF FOODS, 870 LAGIMODIERE BLVD., CLASS 1 ALTERED ENVIRONMENTAL LICENCE 240V
57.21m TO EXISTING RESIDENTIAL
659.60m TO PROPOSED RESIDENTIAL

CLOVERDALE PAINT INC., 50 PANET ROAD, CLASS 1 ENVIRONMENTAL LICENCE 3139
53.96m TO EXISTING RESIDENTIAL
453.42m TO PROPOSED RESIDENTIAL

(ROTHESAY) DARLING INTERNATIONAL CANADA INC., 607 DAWSON ROAD. CLASS 2 ENVIRONMENTAL LICENCE 1085RR, WITH ALTERATIONS 2015 AND 2018
280.12m TO EXISTING RESIDENTIAL
439.54m TO PROPOSED RESIDENTIAL

SHELL CANADA 250 PANET ROAD., CLASS 1 ENVIRONMENTAL LICENCE 1019
152.37m TO EXISTING RESIDENTIAL
820.55m TO PROPOSED RESIDENTIAL

LAFARGE CANADA INC. POTABLE CONCRETE BATCH PLANT, CLASS 1 ENVIRONMENTAL LICENCES 3301, 3053r, &/OR 3259
152.37m TO EXISTING RESIDENTIAL
820.55m TO PROPOSED RESIDENTIAL

<u>DANGEROUS GOODS HANDLING AND TRANSPORTATION</u>
INDUSTRIAL METALS, 550 MESSIER ST., ENVIRONMENTAL LICENCE 265HW
244.71m TO EXISTING RESIDENTIAL
701.73m TO PROPOSED RESIDENTIAL

LEGEND

- EXISTING RESIDENTIAL LAND USED FOR MEASUREMENTS
- PROPOSED RESIDENTIAL LAND USE IN MRS D USED FOR MEASUREMENT
- PROPOSED POTENTIAL MULTI-FAMILY RESIDENTIAL LAND USE WITHIN COMMERCIAL MIXED USE ZONING IN MRS D

PUBLIC MARKETS - MAJOR REDEVELOPMENT SITE D

EXISTING INDUSTRIAL ENVIRONMENTAL LICENSES WITHIN 1000m OF PROPOSED MULTI-FAMILY RESIDENTIAL

DILLON CONSULTING

7319704 MANITOBA LTD.

Emergency Access Evaluation

Redevelopment of Former Canada Packers Lands, Winnipeg, Manitoba

May 2020 | 20-2062

May 5, 2020

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Attention: Robert Scaletta

Emergency Access Evaluation – Redevelopment of Former Canada Packers Lands, Winnipeg, Manitoba

Dear Robert:

Dillon Consulting Limited has completed an emergency access evaluation (the Study) for the redevelopment of the former Canada Packers Lands (the Development) in Winnipeg, Manitoba. Given that the Development is bordered by Canadian National Railway and Canadian Pacific Railway's freight rail operations, the City of Winnipeg Fire and Paramedic Services (WFPS) are concerned about access to the Development in response to an emergency call. As such, objectives of the Study were to answer two questions:

1. What is the probability of one or more of the three grade level crossings to be blocked, when WFPS is responding to a call within the Development?
2. If one or more of the three grade level crossings are blocked when WFPS is responding to a call within the Development, is there an increase in response time, and if so, what is the response time for WFPS?

An evidence-based approach was taken to objectively analyze and measure both the likelihood and consequences, such that there is sufficient confidence and certainty to make an informed decision about the acceptability of the public safety risks within the Development. Our findings and conclusions are presented in this report for consideration in your discussions with the City of Winnipeg.

Sincerely,

DILLON CONSULTING LIMITED

Dave Poole, M.Sc., P.Eng., CRM
Partner

DP:sls

Our file: 20-2062

Table of Contents

Executive Summary

Findings – Rail Operations Analysis vi
Findings – Fire and Paramedic Response Analysis vi
Findings – Risk Analysis vii
Conclusions viii

1.0 **Introduction** **1**

1.1 Overview of Proposed Development 1
1.2 Scope of Emergency Access Evaluation 3
1.3 Qualifications of Project Team 3
1.4 Limitations 4
1.5 Databases and Records Utilized to Conduct Emergency Access Evaluation 4
1.6 Organization of Report 5

2.0 **Project Description** **7**

2.1 Overview of Proposed Development 7
2.2 Freight Rail Overview 9
2.2.1 City of Winnipeg 9
2.2.2 Proposed Development 10
2.2.3 Rail Accident Statistics 13

3.0 **Rail Operations Analysis** **15**

4.0 **Fire and Paramedic Response Analysis** **19**

4.1 Projected Calls for Emergency Services 19
4.2 Fire and Paramedic Services Response Analysis 19
4.2.1 Methodology 19
4.2.2 Fire and Paramedic Response Performance Measures 21
4.3 Winnipeg Fire Paramedic Services Background Data 21
4.4 Fire and Paramedic Response Analysis and Results 24

4.4.1 Baseline Response Scenarios (A and B) 24
4.4.2 Response Scenario of One Rail Crossing Blocked (A and B) 34
4.4.3 Response Scenario of Two Rail Crossings Blocked Simultaneously (A and B) 47
4.5 Consideration of Site Evacuation Routes 61

5.0 **Risk Analysis** **62**

6.0 **Conclusions** **65**

7.0 **Closure** **67**

Figures

Figure 1: Location of Planning Area (approximate) 1
Figure 2: Conceptual Development Plan, dated May 8, 2019 8
Figure 3: Freight Rail Network in City of Winnipeg (Source – Railway Association of Canada 2014 Atlas) 9
Figure 4: Correlation between GDP and Freight Tonnage Hauled in Canada 16
Figure 5: Baseline Response Scenario A City-Wide Initial Arriving Company Results 26
Figure 6: Baseline Response Scenario B City-Wide Initial Arriving Company Results 27
Figure 7: Baseline Response Scenario A Site-Specific Initial Arriving Company Results 28
Figure 8: Baseline Response Scenario B Site-Specific Initial Arriving Company Results 29
Figure 9: Baseline Response Scenario A City-Wide Initial Full Alarm Assignment Results 30
Figure 10: Baseline Response Scenario B City-Wide Initial Full Alarm Assignment Results 31
Figure 11: Baseline Response Scenario A Site-Specific Initial Full Alarm Assignment Results 32
Figure 12: Baseline Response Scenario B Site-Specific Initial Full Alarm Assignment Results 33
Figure 13: One Blocked Crossing Scenario A1 – Initial Arriving Company 35
Figure 14: One Blocked Crossing Scenario A1 - Initial Full Alarm Assignment 36
Figure 15: One Blocked Crossing Scenario B1 – Initial Arriving Company 37
Figure 16: One Blocked Crossing Scenario B1 - Initial Full Alarm Assignment Results 38
Figure 17: One Blocked Crossing Scenario A2 – Initial Arriving Company Results 39
Figure 18: One Blocked Crossing Scenario A2 - Initial Full Alarm Assignment Results 40

Figure 19: One Blocked Crossing Scenario B2 – Initial Arriving Company Results 41
Figure 20: One Blocked Crossing Scenario B2 - Initial Full Alarm Assignment Results 42
Figure 21: One Blocked Crossing Scenario A3 – Initial Arriving Company Results 43
Figure 22: One Blocked Crossing Scenario A3 - Initial Full Alarm Assignment Results 44
Figure 23: One Blocked Crossing Scenario B3 – Initial Arriving Company Results 45
Figure 24: One Blocked Crossing Scenario B3 - Initial Full Alarm Assignment Results 46
Figure 25: Worst Case Response Scenario A1 - Initial Arriving Company Results 48
Figure 26: Worst Case Response Scenario A1 - Initial Full Alarm Assignment 49
Figure 27: Worst Case Response Scenario B1 - Initial Arriving Company Results 50
Figure 28: Worst Case Response Scenario B1 - Initial Full Alarm Assignment 51
Figure 29: Worst Case Response Scenario A2 - Initial Arriving Company Results 52
Figure 30: Worst Case Response Scenario A2 - Initial Full Alarm Assignment Results 53
Figure 31: Worst Case Response Scenario B2 - Initial Arriving Company Results 54
Figure 32: Worst Case Response Scenario B2 - Initial Full Alarm Assignment Results 55
Figure 33: Worst Case Response Scenario A3 - Initial Arriving Company Results 56
Figure 34: Worst Case Response Scenario A3 - Initial Full Alarm Assignment Results 57
Figure 35: Worst Case Response Scenario B3 - Initial Arriving Company Results 58
Figure 36: Worst Case Response Scenario B3 - Initial Full Alarm Assignment Results 59
Figure 37: Event Tree – Scenarios leading to Grade Crossing Blockage during an Emergency Call 62

Tables

Table 1: Databases Utilized for the Study 4
Table 2: Summary of Grade Level Rail Crossing within City of Winnipeg 10
Table 3: Number of Rail Accidents involving Proceeding Activity in Canada between 2004 and 2019 13
Table 4: Number of Rail Accidents involving Switching Activity in Canada between 2004 and 2019 13
Table 5: CN and CP Freight Rail Traffic Summary for the Year 2020 15
Table 6: Summary of Blockage Time for Grade Level Crossings 17

Table 7: Findings of Rail Operations Analysis for Three Scenarios of Blocked Crossings – Year 2030 18
Table 8: Emergency Response Calibration by Road Classification 20
Table 9: WFPS Stations, Staffed Apparatus and Minimum On-Duty Staffing 22
Table 10: Summary of Baseline Response Scenario Results 34
Table 11: Summary of One Blocked Crossing Scenarios Results 47
Table 12: Summary of Worst Case Response Scenarios (Two Blocked Crossings) Results 60
Table 13: Summary of Conditional Probabilities for Blockage of Each Grade Level Crossing during an Emergency Call from within Development 63
Table 14: Determination of Conditional Probabilities for Grade Crossing Blockage Scenarios 64
Table 15: Results of Conditional Probabilities for Grade Crossing Blockage Scenarios – Year 2030 ... 64
Table 16: Relevant Questions to be Answered by the Study 65

Executive Summary

7319704 Manitoba Ltd. (Developer) is proposing to redevelop the former Canada Packers' Lands in Winnipeg, Manitoba (herein called "the Development"), which will be approximately 165 acres in size and will consist of:

- Higher density residential (1,200 units);
- Commercial
- Employment Lands; and
- Public Reserve.

The Development is bordered by:

- Marion Street to the north;
- Canadian Pacific Railway (CP) freight rail line to the west;
- Canadian Nation Railway (CN) freight rail line to the east and northeast;
- Paddington Yard – a freight rail yard owned by CP, and utilized by both CN and CP; and
- CN/CP Autoyard – part of Paddington Yard, where CP and CN offload automobiles from rail cars.

In the event of an emergency call from within the Development, the Winnipeg Fire Paramedic Service (WFPS) would have to cross one of the three grade level rail crossings (two on Marion Street and one on Speers Road) to access it. As such, WFPS is concerned about response time delays, in case of an emergency call from within the Development, due to blockages of one or more of the three grade level rail crossings.

Dillon Consulting Limited was retained by the Developer to evaluate the emergency response accessibility to the Development. The scope of work included:

- **Rail Operations Analysis** – determining the reasonable circumstances (or scenarios) that would lead to one or more of the three grade level rail crossings being blocked, taking into consideration the crossing(s) being blocked under normal rail operations; and the crossing(s) being blocked due to a rail accident. For each scenario, the length of time that the grade level crossing would be blocked was estimated.
- **WFPS Response Analysis** – determining the number of emergency calls that is reasonable to predict will occur within the Development. Assessing the predicted travel times and abilities to assemble staff on-scene, as WFPS responds to emergency calls within the Development. This analysis takes into consideration the existing WFPS's station locations and staffing levels, and applies a GIS-based model to estimate the potential delays to emergency response, as a result of various scenarios of blockages on the grade level crossings that bound the Development.
- **Risk Analysis** – determining the probability of having one or more of the three grade level crossings being blocked at the same time, as WFPS is dispatched to respond to a call from within

the Development, and whether the Development improves accessibility to existing lands that are bordered by CN and CP.

Findings – Rail Operations Analysis

The analysis of rail operations took into consideration both current freight rail traffic, but given that freight rail traffic is directly correlated to gross domestic product (GDP), the growth of freight rail traffic needed to be considered. Future growth in rail operations was forecasted to the Year 2030, based on the correlation between nominal GDP and volume/tonnage of rail traffic in Canada over the past 18 years. This translated to an estimated 33.9% increase in rail traffic volumes for both CN and CP between 2020 and 2030.

Finding 1. There is a 9.27% chance that one of the three grade level crossings will be blocked at any point in time. For two grade level crossings to be blocked at the same time, the probability drops to 0.277%. The chance of having all three grade level crossings blocked at the same time is 0.00263%.

Finding 2. On average, it is reasonable to expect each of the grade level rail crossings to be blocked between 28.5 and 55.3 minutes per day (24 hours).

Finding 3. Currently, there are two existing grade level crossings that WFPS can utilize to access existing lands north and south of Marion Street that are between the CN and CP freight rail lines. Inherently, the risk of having both the CP and CN Marion Street grade level crossings being blocked at the same time is 0.068%. It also means that there is a 99.932% chance of at least one crossing being open. The Development and its internal road network will increase the connectivity to existing grade level rail crossings from two to three providing better access to lands bordered by CN and CP. It will provide one additional access point from the east connecting to the existing Speers Road grade level crossing. Therefore, the chance of having all three grade level crossings blocked at the same time is 0.00263%. By increasing the number of grade level crossings that can be used to access the lands north and south of Marion Street from two to three, there is a 96% net improvement in accessibility [(0.068 – 0.00263)/0.068] = 96%.

Findings – Fire and Paramedic Response Analysis

Finding 4. There is an 87% chance each day that there will be an emergency call from within the Development that will require WFPS to be dispatched. This would consist of 255 medical calls and 61 fire calls per year, based on an estimated residential population of 2,000 people – 1.67 persons per unit with 1,200 residential units.

Finding 5. The baseline coverage of the initial arriving company and the full alarm assignment responding to the proposed Development from existing WFPS stations is very good, with the entire site modelled to meet the National Fire Protection Association's (NFPA's) 1710 performance targets. This good level of coverage is maintained with the consolidation of Station 9 as well.

Finding 6. Under the six scenarios where one of the three grade level crossings are blocked (both including and excluding Station 9), WFPS can respond to the Development with an initial arriving apparatus in four minutes or less of travel time and can assemble an initial full alarm assignment of 15 firefighters within eight minutes of less of travel time, meeting the NFPA's 1710 performance targets in five of the six scenarios. The only delay modelled occurs when the CP Marion Street crossing is blocked and Station 9 is excluded in the response, resulting in up to five minutes of travel time for the initial arriving apparatus to reach approximately half of the Development. The remainder of the development is covered within four minutes, and the initial full alarm assignment target is met.

Finding 7. The only 'Worst Case Scenario' including existing Station 9 that results in delays to the initial arriving apparatus is the potential closure of both CP Marion and CN Marion Street grade level crossings at the same time (i.e., **Worst Case Scenario A3**). In this scenario, the travel time is modelled to increase from four to five minutes for approximately half of the site area, with small pockets of area reflecting six minute travel times. The initial full alarm assignment response coverage is not impacted by the two rail crossings being blocked with Station 9 in its existing location.

Finding 8. The 'Worst Case Scenarios' that reflect the potential consolidation of Station 9 do indicate that some parts of the proposed development could experience initial arriving apparatus travel times of up to eight minutes. This is comparable to the travel times between four to eight minutes provided to 33% of the City of Winnipeg's (the City's) area measured under Baseline Response Scenario A with Station 9 in its existing location. The initial full alarm assignment response coverage is modelled to reach the vast majority of the Development, with the two rail crossings being blocked when Station 9 is consolidated. There is only one very isolated pocket modelled in the northeast corner of the site, which indicates less than 15 firefighters would arrive within the eight minute travel time measure.

Findings – Risk Analysis

Finding 9. There is a 8.07% chance that one of the three grade level crossings would be blocked at the same time there is an emergency call from within the Development. The chances of this occurring drop to 0.241% if two grade level crossings are blocked at the same time. There is a 0.00228% chance for all three grade level crossings to be blocked at the same time as WFPS is responding to an emergency call from within the Development.

Conclusions

Based on the findings of the Emergency Access Evaluation, the following concluding statements can be made (Note – all values are based on projected growth in train traffic to the Year 2030):

- 91.93% chance that all three grade level rail crossings will be open during an emergency call.
- 99.759% chance that at least two grade level rail crossings will be open during an emergency call.
- 99.998% chance that at least one grade level rail crossing will be open during an emergency call.
- The Development and its internal road network will increase the connectivity to existing grade level rail crossings from two to three, providing better access to lands bordered by CN and CP. It will provide one additional access point from the east connecting to the existing Speers Road grade level crossing. The chance of having all three grade level crossings blocked at the same time is 0.00263%. By increasing the number of grade level crossings that can be used to access the lands north and south of Marion Street from two to three, there is a 96% net improvement in accessibility [(0.068 – 0.00263)/0.068] = 96%.
- The response of the WFPS to the Development achieves the initial arriving company and initial full alarm assignment performance targets, when all three of the rail crossings are open in scenarios that both include and exclude Station 9.
- The response of the WFPS to the Development achieves the initial arriving company and initial full alarm assignment performance targets in five of the six scenarios, where one of the three rail crossings is blocked.
- When two of the three rail crossings are blocked the WFPS response to the Development achieves the initial arriving company performance targets in three of the six scenarios and achieves travel times of between four to eight minutes in the other three scenarios.
- When two of the three rail crossings are blocked the WFPS response to the Development achieves the initial full alarm assignment performance targets to the entire site with the exception of three scenarios that identify small isolated areas below the target.
- In scenarios with identified response delays measured against the initial arriving apparatus performance target, the travel times range from four to eight minutes to reach the entire Development. This performance is comparable to the travel times between four to eight minutes provided to 33% of the City's area measured under Baseline Scenario A (the City's existing conditions).

In conclusion, based on the analysis and findings presented within this report, in the event that one or two of the grade level rail crossings are blocked, the predicted response times of the WFPS to the Development continue to meet the performance targets or remain within the range of existing service levels provided across the City of Winnipeg. The likelihood of having at least one grade level crossing open during an emergency call is 99.998%, or that within a 43,783 year time frame, it is reasonable to expect there will be one incident where all three grade level rail crossings would be closed during an emergency call from within the Development.

1.0 Introduction

1.1 Overview of Proposed Development

The Public Markets (herein called the "Planning Area") is located in the St. Boniface neighbourhood and comprises approximately ±222 acres of land. It was formerly used for industrial purposes associated with the Union Stockyards and Canada Packers plant that occupied the site until it was closed in 1988 (see **Figure 1**).

Figure 1: Location of Planning Area (approximate)



Existing land uses within the Planning Area, occupying approximately 57 acres, include a 24-hour inter-modal rail-to-truck transfer facility (Canadian National Railway [CN]/ Canadian Pacific Railway [CP] Autoyard) located in the southwest corner of the Planning Area, Paddington Yards located along the southern boundary of the Planning Area, commercial businesses along Marion Street, and a metal fabrication facility on the southeast corner of the Planning Area. The developable area is 165 acres (herein called the "Development" or "Study Area").

The Development is to consist of the following land uses:

- Higher density residential (1,200 units)
- Commercial;
- Employment Lands; and
- Public Reserve.

The Development is bordered by:

- Marion Street to the north;
- CP's freight rail line to the west;
- CN's freight rail line to the east and northeast;
- Paddington Yard – a freight rail yard owned by CP and utilized by both CN and CP; and
- CN/CP Autoyard – part of Paddington Yard where CP and CN offload automobiles from rail cars.

Vehicular access to the Development will be from Marion Street to the north and from Speers Road to the southeast. In the event that the Winnipeg Fire Paramedic Service (WFPS) are dispatched to respond to a call from within the Development, there are three grade level rail crossings available to WFPS vehicles. However, given that freight rail operations conducted by CN and CP can result in one or more of the three grade level crossings to be occupied, questions are being asked about the ability of WFPS to meet the level of service requirements for the Development. Specifically:

a) What is the probability of one or more of the three grade level crossings being blocked, when WFPS is responding to a call within the Development?
b) If one or more of the three grade level crossings are blocked when WFPS is responding to a call within the Development, is there an increase in response time, and if so, what is the response time for WFPS?

Dillon Consulting Limited (Dillon) was retained by the Developer to conduct an Emergency Access Evaluation study (herein called "the Study") that answered the above-referenced two questions. Inherently, the questions focus on risk. Risk is defined as:

RISK = The likelihood of the event X The consequences of the event,

Where the "event" is the blockage of one or more of the three grade level crossings at the same time as WFPS is responding to a call from within the Development. Therefore, the goal of the Study is to take an evidence-based approach to objectively analyze and measure both the likelihood and consequences, such that there is sufficient confidence and certainty to make an informed decision about the acceptability of the public safety risks within the Development.

1.2 Scope of Emergency Access Evaluation

The scope of the Study involved:

- Rail Operations Analysis;
- Fire and Paramedic Response Analysis; and
- Risk Analysis.

For the Rail Operations Analysis, we determined:

- The reasonable circumstances (or scenarios) that would lead to one or more of the three grade level rail crossings being blocked, taking into consideration:
    - The crossing being blocked under normal rail operations; and
    - The crossing being blocked due to a rail accident.
- For each scenario, the length of time that the grade level crossing will and could be blocked.

For the Fire and Paramedic Response Analysis, we determined:

- The number of emergency calls that is reasonable to be expected from within the Development.
- The time for WFPS to respond to an emergency call from within the Development, taking into consideration:
    - No blockages of any of the three grade level rail crossings; and
    - One or more of the three grade level crossings being blocked.

For the Risk Analysis, we determined:

- The probability of having one or more of the three grade level crossings being blocked at the same time as WFPS is dispatched to respond to a call from within the Development.
- The increase (if any) in response time by WFPS due to one or more of the grade level crossings being blocked.
- Whether the Development improves accessibility to existing lands that are bordered by CN and CP.

1.3 Qualifications of Project Team

The Study was led by a Certified Risk Manager (CRM) and Professional Engineer with technical support provided by fire and emergency services, risk analysts, and transportation engineering. Our Team has extensive experience across Canada working with land developers, Class 1 Railways and municipalities to address rail proximity issues associated with various types of land developments. This includes not only conducting property-specific risk assessments, but also supporting the development of new land use policy for developments adjacent to rail corridors and assessing the risks of rail crossing applications adjudicated by the Canadian Transportation Agency.

In addition to Dillon, our Team included the following subconsultants:

- **Dominion Rail Services** – An Edmonton based firm that provides railway industry expertise – planning and implementing rail capacity expansion, develop operational solutions and support engineering design for rail expansion projects. Their staff includes former CN and CP employees with direct rail operational knowledge of Winnipeg.
- **Fjord Consulting** – A Calgary based consultancy firm founded by the former Director of Environmental Programs and former Legal Counsel at CP. They have extensive regulatory understanding of rail issues, and the adjudication of conflicts between the Class 1 Railways and municipalities across Canada, including Winnipeg. They have also participated on numerous rail risk assessments across Canada.

1.4 Limitations

To complete the Study, information was obtained from three sources: 1) engineering, fire and emergency services, railway operations, and regulatory subject matter experts; and 2) publically available documents and records. While every effort was made to minimize potential errors and omissions, there are some limitations. These limitations are noted where applicable in the report.

1.5 Databases and Records Utilized to Conduct Emergency Access Evaluation

A summary of the publically available databases and records that were utilized to conduct the Study are summarized in **Table 1**.

Table 1: Databases Utilized for the Study

Publishing Organization	Dataset Title	Dataset Description and Limitations
Transportation Safety Board (**TSB**)	Railway occurrence data from January 2004	Selected data pertaining to accidents and reportable incidents from the TSB's Rail Occurrence Database System from January 2004. This database is updated on, or soon after, the 15th of each month. The TSB states that: "*As these data are extracted from a live database that captures the results of ongoing investigations, historical data are subject to change, with the oldest data being the most stable. As many occurrences are not investigated formally (see the Occurrence Classification Policy), information recorded on some occurrences may not have been verified.*"
Transport Canada (**TC**)	Grade Crossings Inventory	Includes details of public and private grade road grade crossings within provincial and federal jurisdiction. TC states that the at-grade crossings on the Government of Canada's Open Data Portal was generated by TC. This list provides the location and other details, as well as a ranking of risk, using the GradeX tool. The GradeX tool is an internal TC web-based analysis tool that compares crossings against each other, based on the several risk factors.

Publishing Organization	Dataset Title	Dataset Description and Limitations
National Railway Network (**NRWN**)	National Railway Network - NRWN - GeoBase Series[1]	Provides a geometric description and a set of basic attributes of Canadian railways. The data is separated into one linear feature (Track), four punctual features (Junction, Crossing, Marker Post and Station) and includes numerous descriptive attributes of these features.
Railway Association of Canada (RAC)	Rail Trends Reports	The Rail Trends Report summarizes the performance of Canada's railway industry. It contains performance data and a rolling 10-year review of financial and statistical results, reflecting multiple aspects of railway performance in Canada. The data in Rail Trends is reported by RAC member companies: Class 1 and shortline freight railways, as well as tourist, intercity and commuter passenger rail service providers. Canadian Class 1 freight railways (CN and CP) account for the majority of freight rail activity in Canada. For that reason, most of the data presented in Rail Trends reflects Class 1 carriers.
Government of Canada (Natural Resources Canada)	Topographical Data of Canada – CanVec Series – Transport Features	The transport features of the CanVec series are derived from the National Road Network and the NRWN. The dataset describes roads, trails, bridges, railroads and their related information. The transport features include nautical facilities, track segments, track junctions, railway stations, track crossings, track marker posts, track structures, rail ferry segments, road segments, road ferry segments, road junctions, blocked passages, toll points, aerial cableway features, footbridges, trails, navigational aids, marinas and runways. The CanVec multiscale series is available as prepackaged downloadable files and by user-defined extent via a Geospatial data extraction tool.[2]

The TSB data is presented as a function of time, where rail accidents are time stamped. The TC and NRWN data are limited in the sense that they are not available as a function of time. The TC and NRWN data provide only a snapshot of the existing status of the railways and their features. Information within the RAC Rail Trends Reports was utilized to correlate and downscale national freight rail operations to a local level within the Study Area. Combined with the merger of the TSB, NRWN, and TC databases, we are able to complete geo-spatial analysis of rail occurrences and complete time-based trend analysis.

1.6 Organization of Report

In addition to **Section 1**, this report is organized in five parts, as follows:

Project Description: **Section 2** of this report provides an overview of the Development and freight rail operations within the City of Winnipeg (the City), and national rail statistics.

[1] Developed by Natural Resources Canada under the Earth Sciences Group - see http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/-/(urn:iso:series)geobase-national-railway-network-nrwn?sort-field=relevance

[2] Transport Networks in Canada – CanVec Series – Transport Features https://open.canada.ca/data/en/dataset/2dac78ba-8543-48a6-8f07-faeef56f9895

Rail Operations Analysis: In **Section 3,** we respond to the question regarding the circumstances that could lead to one or more of the grade crossings being blocked, and the likelihood of it occurring.

Fire and Paramedic Response Analysis: In **Section 4**, we estimate the frequency of emergency calls from within the Development and determine the implications to WFPS response times, when one or more of the grade level crossings are blocked.

Risk Analysis: We combine the Rail Operations and Fire and Paramedic Response Analysis in order to assess the risks, both in terms of likelihood and consequences of having one or more of the three grade level crossings blocked at the same time as WFPS is responding to an emergency call within the Development in **Section 5** of the report.

Conclusions: In **Section 6**, we summarize the key findings and provide concluding statements regarding the risks if the Development were to proceed. As well, we determine whether there are any net improvements to the existing risk of WFPS responding to an emergency call within the existing land uses.

2.0 Project Description

2.1 Overview of Proposed Development

The Planning Area will be developed as an employment hub, including industrial and commercial uses, complemented by high density residential and recreational uses. A wide range of employment opportunities will be provided in a business park setting and the Public Markets will offer retail, institutional, active, and passive recreation for employees, residents, and visitors.

The Development is located within the Planning Area at the former Canada Packer's Lands in Winnipeg, and is approximately 165 acres in size. It is proposed to be mixed-use and will be zoned for the following:

- Higher density residential (1,200 units)
- Commercial
- Employment Lands
- Public Reserve

Refer to **Figure 2** - A conceptual Development Plan, dated May 8, 2019.

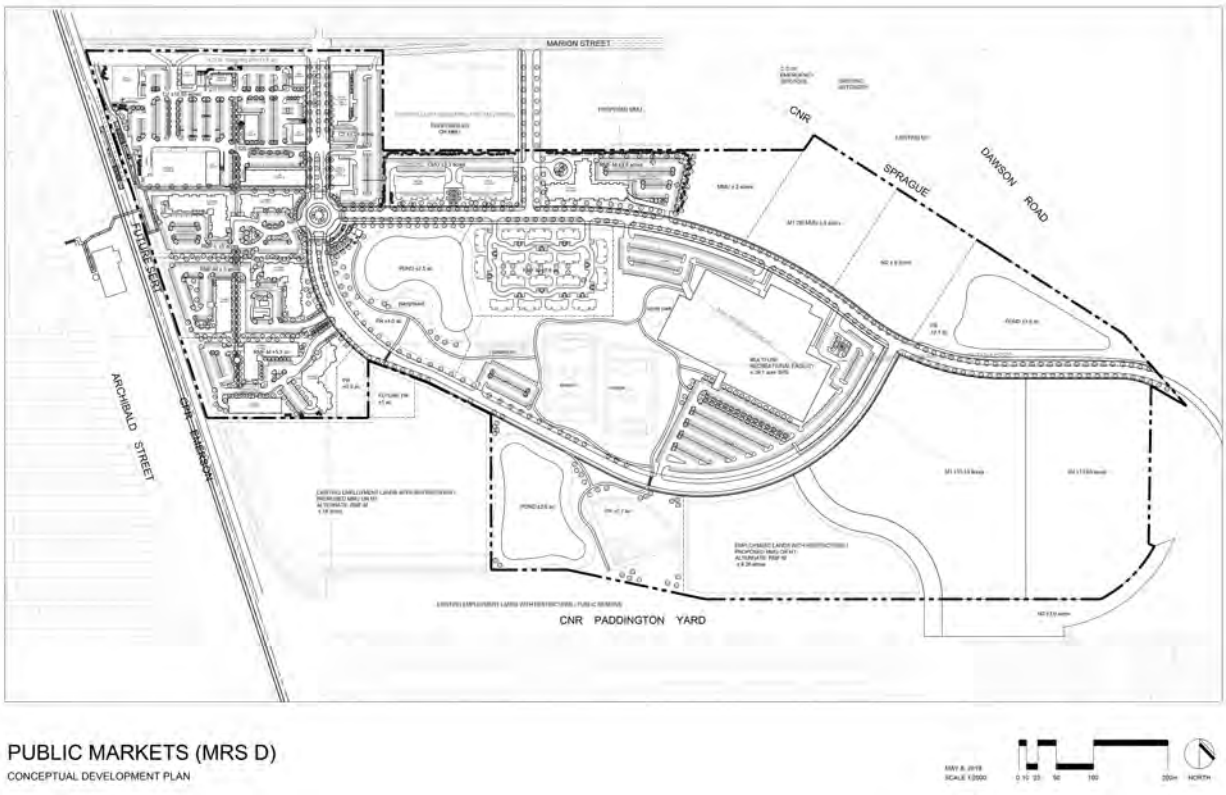
There will be three primary vehicular access[3] points to the Development:

1. Marion Street at Louis Riel Way/Dupuy Avenue (primary access)
2. Marion Street (approximately 275 m east of the primary access on Marion Street)
3. Speers Road (at Maginot Street)

The estimated population for the Development within the Higher Density Residential lands is estimated to be 2,000 based on a population density of 1.67 people per unit x 1,200 units.

[3] Source: Development of MRS-D Traffic Impact Study, Draft Report for Review by Client, August 12, 2019

Figure 2: Conceptual Development Plan, dated May 8, 2019



2.2 Freight Rail Overview

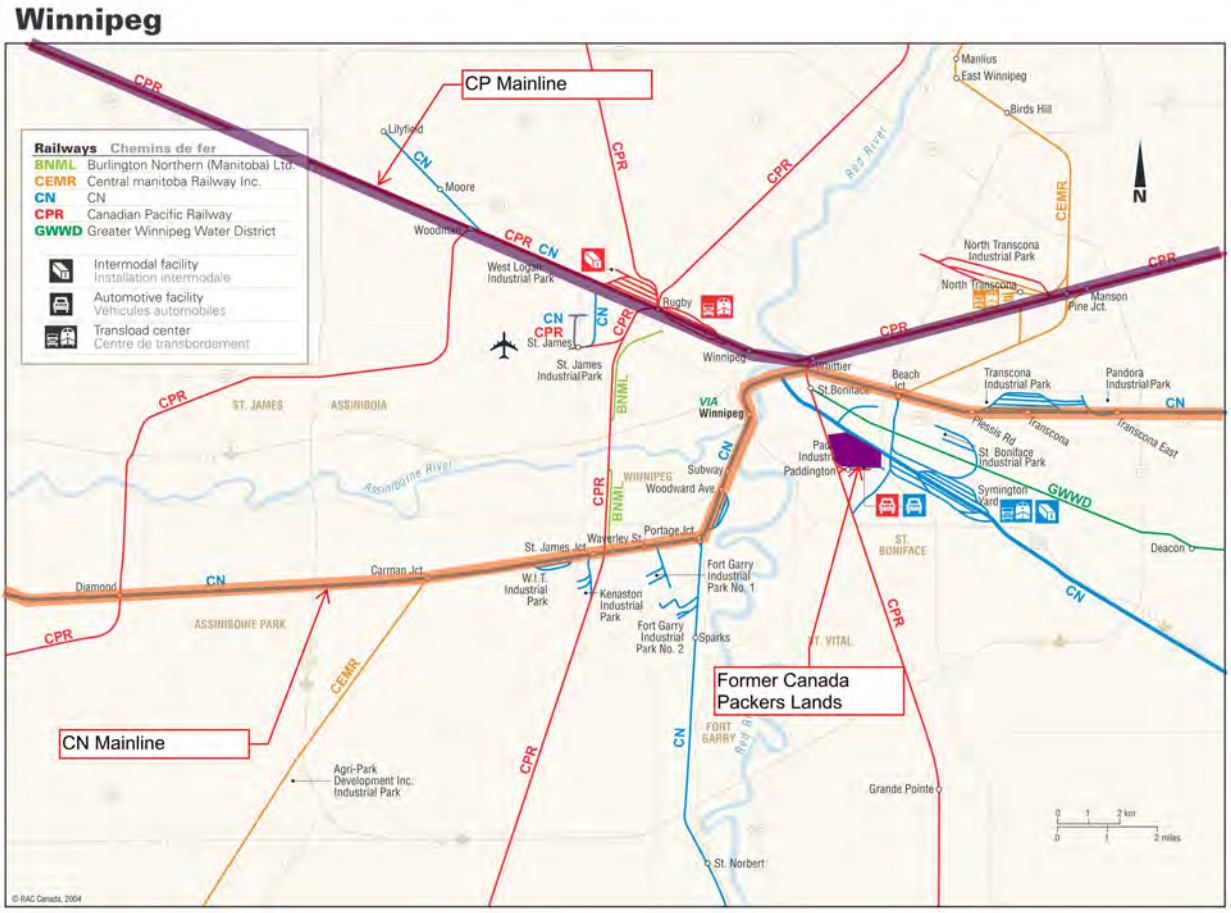
2.2.1 City of Winnipeg

There are three Class 1 Railways that operate within the City:

- Burlington Northern (Manitoba) Ltd.
- CN
- CP

A shortline railway – Central Manitoba Railway Inc. operates two sets of tracks, one in the southwestern and one at the northeast part of the City. In addition, the City owns and operates the Greater Winnipeg Water District Railway that is utilized to service the Viaduct. In total, there is 98.59 miles of track within the City's limits (see **Figure 3**).

Figure 3: Freight Rail Network in City of Winnipeg (Source – Railway Association of Canada 2014 Atlas)



The volume of freight rail traffic within the City does vary, largely depending on whether the traffic is considered local (i.e., servicing customers within and proximity to the City) or associated with transcontinental freight traffic within the United States and Canada. Local freight traffic volumes vary between one to seven trains per day, while transcontinental freight rail traffic volumes vary between 17 to 35 trains per day on CN and CP's mainline, highlighted in **Figure 3**.

According to the 2019 Rail Trends[4] report, published by the RAC, the average number of rail cars per freight train is 113 for 2018, with an average car length of approximately 22.83 m (about 75 ft.). This equates to 8,475 ft. for an average train length in Canada. For local freight traffic within the City, the train length varies between 2,000 and 9,000 ft., while the transcontinental freight trains can be upwards of 10,000 ft. and longer. Freight train speeds[5] within the City vary from a minimum of 10 miles per hour (mph) to a maximum of 70 mph.

Within the City's limits, there are a total of 239 grade level rail crossings according to the TC Grade Crossing database[5], as shown in **Table 2**.

Table 2: Summary of Grade Level Rail Crossing within City of Winnipeg

Type of Grade Level Crossing	Active Warning System	Passive Warning System	Total
Public	148	109	257
Private	3	10	13
Total	**151**	**119**	**270**

Notes: Active Warning System – consists of flashing lights with bells or flashing lights with bells and gate.
Passing Warning System – cross-buck sign or cross-buck sign with either stop or yield sign.

Based on the number of public grade level rail crossings within the City's limits, this translates to an average of 257/98.59 = one public grade level crossing for every 2.6 miles of track.

2.2.2 Proposed Development

CP's Emerson Subdivision borders the Development to the west and CN's Sprague Subdivision (also called the "St. Boniface Yard Lead") borders the Development to the northeast. CP operates a rail yard called Paddington Yard to the south, where there is an automotive off-loading area (CN/CP Autoyard) for new vehicles that are parked in an open area to the north of Paddington Yard. Paddington Yard is also serviced by CN via a spur line from the Sprague Subdivision (also called "Industrial Yard Lead") to the east, which allows for both CN and CP to exchange rail cars from their respective customers (as needed) to meet their service obligations under the *Canadian Transportation Act*.

[4] https://www.railcan.ca/wp-content/uploads/2019/12/2019_Rail_Trends.pdf
[5] https://www.tc.gc.ca/eng/railsafety/railsafety-1000.html

2.2.2.1 CP Emerson Subdivision

The Emerson Subdivision connects CP's transcontinental rail network to the north with the United States' border at Emerson, Manitoba to the south. The section of the Emerson Subdivision that borders the Development is between Milepost 1.0 and 2.0. According to the TC grade crossing database, the posted speed limit for trains in this section of the Emerson Subdivision is 25 mph; however, for trains that are inbound to and outbound from Paddington Yard, the speed is typically in the 10 mph range.

There is one grade level rail crossing on the Emerson Subdivision within proximity of the Development:

- Marion Street at Milepost 1.55:
    - Crosses two tracks.

A summary of current (Year 2020) rail operations at the CP Marion Street crossing that were analyzed for the Study are below:

- Number of Trains per day = 6 of which:
    - 4 = number of trains that proceed either north or south bound.
    - 2 = number of trains that exit/enter Paddington Yard onto Emerson Subdivision.
- Length of Train = 2,000 to 9,000 ft.
- Given the configuration of the "Y" track connecting Paddington Yard to the CP Emerson Subdivision, any switching activities that do take place will not result in the CP Marion Street crossing being blocked.
- North of the Marion Street crossing, the Emerson Subdivision crosses the CN St. Boniface Yard Lead – the intersection is called a "Diamond". Traffic on the Diamond is controlled by CN Dispatch, and there is the potential for a northbound CP train to "wait" for the CN Dispatcher to clear the Diamond so that the northbound CP train can safely proceed to cross the Diamond. If this were to occur, there is the potential that the CP train would block the Marion Street crossing.

2.2.2.2 CN St. Boniface Yard Lead

The St. Boniface Yard Lead (which is part of the Sprague Subdivision) starts from the junction with CN's transcontinental rail network to the north and terminates at the west end of CN's Symington Yard, and is mainly used to service industrial customers in the area. The CP Emerson Subdivision crosses the St. Boniface Yard Lead at this section of the Sprague Subdivision which is called a Diamond. All train traffic that crosses the Diamond (both CP and CN) is controlled by CN Dispatch.

The section of the St. Boniface Yard Lead that borders the Development is between Milepost 0.09 and 0.92. According to the TC grade crossing database, the posted speed limit for trains in this section of the St. Boniface Yard Lead is 20 mph.

There is one grade level crossing on the Emerson Subdivision within proximity of the Development:

- Marion Street at Milepost 0.92:
  - Crosses one track.
- Length of Train = 3,000 to 5,000 ft.

A summary of current (Year 2020) rail operations at the CN Marion Street crossing that were analyzed for the Study are below:

- Number of Trains per day = 8 of which:
  - 6 = number of trains that proceed either east or west bound.
    - 3 round trips (6 total movements) to a client facility each week (7 days) plus between 3 to 5 additional trains per day. Therefore, the actual movements was calculated as (6 movements/7 days) + 5 = 5.857. For presentation purposes, it was rounded up to 6.
    -
  - 2 = number of trains that are conducting switching operations to service industrial customers.

2.2.2.3 CN Industrial Yard Lead

The Industrial Yard Lead (which is part of the Sprague Subdivision) starts from the west end of CN's Symington Yard and end at CP's Paddington Yard. It is mainly used to service the automotive compound at Paddington Yard and interchange freight cars with CP. According to the TC grade crossing database, the posted speed limit for trains in Industrial Yard Lead is 10 mph.

There is one grade level crossing on the Emerson Subdivision within proximity of the Development:

- Speers Road at Milepost 0.11:
  - Crosses one track.
- Length of Train = 3,000 to 5,000 ft.

A summary of current (Year 2020) rail operations at the CN Speers Road crossing that were analyzed for the Study are below:

- Number of Trains per day = 4.1 of which:
  - 1 = number of trains every 14 days (or 0.1 trains/day) that proceed in or out of Paddington Yard.
  - 4 = number of trains that are conducting switching operations at Paddington Yard.

2.2.3 Rail Accident Statistics

We analyzed the national rail accident statistics from the TSB between January 1, 2004 and September 9, 2019[6], in order to downscale within the City. The focus was on the relevant freight rail operations that occur within proximity of the Development, specifically:

- Proceeding – a freight train that is traveling along the tracks at speeds that are less than or equal to the posted speed limit of the specific subdivision.
- Switching – the process of a freight train moving from one track to another track by means of a rail switch. This activity occurs at lower train speeds, typically in the 10 to 15 mph range.

Given that the intent of the Study is to determine the likelihood of the grade level crossings being blocked due to rail operations, we therefore focused on all plausible rail accidents regardless of its severity. The analysis is summarized in **Table 3** and **Table 4.**

The rail accident statistics are grouped by a) Main-Track; and b) Non-Main-Track by the TSB. The majority of the 98.59 miles of track within the City are designated as Main-Track – that includes the transcontinental network and the branch lines illustrated in **Figure 3**. The CP Emerson Subdivision and the St. Boniface Lead (or Sprague Subdivision) are considered Main-Track. The CN Industrial Yard Lead is considered Non-Main-Track – spur lines that are connected to the Main-Track that service industrial customers and rail yards.

Table 3: Number of Rail Accidents involving Proceeding Activity in Canada between 2004 and 2019

Type of Rail Accident involving Proceeding Activity	Total	Results in Fatal Injuries	Results in Serious Injuries	No Injuries
Crossing Accidents[1]	2,779	344	386	2,049
Main-Track Train Derailments and Collisions[2]	1,686	6	7	1,673
Non-Main-Track Train Derailments and Collisions[2]	1,852	0	1	1,851
Trespassing Accidents[1]	1,084	707	303	74

Note: 1) Injury to the Public
2) Injury to the Public or Rail Employee

Table 4: Number of Rail Accidents involving Switching Activity in Canada between 2004 and 2019

Type of Rail Accident involving Switching Activity	Total	Results in Fatal Injuries	Results in Serious Injuries	No Injuries
Non-Main-Track Train Derailments and Collisions[2]	8,112	3	6	8,103
Crossing Accidents[1]	187	1	7	179
Main-Track Train Derailments and Collisions[2]	133	0	1	132
Trespassing Accidents[1]	23	5	14	4

Note: 1) Injury to the Public

[6] Latest available data from the Transportation Safety Board at the time that the Study was completed.

2) Injury to the Public or Rail Employee

It should be noted that the severity of the derailments are not reflected within the statistics in **Table 3** and **Table 4** because a derailment[7] is defined by the TSB as:

"Derailment" means any instance where one or more wheels of rolling stock have come off the normal running surface of the rail.

Given that switching operations involve one or more freight rail cars being moved from one set of tracks to another, they cross over a switch that connects the two sets of tracks, which is often the focal point for one or more wheels to come off the surface of the rail.

[7] Refer to https://www.tsb.gc.ca/eng/stats/rail/2018/sser-ssro-2018.html

3.0 Rail Operations Analysis

There are three grade level rail crossings that vehicles are required to cross in order to access existing lands and the Development:

1. CP Marion Street Crossing;
2. CN Marion Street Crossing; and
3. CN Speers Road Crossing.

The primary focus of the rail operations analysis is two-fold:

1. Determine the circumstances that could lead to one or more of the grade level crossings being blocked; and
2. Determine the likelihood of one or more of the grade level crossings being blocked.

Under normal rail operations, proceeding and switching activities will result in each of the three grade level rail crossings being blocked each time the activity occurs. Based on our understanding of current rail operations as summarized in **Section 2.2**, we calculated the number of minutes each time that each of the three grade level crossings would be blocked for each activity in **Table 5**.

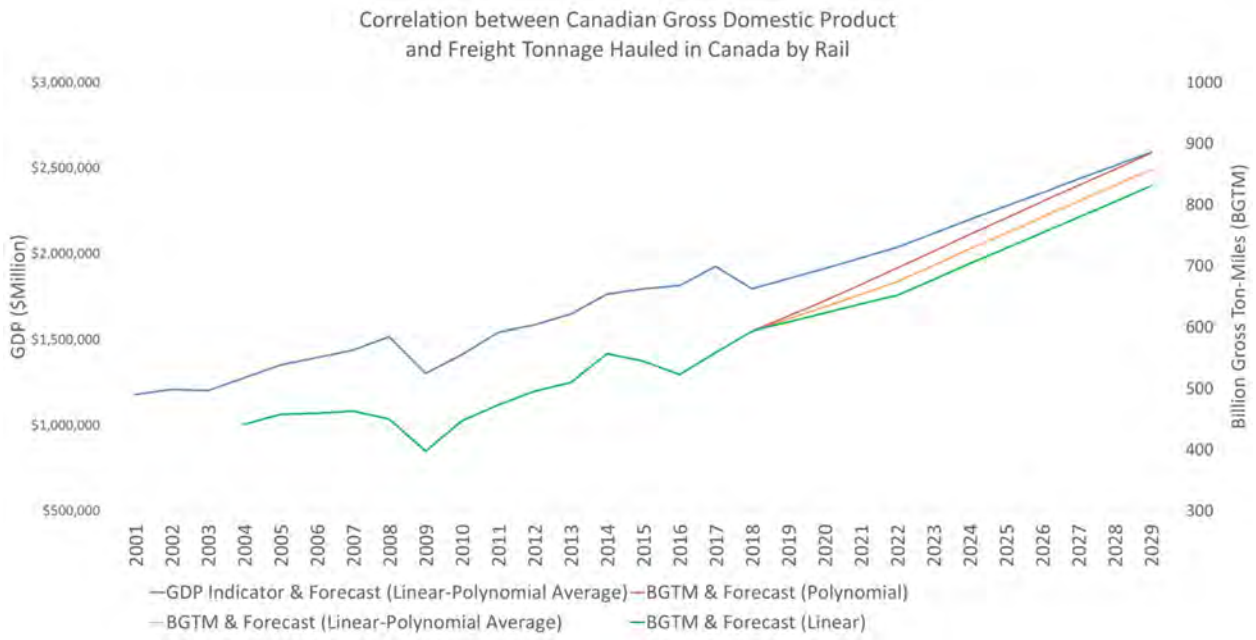
Table 5: CN and CP Freight Rail Traffic Summary for the Year 2020

Crossing	Operational Activities that Blocks the Crossings	MAX Train Speed (MPH)	Estimated MAX Train Length (Ft.)	Occupied /Blocked Per Activity (minutes)[1]	# Movements per Day (24 hrs)
CN St. Boniface Yard Lead CN Marion Street crossing blocked	CN Proceeding	20	5,000	3	6[3]
	CN Switching	10	3,000	10	2
CN Industrial Yard Lead CN Speers Road crossing blocked	CN Switching	10	3,000	10	4
	CP Proceeding	10	5,000	6	0.1[2]
CP Emerson Subdivision CP Marion Street crossing blocked	CP Proceeding	25	9,000	4	4
	CP Proceeding	10	2,000	2	2
	CP Waiting	n/a	9,000	6	n/a

Note: 1) Values rounded to the nearest whole number.
2) Based on 1 train movement every two weeks.
3) Value rounded to the nearest whole number – refer to Section 2.2.2.2 for additional details.

For our analysis, we took into consideration current train traffic volumes (as of the Year 2020), but also projected future growth of freight rail traffic into the Year 2030 (= 33.9%) based on a financial model developed by Dillon that correlates freight rail traffic to gross domestic product (GDP).

Figure 4: Correlation between GDP and Freight Tonnage Hauled in Canada



In addition to normal rail operations, rail accidents can result in one or more of the grade level crossings being blocked. Using the rail statistics summarized in **Table 3** and **Table 4**, we grouped the rail accidents into three broad categories:

1. Derailment;
2. Crossing Accident; and
3. Trespassing Accident.

The severity of freight train derailments vary in scale and scope, and for the purpose of this Study, we grouped them by a) those that are unlikely to pose a public safety risk; and b) those that have the potential to pose a public safety risk. Using the national TSB rail accident statistics, we calculated derailment incident rates that were downscaled to local rail operations next to the Development. If the derailment resulted in the blockage of a grade level crossing, we estimated the blockage to last three hours for less severe derailments and 12 hours for more severe derailments that could pose a public safety risk.

Similarly for crossing accidents, we grouped them based on whether the accident resulted in an injury to the public. Using the national TSB rail accident statistics, we calculated crossing accident rates that would then applied to each of the three grade level crossings within our Study Area. If the crossing accident did not result in a public injury, we assumed the crossing would be cleared in one hour. If there was an injury to the public, we assumed the crossing would be cleared in three hours.

A trespassing accident occurs when a member of the public has unauthorized access to the rail right-of-way and is then subsequently struck by a passing train. In all historical trespassing accidents across

Canada, the trespasser is at a minimum seriously injured but often fatally injured. In either case, we are assuming that rail operations would shutdown to investigate the scene, resulting in a grade level crossing being blocked for three hours.

A summary of our rail analysis is provided in **Table 6**. Given that the causes of a grade level crossing being blocked, as shown in **Table 6**, are independent of each other, the total amount of time occupied/blocked per day was summed. Therefore, independently, it is reasonable to expect each of the grade level crossings to be occupied between 1.98% and 3.84% of the time, or between 28.5 minutes and 55.3 minutes each day. For CP waiting, derailment, crossing and trespassing accidents, the event/accident rates were converted to a corresponding minutes occupied based on the intensity of rail operations. In other words, blockages caused by normal rail operations **will occur**; whereas, blockages caused by a CP train waiting or a rail accident **could occur** within a specified time frame.

Table 6: Summary of Blockage Time for Grade Level Crossings

Crossing Blocked	Causes of a Grade Level Crossing to be Blocked	Minutes Occupied/ Blocked per Day (Current)	% Time Occupied/ Blocked per Day (Current)	Minutes Occupied/ Blocked per Day (Year 2030)	% Time Occupied/ Blocked per Day (Year 2030)
CN Marion Street Crossing blocked	Derailment	0.0017	0.00012%	0.002	
	Crossing Accident	0.0039	0.00027%	0.005	
	Trespassing Accident	0.0038	0.00027%	0.005	
	CN Proceeding	16.6396	1.15553%	22.280	
	CN Switching	20.4545	1.42045%	27.389	
	Total	**37.1 minutes**	**2.58%**	**49.7 minutes**	**3.45%**
CN Speers Road Crossing blocked	Derailment	0.0011	0.00008%	0.001	
	Crossing Accident	0.0023	0.00016%	0.003	
	Trespassing Accident	0.0054	0.00037%	0.007	
	CN Switching	40.9091	2.84091%	54.777	
	CN Proceeding	0.4058	0.02818%	0.543	
	Total	**41.3 minutes**	**2.87%**	**55.3 minutes**	**3.84%**
CP Marion Street Crossing blocked	Derailment	0.0015	0.00010%	0.002	
	Crossing Accident	0.0039	0.00027%	0.005	
	Trespassing Accident	0.0038	0.00027%	0.005	
	CP Proceeding	20.9091	1.45202%	27.997	
	CP Waiting	0.3782	0.02626%	0.506	
	Total	**21.3 minutes**	**1.48%**	**28.5 minutes**	**1.98%**

Three possibilities (or Scenarios) could occur regarding the ability for WFPS to access the Development:

- Scenario 1 – one of the grade level crossings is blocked.
- Scenario 2 – two of the grade level crossings are blocked.
- Scenario 3 – all three grade level crossings are blocked.

A summary of the rail operations analysis findings for the three scenarios are provided in **Table 7**.

Table 7: Findings of Rail Operations Analysis for Three Scenarios of Blocked Crossings – Year 2030

Scenarios	% Time Occupied or % Chance of being Blocked (Year 2030)	Probability that the Crossing(s) will be Accessible (Year 2030)
Scenario 1 - One Crossing Blocked.	9.27%	90.73%
Scenario 2 - Two Crossings Blocked at the same time.	0.277%	99.723%
Scenario 3 - Three Crossings Blocked at the same time.	0.00263%	99.997%

Currently, there are two existing grade level crossings that WFPS can utilize to access existing lands north and south of Marion Street that are bordered by CN and CP. Inherently, the risk of having both the CP and CN Marion Street crossings being blocked at the same time = 3.45% x 1.98% = 0.068% or 99.932% chance that both crossings will be accessible.

As shown in **Table 7**, the risk having no access to existing lands and the Development is 0.00263%. By increasing the number of grade level crossings from two to three, there is a potential net improvement of:

= (0.068 – 0.00263)/0.068 = 96% improvement in accessibility.

4.0 Fire and Paramedic Response Analysis

The WFPS is a full-time, fully integrated fire and emergency medical services (EMS) department, serving the City. The following analysis considers the emergency response of WFPS to the proposed Development and analyzes the potential impacts to response times of various rail crossing blockage scenarios.

4.1 Projected Calls for Emergency Services

Due to the confidential nature of detailed emergency call data, including residential address and personal information, WFPS was unable to provide a detailed dataset of historic calls to support this analysis. Therefore, projected calls for emergency services to the proposed future development were estimated based on publicly available information. The WFPS 2019 preliminary operating and capital budgets document, dated March 8, 2019, was used as a source of historic annual call volumes within the City. From that document, the 2018 WFPS total call volume was estimated at 111,500, including an estimated 90,000 medical calls and approximately 21,500 fire calls. Based on the City's population of 705,244, the City experienced 0.158 total calls per person, 0.128 medical calls per person and 0.03 fire calls per person.

The population of the proposed development is estimated at 2,000 people, assuming 1.67 people per unit for 1,200 units at full build-out. Using this site population estimate and the city-wide per-person estimate for total emergency calls, it is predicted that there would be 316 emergency calls (255 medical and 61 fire) per year or 0.87 calls per day to the Development.

Therefore, there is an 87% chance each day that there will be an emergency call from within the Development that will require WFPS to be dispatched. This would consist of 255 medical calls and 61 fire calls per year based on an estimated residential population of 2,000 people – 1.67 persons per unit with 1,200 residential units.

4.2 Fire and Paramedic Services Response Analysis

4.2.1 Methodology

The emergency response analysis utilizes Esri's Network Analyst extension, a Geographic Information Systems (GIS) tool developed specifically for the purpose of assessing road networks. GIS files representing the road network in the City were obtained from the Government of Canada's Open Topographical Data of Canada – CanVec Series. The road network data attributes include road classification information which was used to calibrate the model to simulate emergency response travel. The calibration process is important to simulate the actual travel times of responding emergency vehicles. Typically, fire and emergency services vehicles observe roadway speed limits, as well as

respond to incidents. For emergency calls, the responders use lights and sirens on the apparatus to gain priority along roadways; however, they still have to slow down to speeds below the speed limit for traffic control devices (e.g., stop signs/traffic lights) and in areas of traffic congestion. Therefore, the average speed of responding vehicles along the entire route from the station to the emergency scene is typically less than the posted speed limit.

Using actual travel times achieved by the fire and emergency services during historic call experience is a common way to calibrate a road-based model to represent a specific fire and emergency services' local response capabilities. As noted in the section above, WFPS was unable to provide historic call data for use within the Study, due to the confidential nature of the details contained within emergency call data. In lieu of access to the WPFS' historic call data, which would provide a city-specific calibration method, we researched an applicable city and emergency services department to apply as a 'proxy' to calibrate the road network within the GIS model. This is a more accurate and conservative manner of predicting emergency response coverage than relying on models that reflect posted speed limits or regular vehicular traffic patterns (e.g., peak hour traffic models).

One of the key factors influencing emergency response travel times is traffic congestion conditions within the municipality. According to the 2019 TomTom Traffic Index Rating [8] for Canada, the City, with a population of approximately 705,000, has a 22% congestion level, placing it as the seventh most congested city in Canada out of the 12 cities included within the TomTom listings. The City of London, Ontario, with a population of approximately 405,000, was ranked the sixth most congested city in Canada with a 23% congestion level. We believe this indicates that the congestion experienced in the City is comparable to that experienced in the City of London. Based on previous modelling of fire and emergency services within the City of London, Dillon was able to apply the calibrated travel speeds experienced by the London Fire Department as a base to model the travel response times of the WFPS. The calibrated speeds applied to the model are presented in **Table 8**.

Table 8: Emergency Response Calibration by Road Classification

Road Classification	Calibrated Speed (kilometres / hour)
Arterial	50
Collector	37
Expressway / Freeway	80
Local Street	24
Ramp	37
Rapid Transit / Resource / Service Lane	24

Based on our experience in assessing fire and emergency services using GIS-based models, we consider this approach to provide a reasonable estimation of emergency response performance for the WFPS.

[8] 2019 TomTom Traffic Index Rating https://www.tomtom.com/en_gb/traffic-index/ranking/?country=CA

The use of Esri 'Network Analyst' tool is supported by industry leading research that recognizes the importance of time in responding to fire and medical emergencies, and the utilization of recognized industry standards to inform the analysis.

4.2.2 Fire and Paramedic Response Performance Measures

The response analysis is conducted with reference to the **National Fire Protection Association's (NFPA's) 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by a Career Fire Departments (2016 Edition**). WFPS staff confirmed that this standard reflects the initial arriving apparatus and initial full alarm assignment performance targets against which the fire paramedic service currently monitors and assesses service delivery within the City.

4.2.2.1 Initial Arriving Company

The ***"initial arriving company"*** performance target included within the NFPA's 1710 standard assesses the emergency response capabilities of the initial arriving company including ***"a minimum of four firefighters arriving on scene within a four minute travel time to fire suppression incidents"***.

4.2.2.2 Initial Full Alarm Assignment

The existing initial full alarm assignment capabilities of the WFPS were compared to the NFPA's 1710 standard for single family dwellings. This performance target aims to achieve ***"Fifteen firefighters arriving on scene within an eight minute travel time to fire suppression incidents"***.

The NFPA's 1710 performance target relating to the arrival of ADVANCED LIFE SUPPORT unit at an emergency incident is an eight minute travel time. This would apply to the WFPS paramedic units. This performance measure assumes that a first responder with an automated external defibrillator or basic life support unit arrived within four minutes of travel time. With the integrated service provided by WFPS, the Initial Arriving Company performance would address this requirement. Paramedic Units (i.e., staffed ambulances) tend to operate from a roaming model, as opposed to a station-based model as fire apparatus do. Therefore, predicting the paramedic unit response using the GIS-based model is more difficult and less reliable. Therefore, this analysis included modelled results for the Initial Arriving Apparatus (within a four minute travel time) and the Initial Full Alarm Assignment (within an eight minute travel time) to the proposed development to assess the emergency response time performance of the WFPS.

4.3 Winnipeg Fire Paramedic Services Background Data

WFPS operates from 30 stations, including three stand-alone EMS stations (Stations 30, 31 and 36). The staffing and apparatus assignment per station, as applied to the emergency response modelling (initial arriving company and initial full alarm assignment analysis) are summarized below in **Table 9**. This

information was provided by WFPS staff and cross-referenced within the Winnipeg Fire Paramedic Service Master Plan and Community Risk Standards of Cover documents.

The full alarm assignment performance is intended to measure effective firefighting force in response to a fire incident in a single-family dwelling. Paramedic Units, Major Incident Response Vehicle (MIRV) and EMS Superintendent were not included within the staffing levels modelled for the initial full alarm assignment response. This is based on our understanding of the WFPS' deployment practices for responding to fire-related emergency calls. The total minimum staffing assigned per station is also summarized in tables embedded within the mapped results for the initial full alarm scenarios.

Table 9: WFPS Stations, Staffed Apparatus and Minimum On-Duty Staffing

Station #	Staffed Apparatus	Minimum On-Duty Staffing
1	Engine 101	4
1	Engine 103	4
1	Ladder 1	2
1	Squad 101	2
1	Squad 102	2
1	Platoon Chief 1	1
1	EMS Superintendent*	1*
1	MIRV*	1*
1	Paramedic Unit 91*	2*
1	Paramedic Unit 31*	2*
2	Engine 2	4
2	Fire Investigator 2	1
2	Paramedic Unit 02*	2*
2	Paramedic Unit 40*	2*
3	Engine 3	4
3	District Chief 3	2
4	Engine 4	4
4	Rescue 4	4
4	District Chief 4	2
5	Engine 5	4
5	Rescue 5	4
5	District Chief 5	2
5	Paramedic Unit 05*	2*
5	Paramedic Unit 92*	2*
6	Engine 6	4
6	Rescue 6	4
6	Squad 6	2
6	Paramedic Unit 06*	2

Station #	Staffed Apparatus	Minimum On-Duty Staffing
7	Engine 7	4
8	Engine 8	4
8	Rescue 8	4
9	Engine 9	4
9	Rescue 9	4
10	Engine 10	4
10	District Chief 10	2
11	Engine 11	4
11	Rescue 11	4
11	Ladder 11	2
11	Paramedic Unit 11*	2*
12	Engine 12	4
12	Paramedic Unit 12*	2*
13	Engine 13	4
13	Ladder 13	2
13	Paramedic Unit 13*	2*
14	Engine 14	4
14	Paramedic Unit 14*	2*
15	Engine 15	4
16	Engine 16	4
16	Ladder 16	2
16	Paramedic Unit 16*	2*
17	Engine 17	4
18	Engine 18	4
18	Paramedic Unit 18*	2*
19	Engine 19	4
20	Engine 20	4
20	Paramedic Unit 20*	2*
21	Engine 21	4
21	Ladder 21	2
21	Paramedic Unit 49*	2*
22	Engine 22	4
22	Paramedic Unit 22*	2*
23	Engine 23	4
23	Engine 231	4
24	Engine 24	4
24	District Chief 24	2
24	Paramedic Unit 24*	2*
25	Engine 25	4
25	Paramedic Unit 25*	2*

Station #	Staffed Apparatus	Minimum On-Duty Staffing
26	Engine 26	4
26	Paramedic Unit 26*	2*
27	Engine 27	4
27	Paramedic Unit 27*	2*
30*	Paramedic Unit 17*	2*
30*	Paramedic Unit 43*	2*
30*	Emergency Program in the Community	1*
31*	Paramedic Unit 01*	2*
31*	Paramedic Unit 41*	2*
31*	Paramedic Unit 45*	2*
36*	Paramedic Unit 36*	2*
*NOTE: * station/apparatus/staff excluded from initial full alarm assignment*		

As requested by WFPS at the data collection process of the Study, the emergency response analysis gives consideration to scenarios which represent maintaining Station 9 in the present location (currently located at 864 Marion Street), as well as the potential future option that Station 9 would be consolidated with another WFPS station and relocated from the present location. These are presented as 'A' and 'B' scenarios respectively within the emergency response analysis and results, as discussed below.

4.4 Fire and Paramedic Response Analysis and Results

This section presents the scenarios assessed and the associated GIS-based results simulating emergency access to the proposed Development by the WFPS with various scenarios of potential rail crossing blockages.

4.4.1 Baseline Response Scenarios (A and B)

The Baseline Response Scenario for fire and emergency services represents the WFPS response to the Development with none of the level crossings blocked. These scenarios include the existing WFPS stations, geo-located within the GIS model. The initial arriving company was assumed to be travelling to the proposed Development from the stations that house fire and paramedic staff and apparatus, which are closer to the proposed development than the stand-alone EMS stations that house ambulance/medical response units only. The site-specific proposed road network (shown as purple "proposed road" lines on the site-specific response mapping, such as **Figures 7** and **8**) was added to the city-wide calibrated road network.

The baseline conditions assume that all three proposed site accesses are available, with no restrictions from rail operations. **Baseline Response Scenario A**' includes the existing Station 9 and '**Baseline Response Scenario B**' assumes the consolidation of Station 9. This labelling convention is carried forward through the subsequent scenarios.

The Baseline Response Scenarios are assessed against both the **initial arriving company** performance target (i.e., four firefighters arriving on-scene within four minutes of travel time), as well as the **initial full alarm assignment** performance target (i.e., 15 firefighters arriving on-scene within eight minutes of travel time).

The city-wide results of the **initial arriving company** emergency response for **Baseline Response Scenario A** are shown in **Figure 5** and for **Baseline Response Scenario B** are shown in **Figure 6**.

With the number and spacing of the existing WFPS stations, the results indicate that the City is well-covered within the four minute initial arriving company target travel time. Calculations provided within **Baseline Response Scenario A** identify that the model predicts 55% of the City's area can be reached within four minutes or less of travel time, 88% of area can be reached within eight minutes of travel time or less; therefore, 12% of the city-wide area is modelled to experience a travel time of greater than eight minutes. The consolidation of Station 9 is shown to impact the response times to the development north of Station 9 west of Panet Road, as well as southeast of Station 9, along the boundary of the City between Fermor Avenue and Dugald Road.

Regarding the modelled results that indicate 55% of the City's area can be reached within four minutes or less of travel time, it is important to note that modelled area coverage is different that call coverage (which the NFPA's 1710 performance benchmark measures – 90% of incidents). The Winnipeg Fire Paramedic Services Master Plan document presents two heat maps (located on pages 4 and 5 of the Master Plan's Executive Summary), which illustrates that the highest concentration of calls, both EMS and fire, occurring in the core of the City and the density of calls decreases towards the City's boundary. Therefore, within 55% of the City's covered area shown within the **City-Wide Baseline Scenario A** (**Figure 5**), the percentage of calls covered would be a much higher amount. The WFPS's Community Risk Assessment: Standards of Cover document also includes a Distribution Analysis that indicates nearly 97% of emergency service calls were modelled to occur within a four minute travel time of a fire station; however, the actual 90th percentile travel time for the Initial Arriving Company in 2016 was 5 minutes and 2 seconds, and only 72% of emergency calls were responded to within four minutes or less of travel time[9]. In our experience, a call coverage of 72% of emergency calls is more consistent with the level of service municipalities across Canada receives than 97%. Based on our experience, a call coverage in the high 90% range is considered rare.

[9] Source: Winnipeg Fire Paramedic Service's Community Risk Assessment: Standards of Cover, Travel Time, page 157

Figure 5: Baseline Response Scenario A City-Wide Initial Arriving Company Results

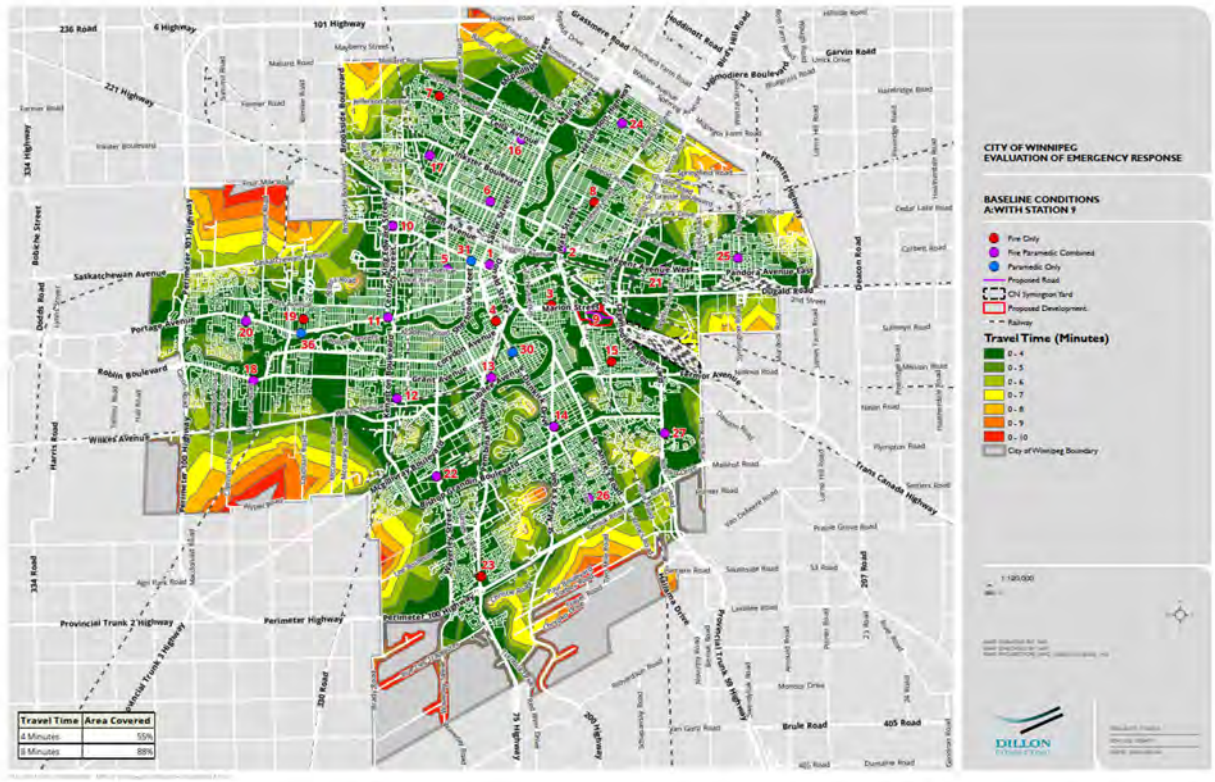
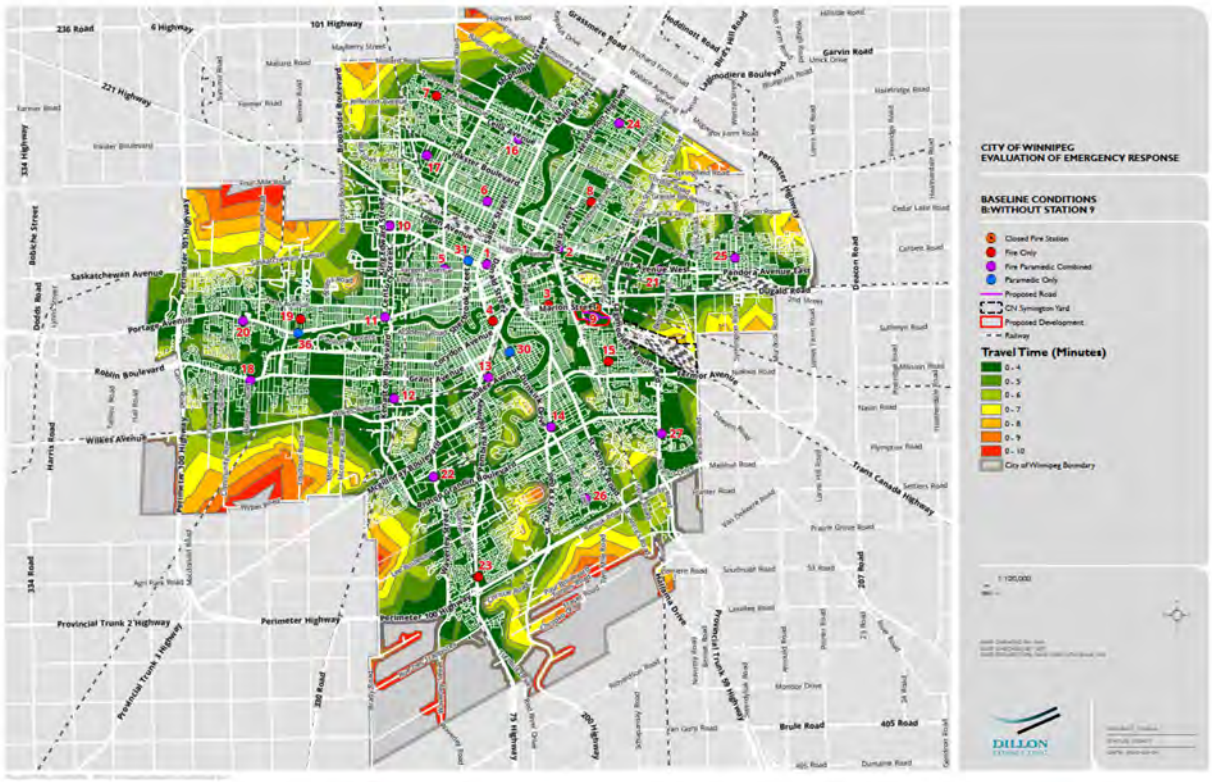


Figure 6: Baseline Response Scenario B City-Wide Initial Arriving Company Results


CITY OF WINNIPEG
EVALUATION OF EMERGENCY RESPONSE
BASELINE CONDITIONS
B:WITHOUT STATION 9
Closed Fire Station
Fire Only
Fire Paramedic Combined
Paramedic Only
Proposed Road
CN Symington Yard
Proposed Development
Railway
Travel Time (Minutes)
0 - 4
0 - 5
0 - 6
0 - 7
0 - 8
0 - 9
0 - 10
City of Winnipeg Boundary
1:125,000
DILLON
236 Road
6 Highway
101 Highway
221 Highway
334 Highway
Saskatchewan Avenue
Portage Avenue
Robin Boulevard
Wilkes Avenue
Provincial Trunk 2 Highway
Perimeter Highway
Provincial Trunk 1 Highway
Trans Canada Highway
Brule Road
405 Road
Garvin Road
Grassmere Road
Waverley Street
Dakota Road
Dugald Road
Dawson Road
Brookside Boulevard
Lagimodiere Boulevard
Bishop Grandin Boulevard
Pandora Avenue East
Regent Avenue
Marion Street
Fermor Avenue
Harris Road
Dodds Road
Brookside Street
St Mary's Road
Main Street
St Anne's Road
Provincial Trunk 59 Highway
Lagimodiere Drive
Murdock Road
Prairie Grove Road
Settlers Road
Plymouth Road
Nairn Road
Hamelin Road
Lyncrest Road
Sutherland Road
Cartier Road
Cedar Lake Road
Perimeter Highway
Perimeter Highway
Perimeter Highway

Figures 7 and **8** present the site-specific mapped results of the **Baseline Response Scenario A** and **Baseline Response Scenario B initial arriving company** results. The grade level crossing analyzed within the scope of work is visible within the details of the site-specific figures, as are the proposed roads within the development and the surround rail lines. As shown in these figures, under baseline conditions, the proposed development is serviced entirely within a four minute travel time under both **Baseline Response Scenario A**, with Station 9 in place, and **Baseline Response Scenario B**, with Station 9 assumed to be consolidated. It is important to note that the Network Analyst GIS tool used to prepare the fire and emergency response models assumes that land parcels adjacent to the roads represent the same travel time as on the roadway itself. Therefore, areas such as those immediately east of Archibald Street, on the west side of the proposed development, indicate four minutes of travel time coverage even though there is no direct road access from Archibald Street to the land immediately east and the rail line travels parallel to Archibald Street in this area. This is due to the methodology that the Network Analyst tool applies.

Figure 7: Baseline Response Scenario A Site-Specific Initial Arriving Company Results

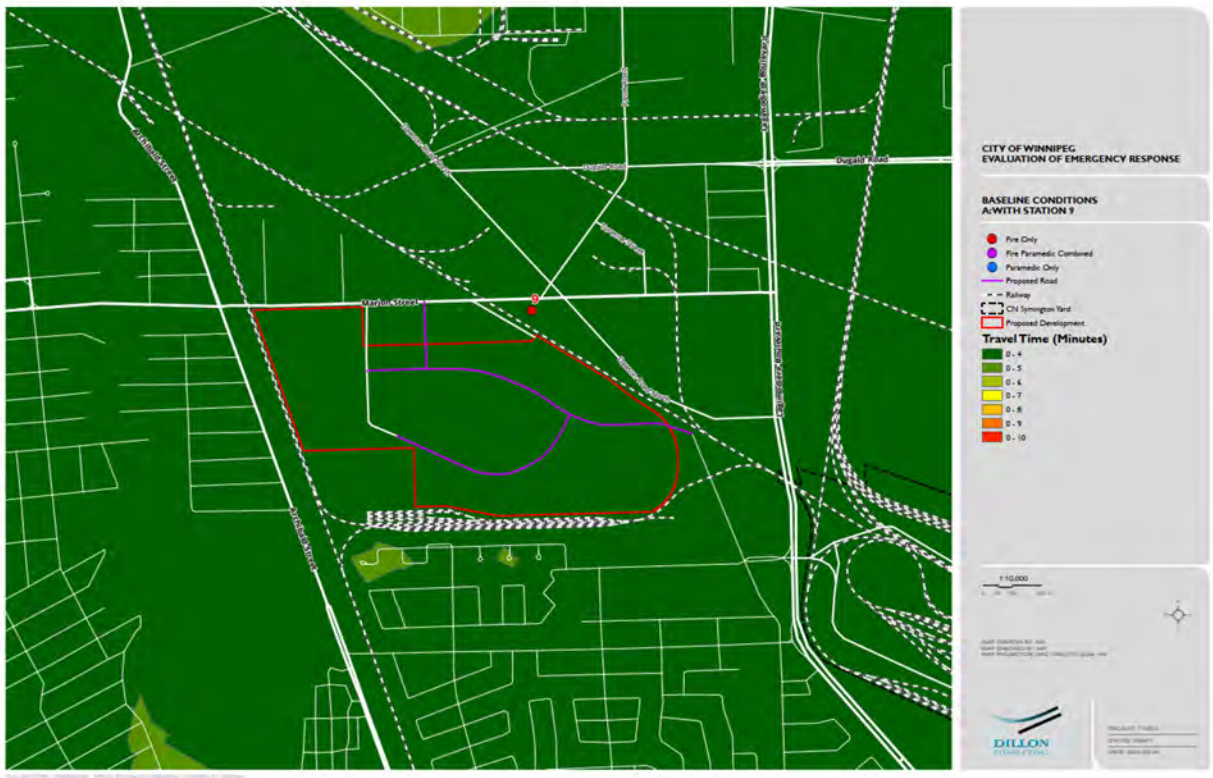
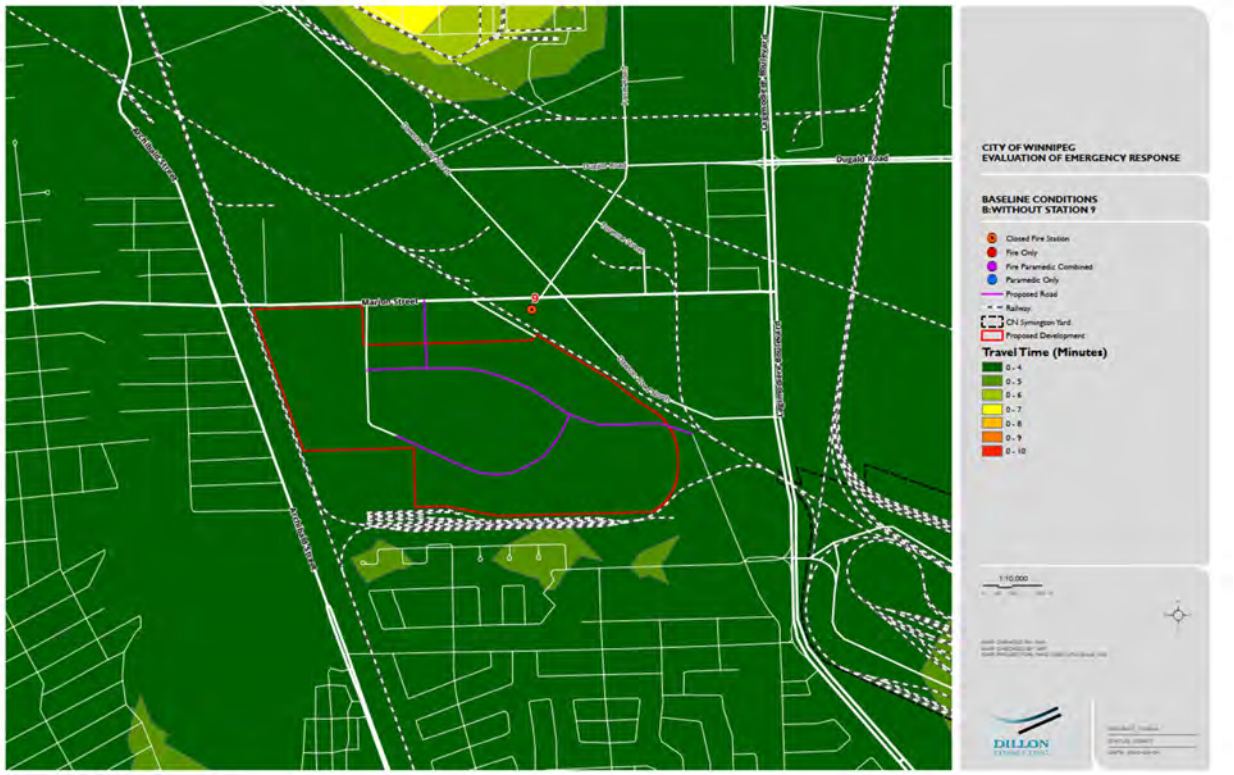


Figure 8: Baseline Response Scenario B Site-Specific Initial Arriving Company Results



The city-wide results of the **initial full alarm assignment** emergency response for **Baseline Response Scenario A** are shown in **Figure 9** and for **Baseline Response Scenario B** are shown in **Figure 10**.

Under the existing conditions of WFPS stations and staffed fire apparatus deployed to a fire-related incident, the visual results indicate that the City is well-covered when measured against the initial full alarm assignment performance target. Calculations provided within **Baseline Response Scenario A** identify that 15 firefighters are predicted to reach 60.2% of the City's geographical area within the eight minute initial full alarm assignment target travel time.

As discussed within **Section 4.4.1** above, this would likely translate to higher call coverage, based on the distribution of calls within the City being most dense towards the City's centre and getting less dense towards the City's boundary. Calculations provided within **Baseline Response Scenario B** identify that 15 firefighters are predicted to reach 58.8% of the City's geographical area within the eight minute initial full alarm assignment target travel time.

This reduction is as a result of the station consolidation. The consolidation of Station 9 is shown to impact the depth of response to the area directly north of the CN Symington Yard, with the coverage changing from eight firefighters or more to less than eight firefighters within the eight minutes of measured travel time. Following the completion of our analysis, we were provided with the insight that

in the event of the consolidation of Station 9, the staff and apparatus would be relocated to Station 15. The presented model has simply removed the Station 9 staff and apparatus as opposed to relocating them, which is a conservative assumption. We anticipate that relocating the staff and apparatus from Station 9 to 15 would likely maintain the initial full alarm assignment coverage shown in **Baseline Response Scenario A**.

Figure 9: Baseline Response Scenario A City-Wide Initial Full Alarm Assignment Results

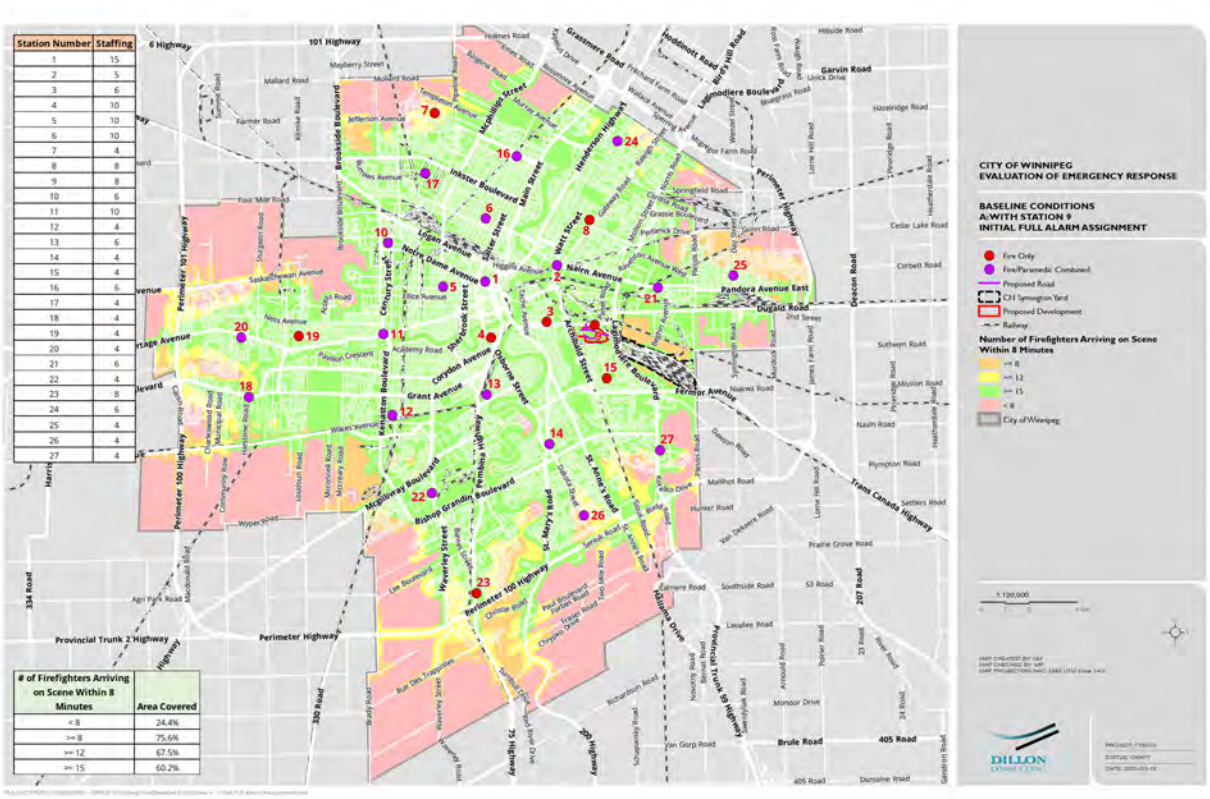
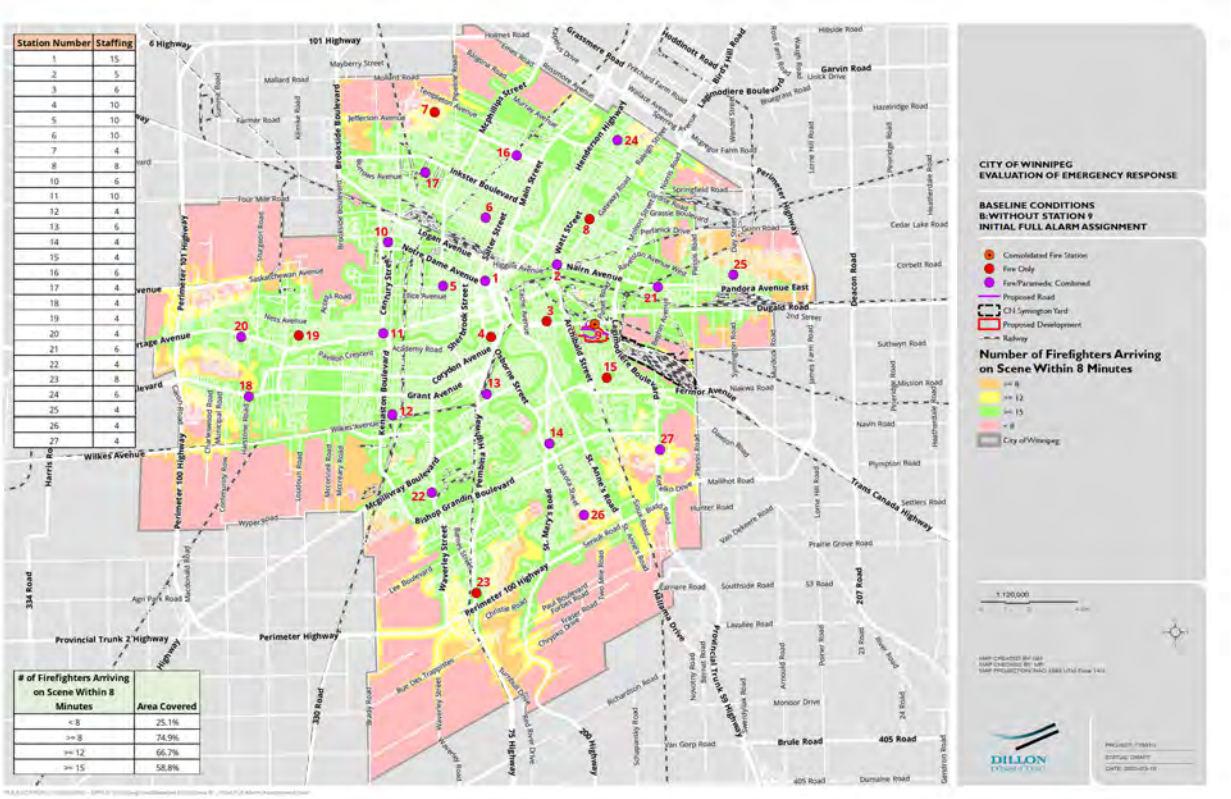


Figure 10: Baseline Response Scenario B City-Wide Initial Full Alarm Assignment Results



Figures 11 and **12** present the site-specific mapped results of the **Baseline Response Scenario A** and **Baseline Response Scenario B initial full alarm assignment** results. As shown in these figures, under baseline conditions, the proposed Development is serviced entirely with 15 firefighters or more arriving within an eight minute travel time. This coverage occurs under both **Baseline Response Scenario A**, with Station 9 in place, and under **Baseline Response Scenario B**, with Station 9 assumed to be consolidated. The change in predicted coverage to the area north of the CN Symington Yard is indicated on the right side of the site-specific figures. This is discussed above in the city-wide initial full alarm assignment results.

A summary of the Baseline Scenario Analysis is included below in **Table 10**.

Figure 11: Baseline Response Scenario A Site-Specific Initial Full Alarm Assignment Results

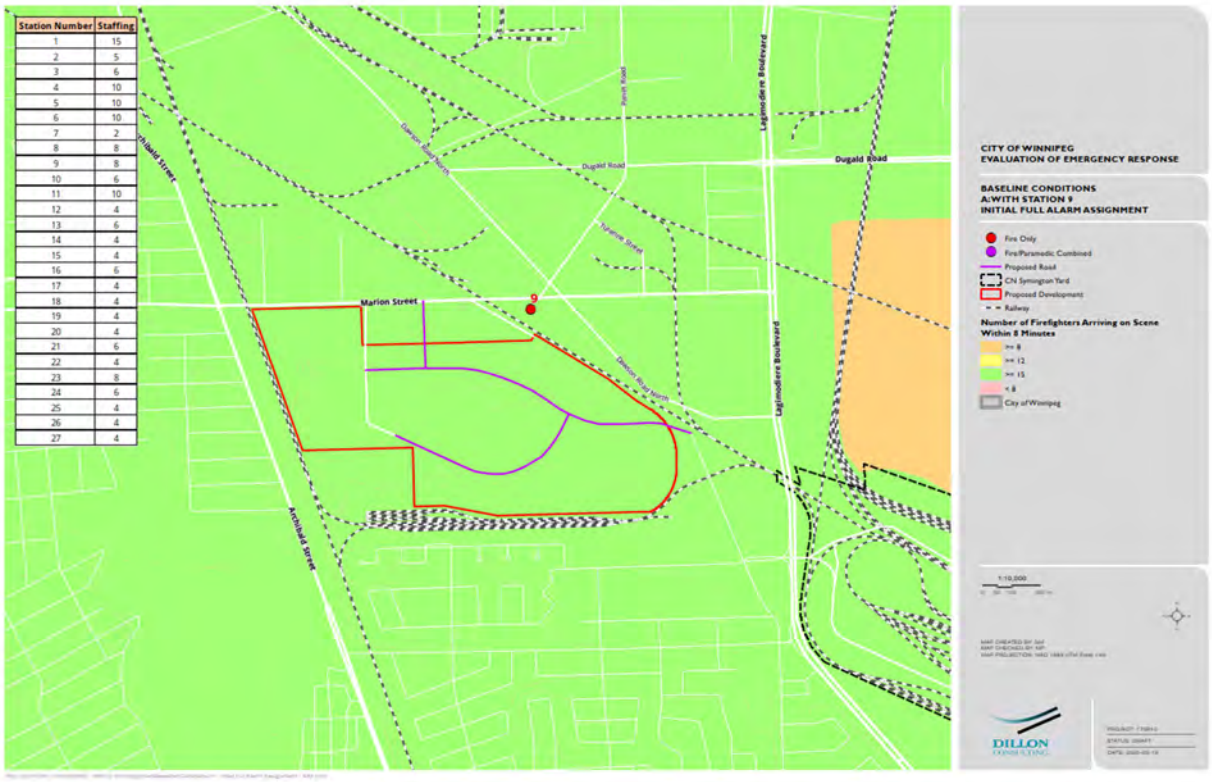


Figure 12: Baseline Response Scenario B Site-Specific Initial Full Alarm Assignment Results

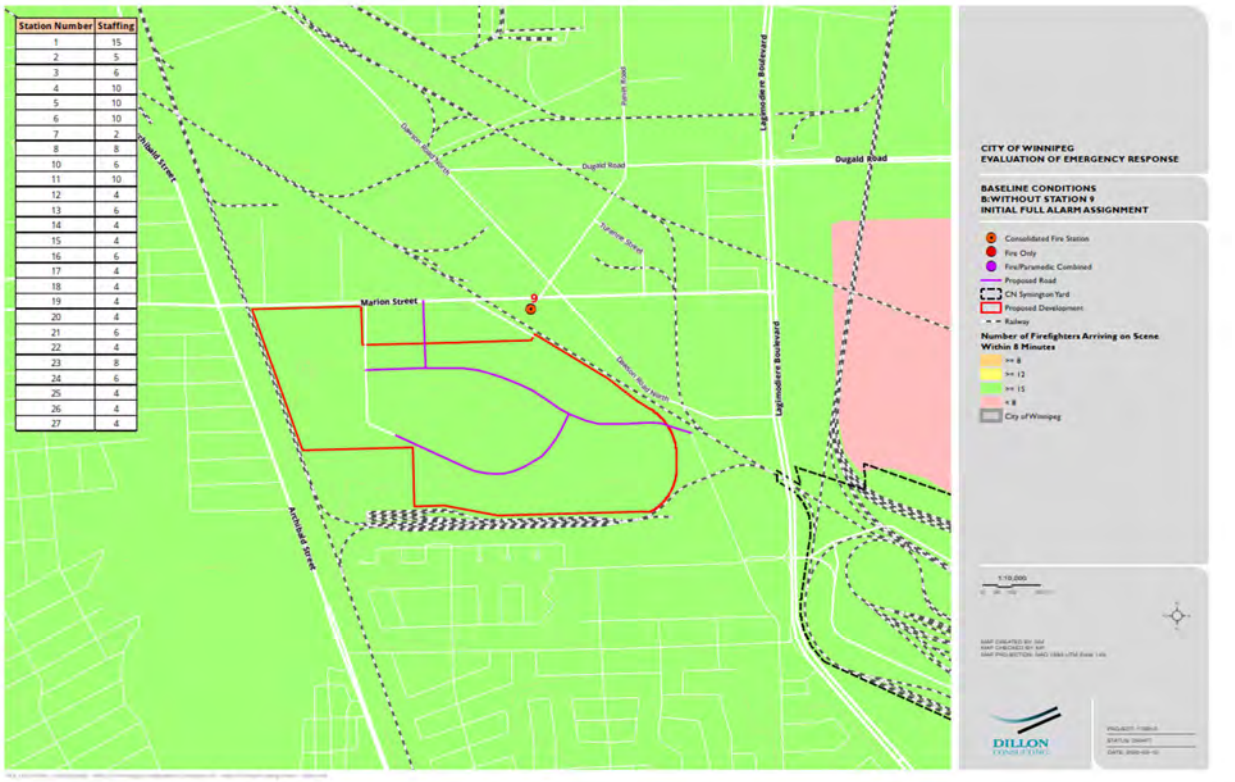


Table 10: Summary of Baseline Response Scenario Results

Scenario	Performance Target	Results
Baseline Scenario A (City-Wide) Existing station locations and staffed apparatus, including Station 9. Results displayed for the entire City. All three crossings open and accessible. Provides a baseline from which to measure of the impacts on service of scenarios including blocked crossings.	Initial Arriving Company	55% of the City's area covered with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	60.2% of the City's area covered with 15 firefighters responding in 8 minutes of travel time.
Baseline Scenario B (City-Wide) Existing station locations and staffed apparatus, excluding Station 9. Results displayed for the entire City. All three crossings open and accessible. Provides a baseline from which to measure of the impacts on service of scenarios including blocked crossings.	Initial Arriving Company	The coverage achieved is very similar to that shown in Baseline Scenario A.
	Initial Full Alarm Assignment	58.8% of the City's area covered with 15 firefighters responding in 8 minutes of travel time or less.[10]
Baseline Scenario A (Site-Specific) Existing station locations and staffed apparatus, including Station 9. Results displayed for the area of the proposed development. All three crossings open and accessible. Provides a baseline from which to measure of the impacts on service of scenarios including blocked crossings.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
Baseline Scenario B (Site-Specific) Existing station locations and staffed apparatus, excluding Station 9. Results displayed for the area of the proposed development. All three crossings open and accessible. Provides a baseline from which to measure of the impacts on service of scenarios including blocked crossings.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.

4.4.2 Response Scenario of One Rail Crossing Blocked (A and B)

These scenarios represent a simulation of one of the three grade-level crossings being blocked; therefore, impacting the WFPS from responding to the site via one of the three site access points. As stated in **Table 15: Results of Conditional Probabilities for Grade Crossing Blockage Scenarios**, there is only a 8.07% chance that one of the level crossings would be blocked during an emergency call on the site. This translates to a 91.933% chance that at least two grade level rail crossings will be open during an emergency call within the proposed development.

One Blocked Crossing Scenario A1 represents conditions with the CP Marion crossing being blocked and the response conditions include existing Station 9. WFPS staff indicated that the CP Marion Street

[10] The analysis in this Study excluded Station 9 staff and apparatus from all Scenario 'B's. Redeploying the staff and apparatus to another station would potentially resolve any differences in the initial full alarm assignment results between Baseline Scenario A and B.

crossing and the most western Marion Street site access point is considered a main access for fire and emergency services response. The results of the initial arriving company analysis are shown below in **Figure 13** and the results of the initial full alarm assignment are shown in **Figure 14**. With this crossing blocked, WFPS would still be able to reach the entire Development with an initial arriving apparatus within four minutes of travel time and would still be able to assemble an initial full alarm assignment of 15 firefighters within eight minutes of travel time.

One Blocked Crossing Scenario B1 represents conditions with the CP Marion crossing being blocked and Station 9 being consolidated. The results of the initial arriving company analysis are shown below in **Figure 15** and the results of the initial full alarm assignment are shown in **Figure 16**. With this crossing blocked and Station 9 consolidated, WFPS would reach the Development with an initial arriving apparatus within four to five minutes of travel time, experiencing as much as a one minute delay to approximately half of the site. In this scenario, WFPS would still be able to assemble an initial full alarm assignment of 15 firefighters within eight minutes of travel time.

Figure 13: One Blocked Crossing Scenario A1 – Initial Arriving Company

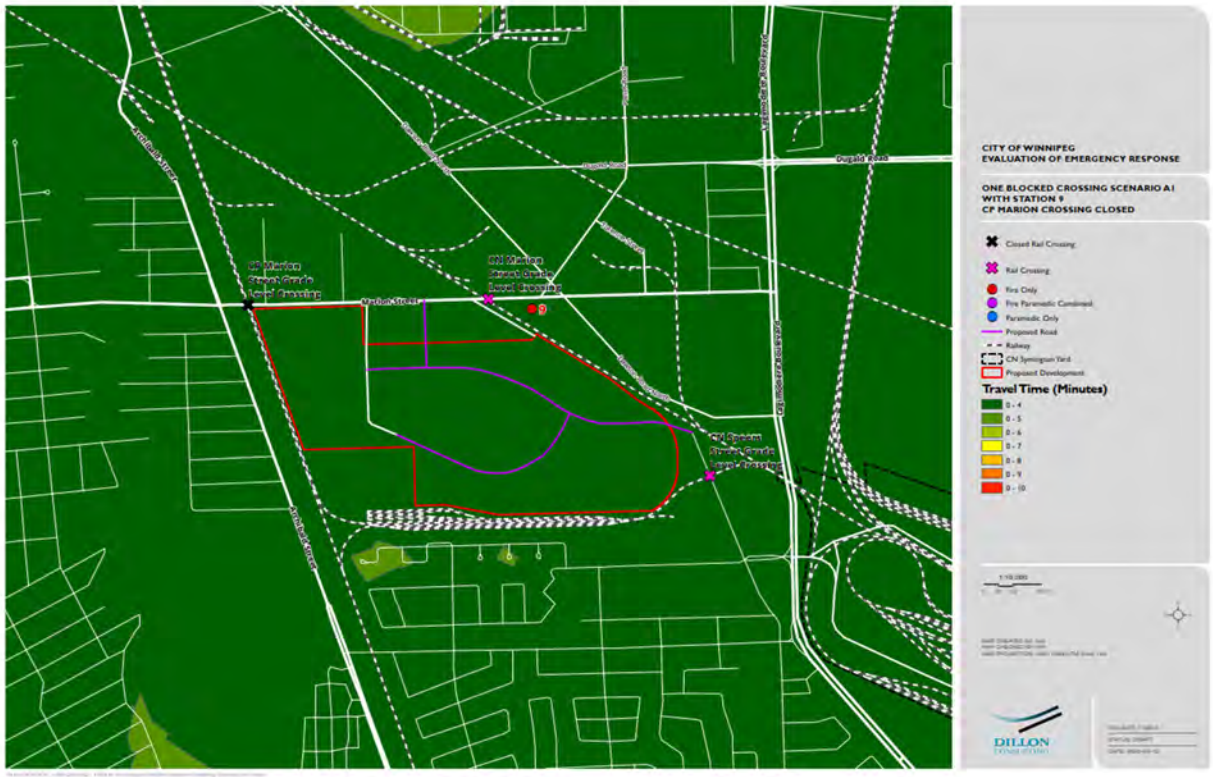


Figure 14: One Blocked Crossing Scenario A1 - Initial Full Alarm Assignment

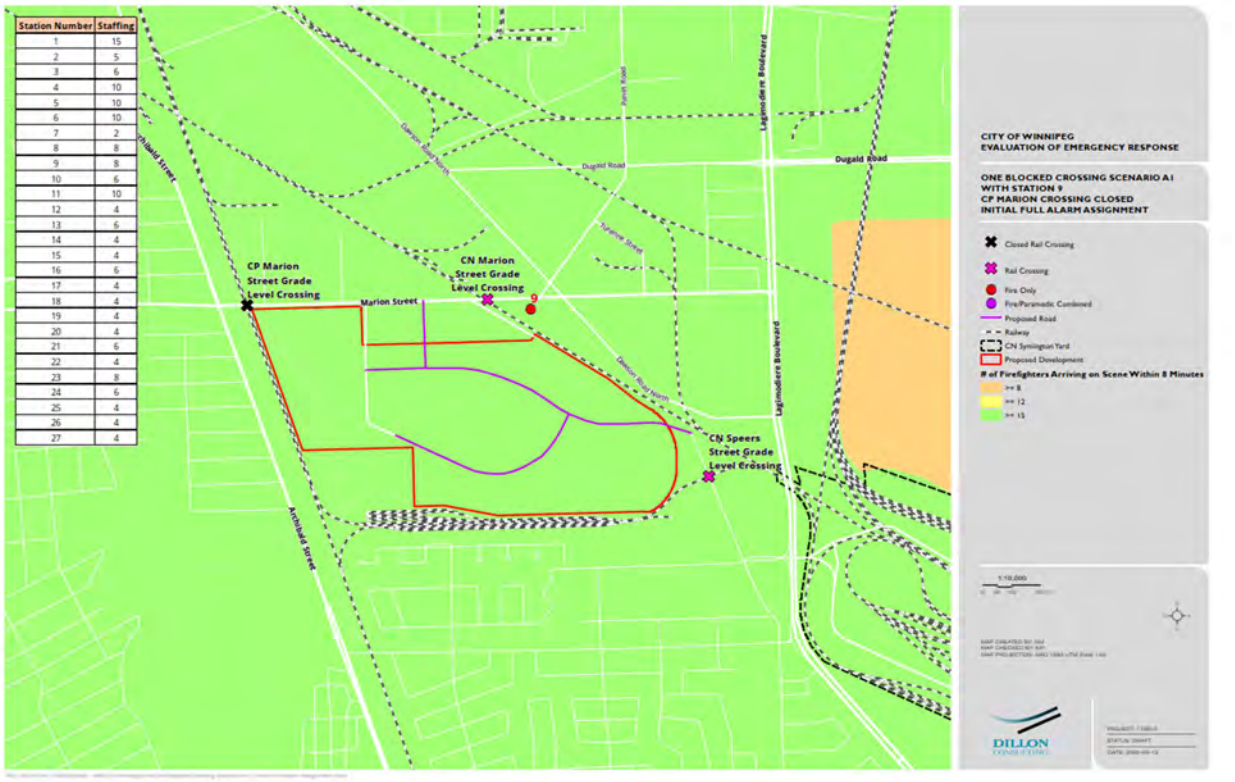


Figure 15: One Blocked Crossing Scenario B1 – Initial Arriving Company

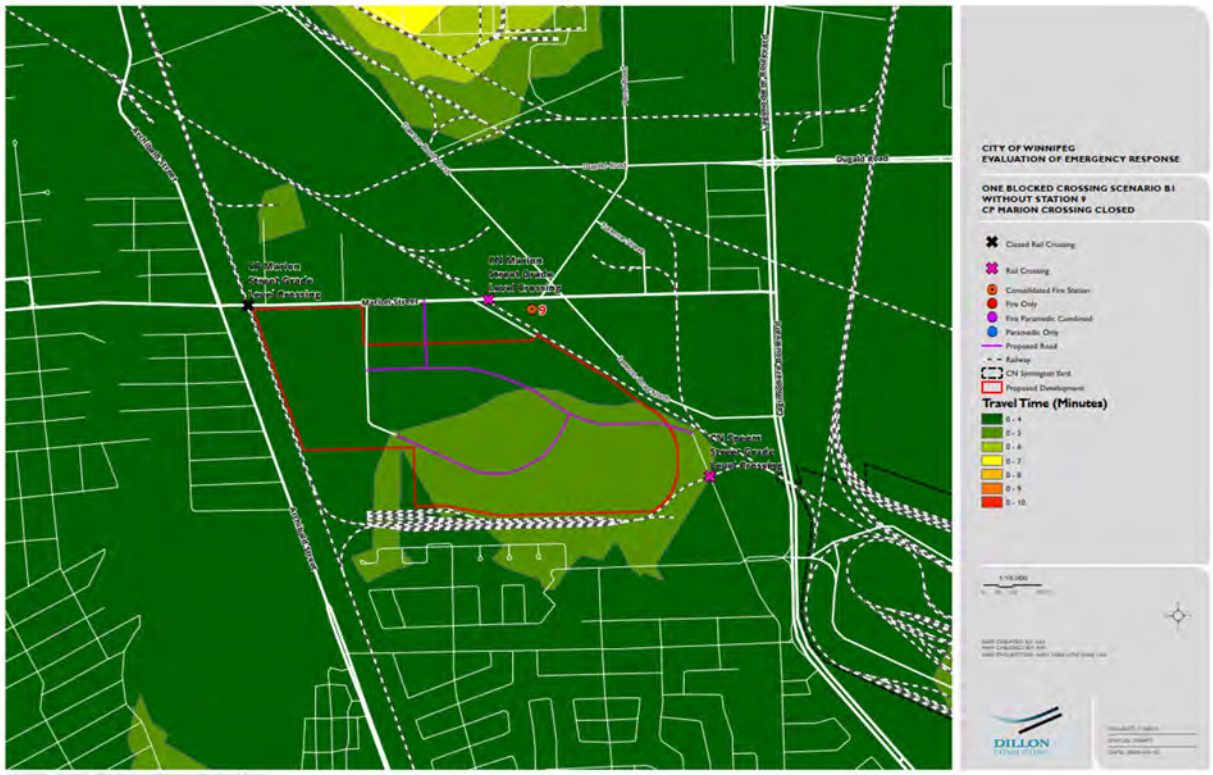
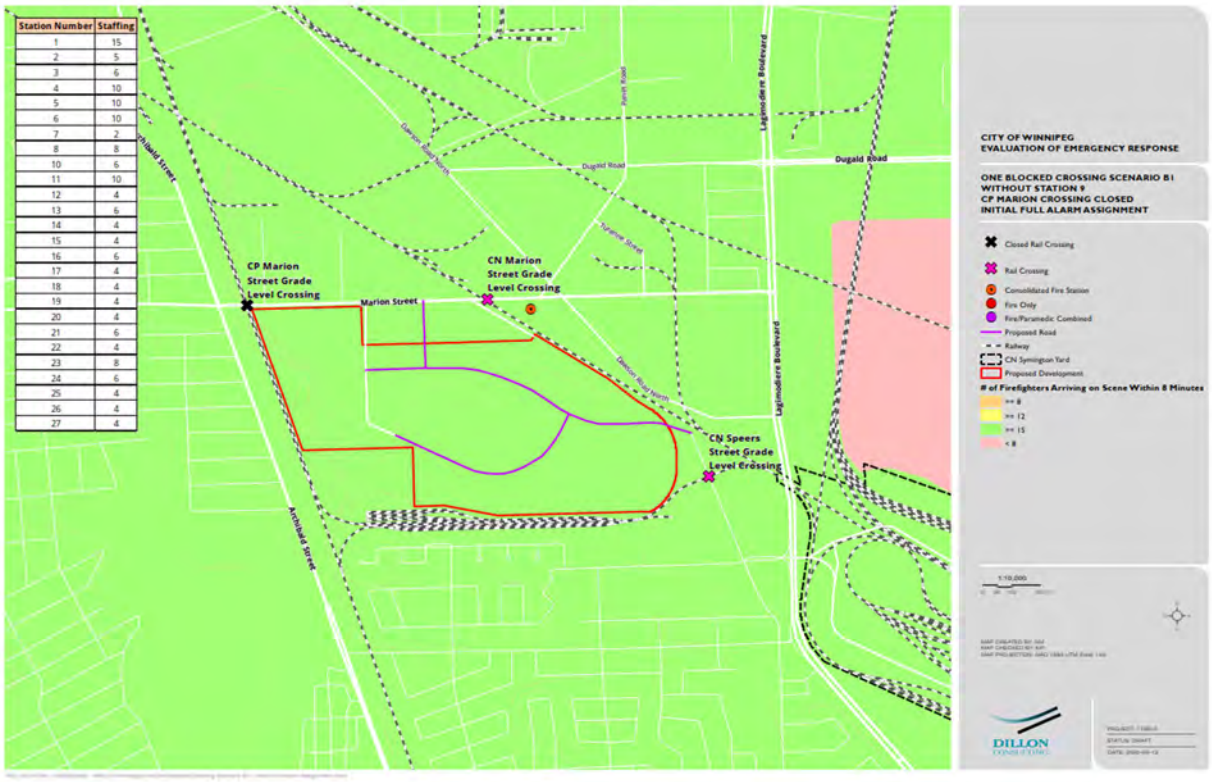


Figure 16: One Blocked Crossing Scenario B1 - Initial Full Alarm Assignment Results



One Blocked Crossing Scenario A2 represents conditions with the CN Marion crossing being blocked and Station 9 remaining in the existing location. The results of the initial arriving company analysis are shown below in **Figure 17** and the results of the initial full alarm assignment are shown in **Figure 18**. As indicated within the figures displaying the results, with this crossing blocked WFPS would still be able to reach the entire Development with an initial arriving apparatus within four minutes of travel time and would still be able to assemble an initial full alarm assignment of 15 firefighters within eight minutes of travel time.

One Blocked Crossing Scenario B2 represents conditions with the CN Marion crossing being blocked and Station 9 being consolidated. The results of the initial arriving company analysis are shown below in **Figure 19** and the results of the initial full alarm assignment are shown in **Figure 20**. As indicated within the figures displaying the results, with this crossing blocked WFPS would still be able to reach the entire Development with an initial arriving apparatus within four minutes of travel time and would still be able to assemble an initial full alarm assignment of 15 firefighters within eight minutes of travel time.

Figure 17: One Blocked Crossing Scenario A2 – Initial Arriving Company Results

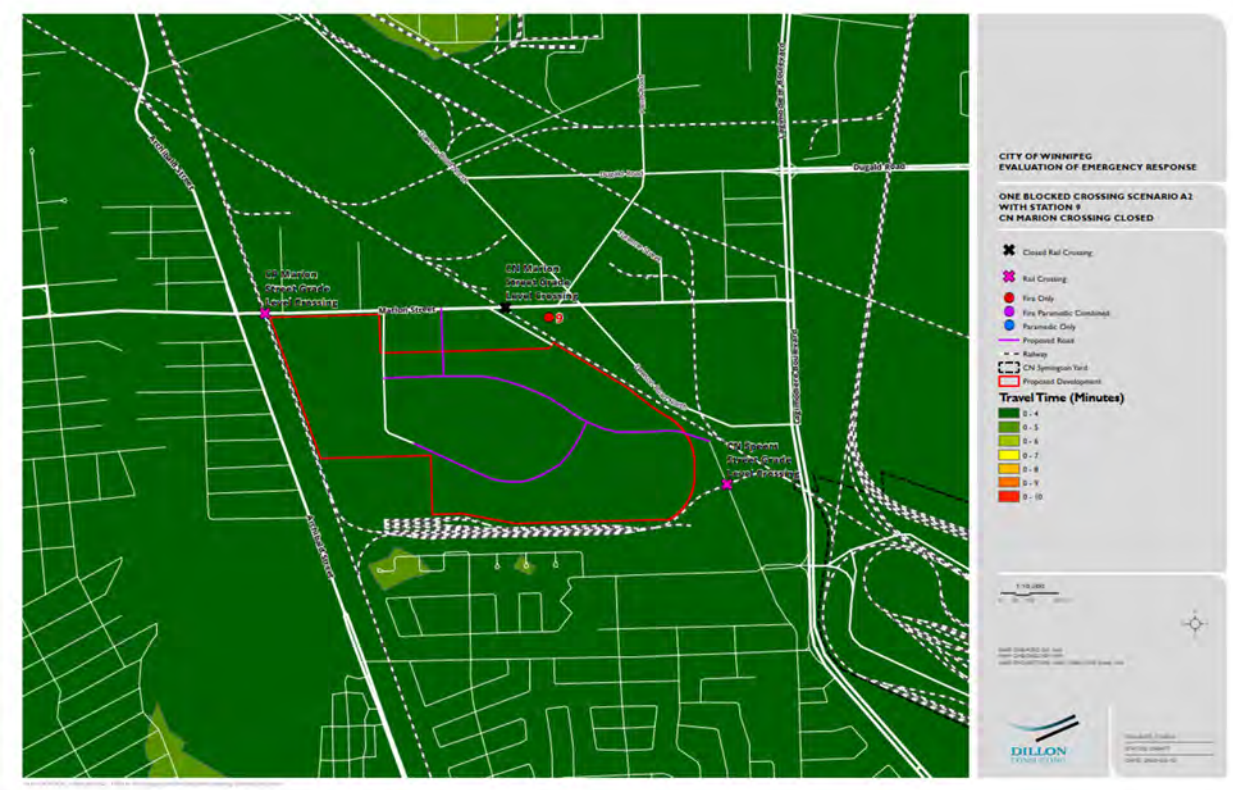


Figure 18: One Blocked Crossing Scenario A2 - Initial Full Alarm Assignment Results

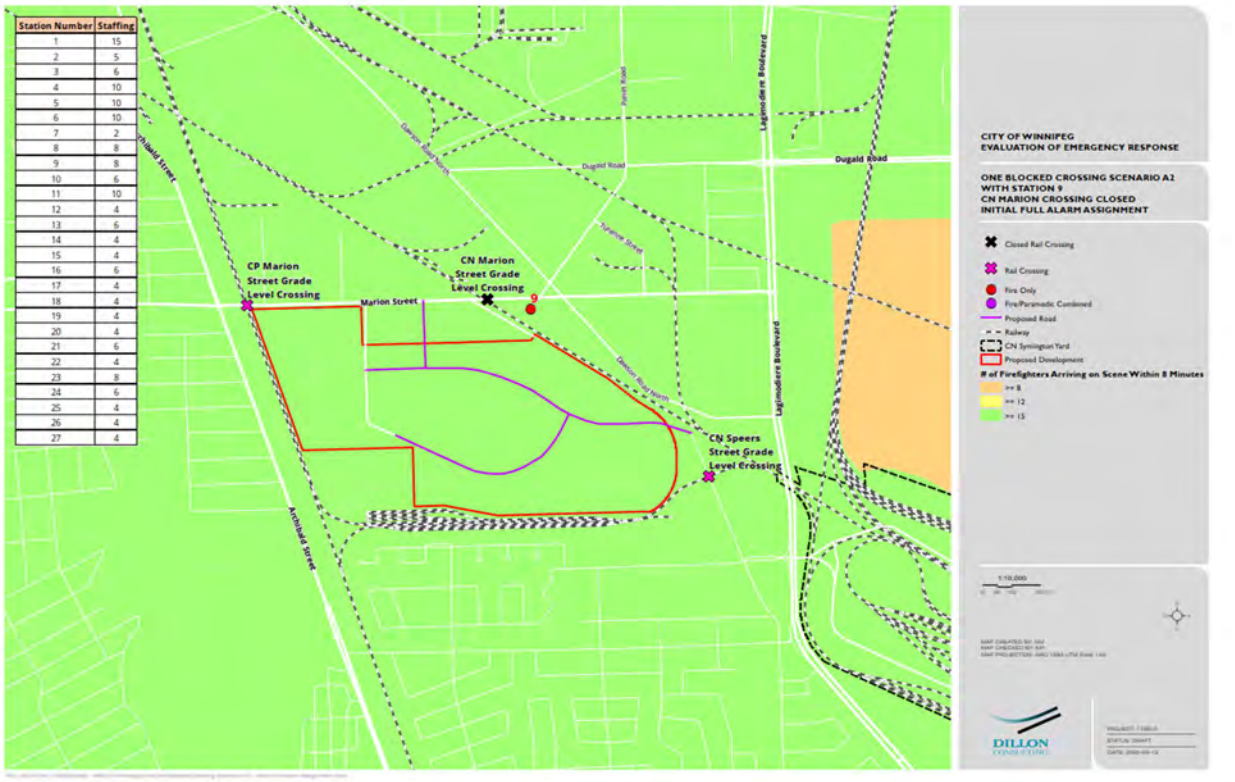


Figure 19: One Blocked Crossing Scenario B2 – Initial Arriving Company Results

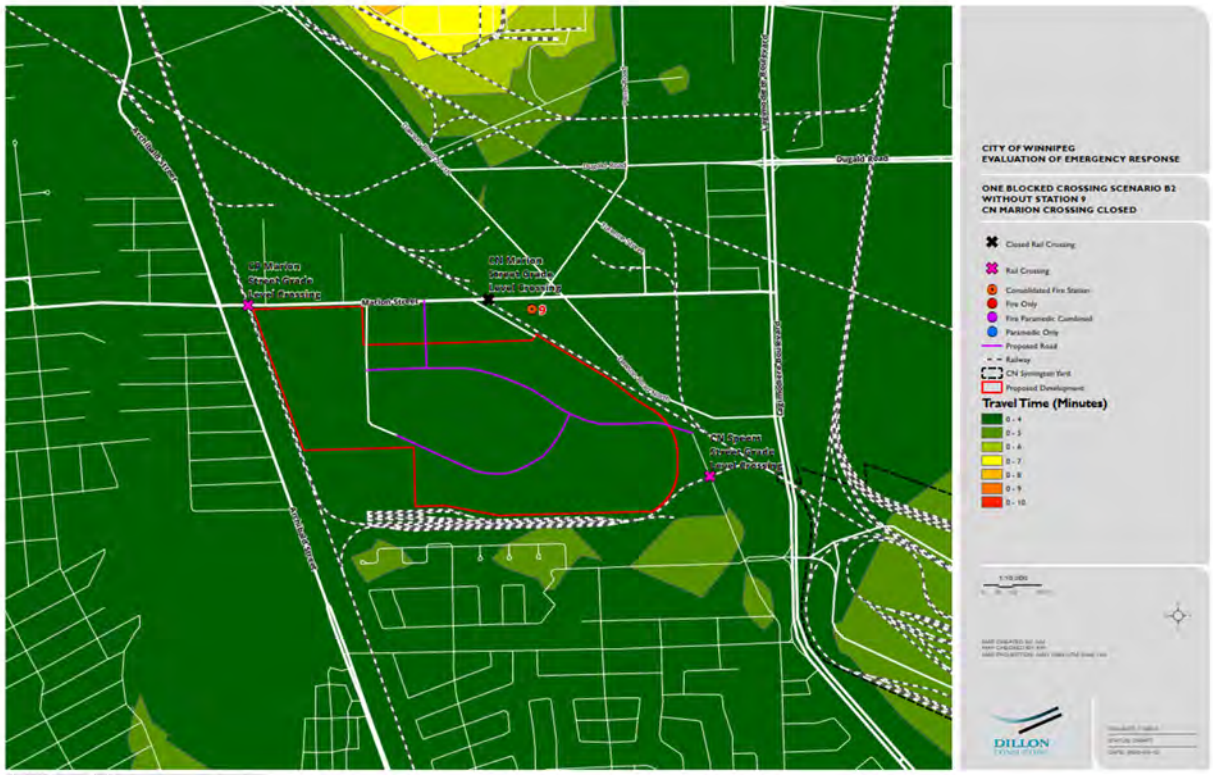
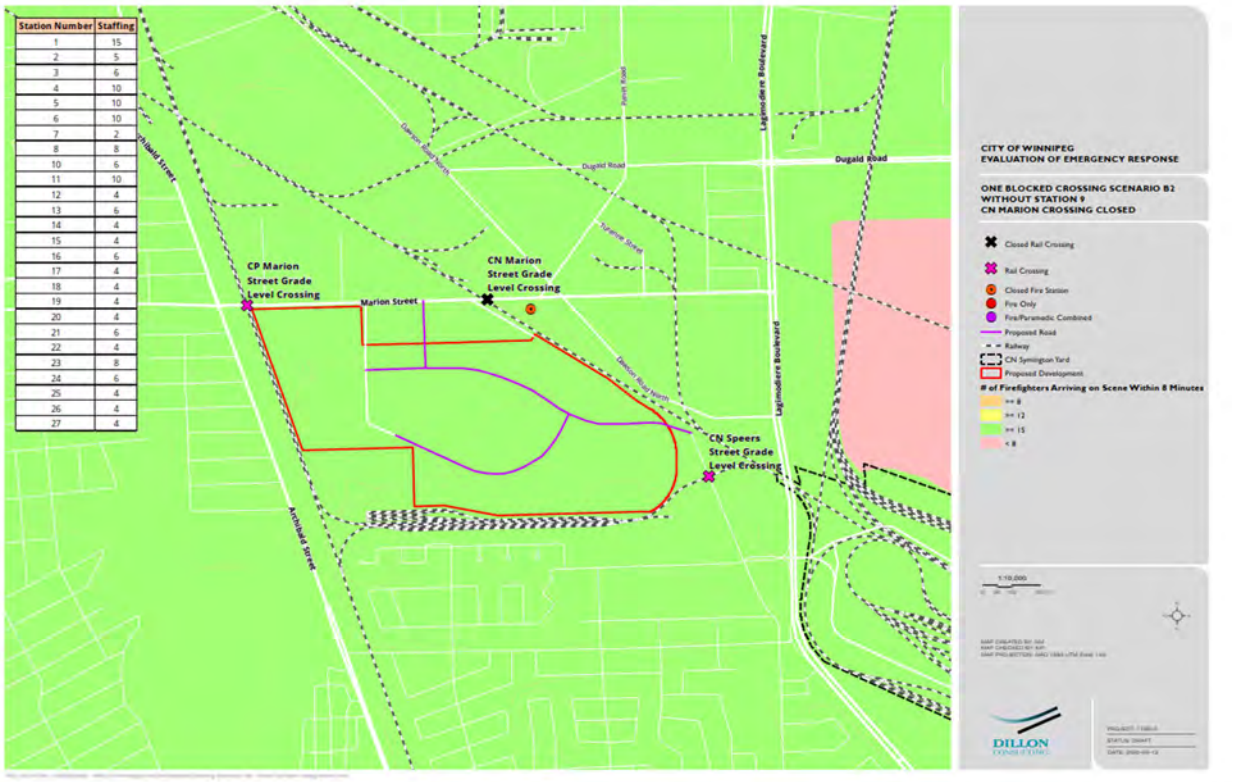


Figure 20: One Blocked Crossing Scenario B2 - Initial Full Alarm Assignment Results



One Blocked Crossing Scenario A3 represents conditions with the CN Speers crossing being blocked and Station 9 remaining in the existing location. The results of the initial arriving company analysis are shown below in **Figure 21** and the results of the initial full alarm assignment are shown in **Figure 22**. As indicated within the figures displaying these results, with this crossing blocked, WFPS would still be able to reach the entire Development with an initial arriving apparatus within four minutes of travel time and would still be able to assemble an initial full alarm assignment of 15 firefighters within eight minutes of travel time.

One Blocked Crossing Scenario B3 represents conditions with the CN Speers crossing being blocked and Station 9 being consolidated. The results of the initial arriving company analysis are shown below in **Figure 23** and the results of the initial full alarm assignment are shown in **Figure 24**. As indicated within the figures displaying these results, with this crossing blocked, WFPS would still be able to reach the entire Development with an initial arriving apparatus within four minutes of travel time and would still be able to assemble an initial full alarm assignment of 15 firefighters within eight minutes of travel time.

A summary of the results of the One Blocked Crossing Scenarios Analysis is presented in **Table 11**.

Figure 21: One Blocked Crossing Scenario A3 – Initial Arriving Company Results

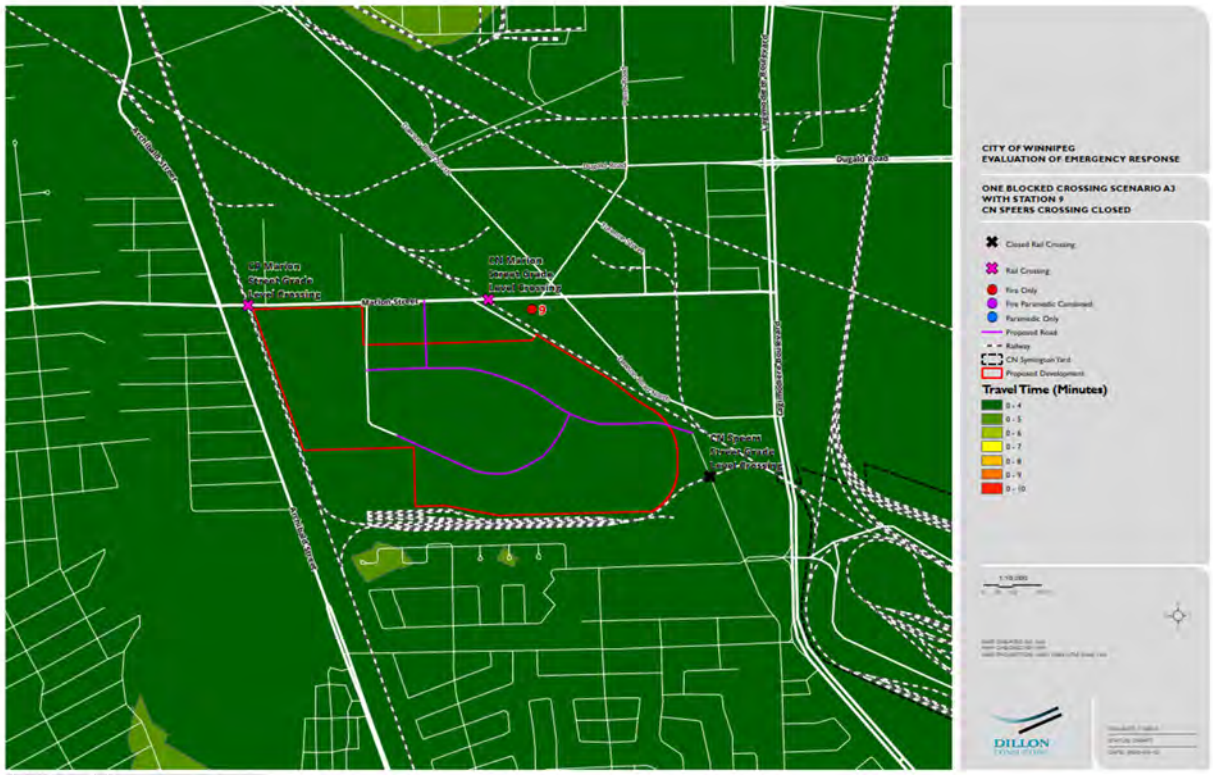


Figure 22: One Blocked Crossing Scenario A3 - Initial Full Alarm Assignment Results

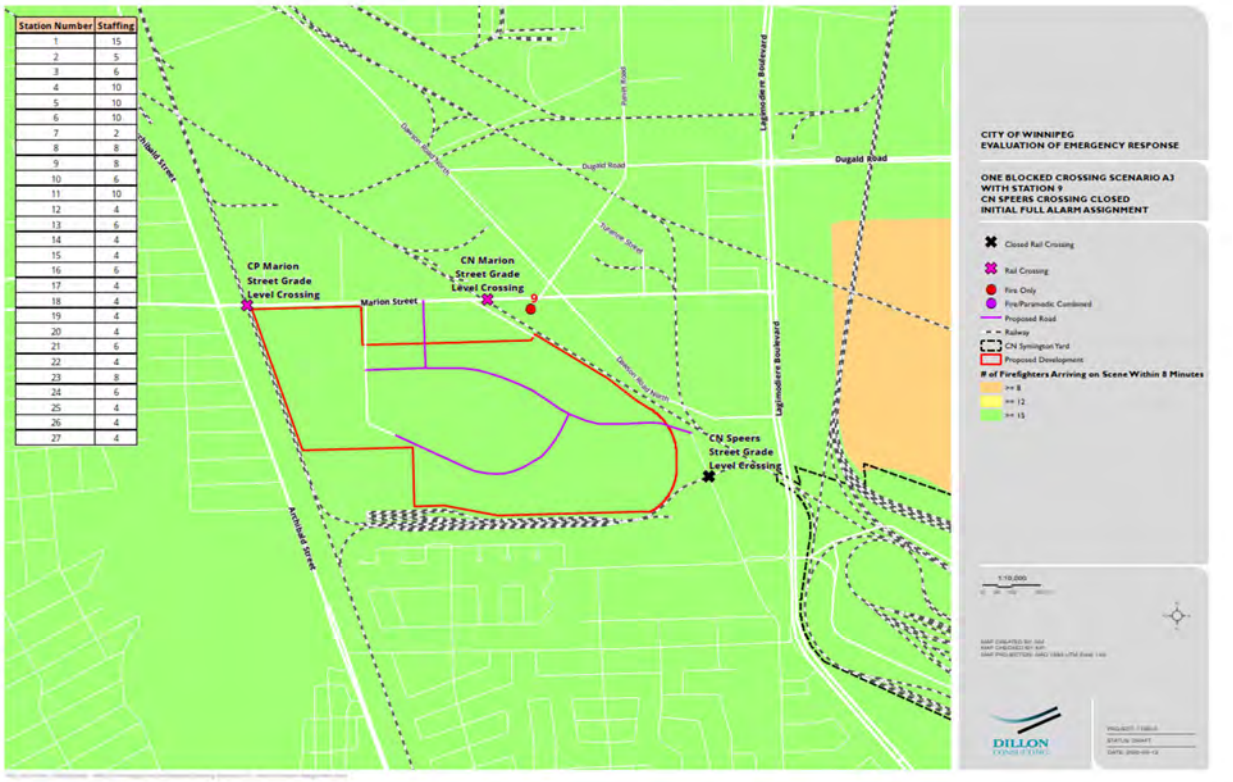


Figure 23: One Blocked Crossing Scenario B3 – Initial Arriving Company Results

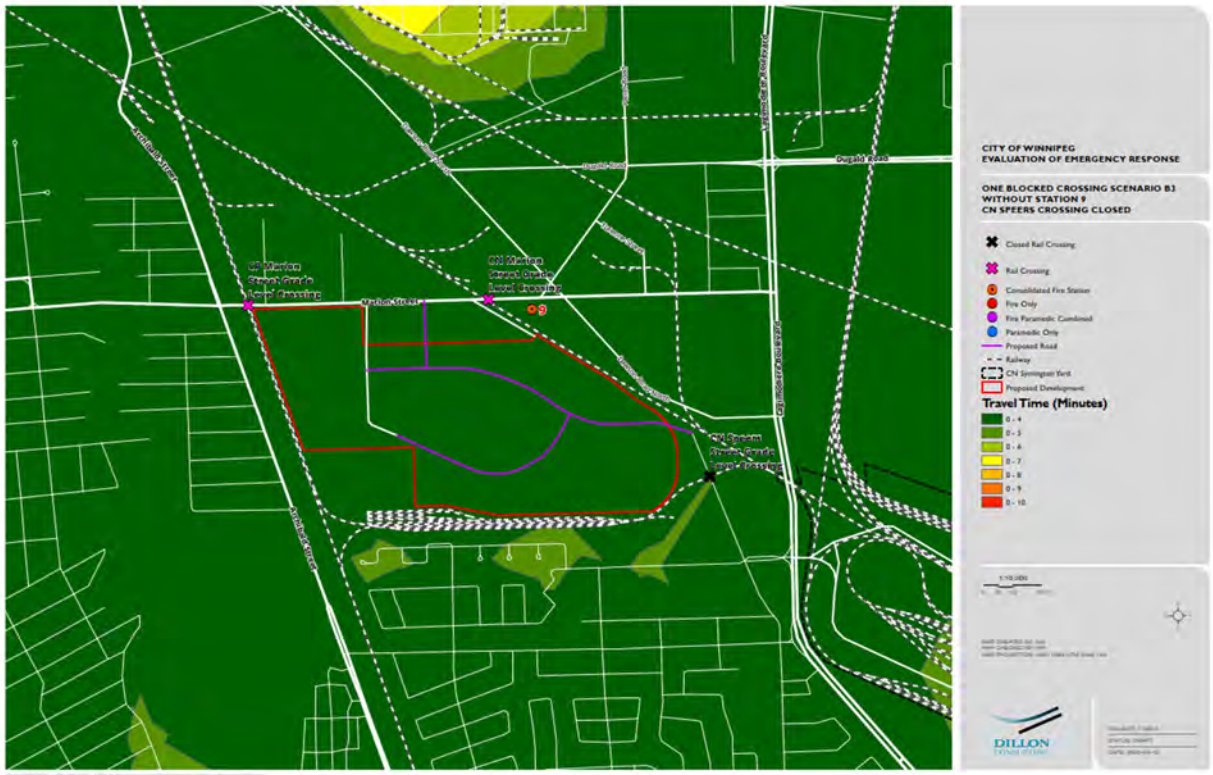


Figure 24: One Blocked Crossing Scenario B3 - Initial Full Alarm Assignment Results

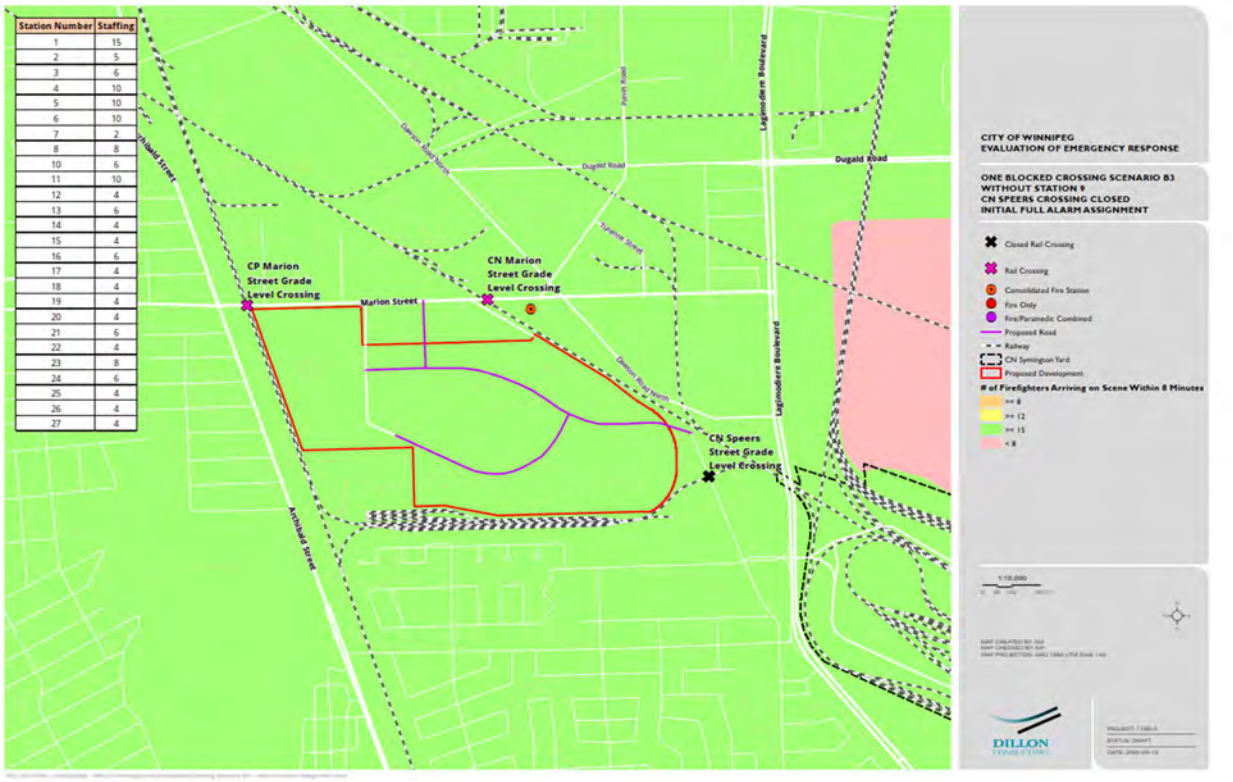


Table 11: Summary of One Blocked Crossing Scenarios Results

Scenario	Performance Target	Results
One Blocked Crossing Scenario A1 Existing station locations and staffed apparatus, including Station 9. Two of three crossings open and accessible – CP Marion Crossing blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
One Blocked Crossing Scenario B1 Existing station locations and staffed apparatus, excluding Station 9. Two of three crossings open and accessible – CP Marion Crossing blocked.	Initial Arriving Company	Approximately half of the Development is responded to with initial arriving company arriving within 4 minutes or less of travel time. The other half experiences a travel time of up to 5 minutes, representing up to a 1 minute delay.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
One Blocked Crossing Scenario A2 Existing station locations and staffed apparatus, including Station 9. Two of three crossings open and accessible – CN Marion Crossing blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
One Blocked Crossing Scenario B2 Existing station locations and staffed apparatus, excluding Station 9. Two of three crossings open and accessible – CN Marion Crossing blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
One Blocked Crossing Scenario A3 Existing station locations and staffed apparatus, including Station 9. Two of three crossings open and accessible – CN Speers Crossing blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
One Blocked Crossing Scenario B3 Existing station locations and staffed apparatus, excluding Station 9. Two of three crossings open and accessible – CN Speers Crossing blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.

4.4.3 Response Scenario of Two Rail Crossings Blocked Simultaneously (A and B)

The scenarios presented in this section represent a simulation of two of the three grade-level crossings being blocked and inhibiting the WFPS from accessing the site at two of the three site access points. These scenarios are considered to represent a 'worst case scenario' of emergency response access to the proposed development. As stated in **Table 15: Results of Conditional Probabilities for Grade Crossing Blockage Scenarios**, there is only a 0.241% chance that two of the level crossings would be

blocked simultaneously during an emergency call on the site. This translates to a 99.759% chance that at least one of the three grade level crossings will be available for site access during the time of a fire and emergency call within the proposed development.

Worst Case Scenario 1 maintains the CP Marion Street grade level crossing open, and closes the CN Marion Street and CN Speers Road grade level crossings at the same time. Scenarios marked with '**A**' include existing Station 9 in the response and those marked with '**B**' exclude Station 9. The initial arriving company results for **Worst Case Scenario A1** are shown in **Figure 25** and the initial full alarm assignment for **Worst Case Scenario A1** are shown in **Figure 26. Worst Case Scenario A1**, maintaining the CP Marion Street crossing open and including existing Station 9, provides for continued initial arriving company coverage to the entire site within four minutes of travel time. The entire proposed Development would also continue to be served by 15 firefighters arriving on-scene within eight minutes of travel time as shown in the full alarm assignment results.

The initial arriving company results for **Worst Case Scenario B1** in **Figure 27** and the initial full alarm assignment for **Worst Case Scenario B1** are presented in **Figure 28**. **Worst Case Scenario B1**, in which Station 9 is consolidated, shows results that are very similar to **Worst Case Scenario A1** results. Both the initial arriving company and the initial full alarm assignment coverage continue to meet the performance targets within the entire site.

Figure 25: Worst Case Response Scenario A1 - Initial Arriving Company Results

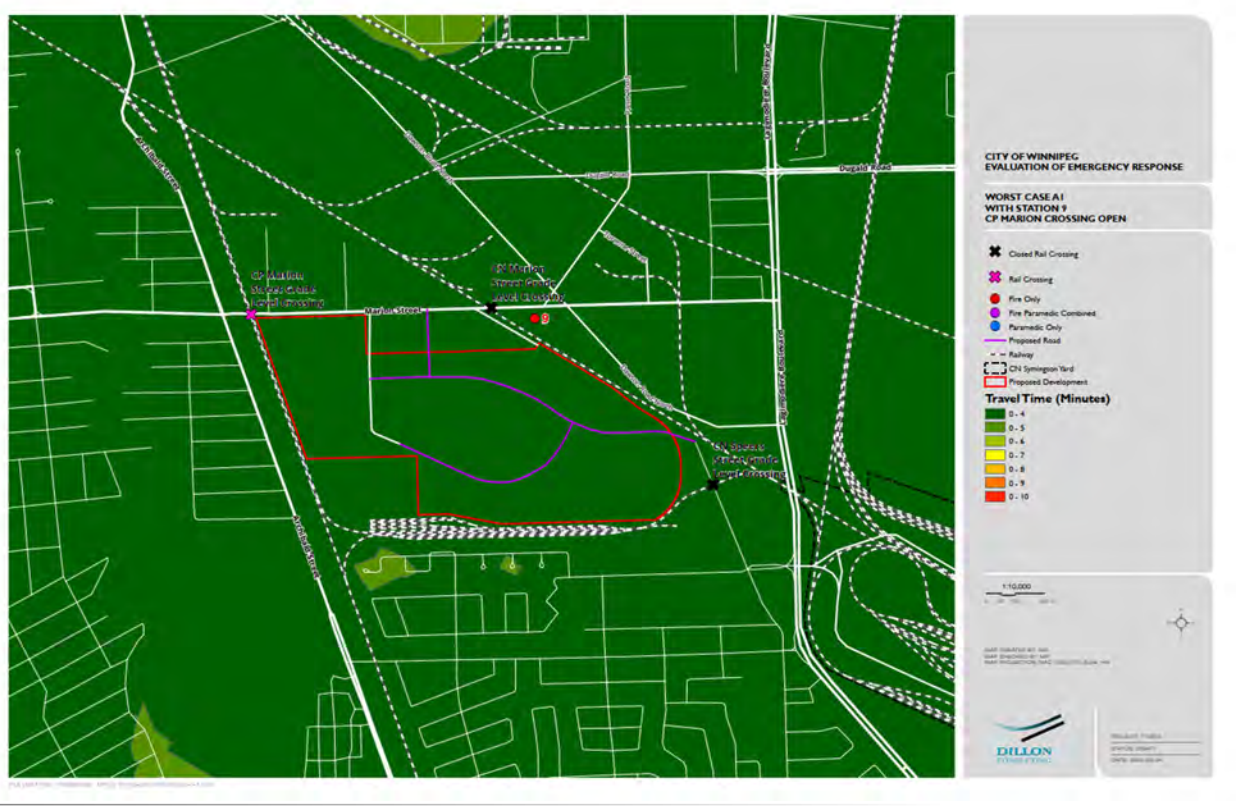


Figure 26: Worst Case Response Scenario A1 - Initial Full Alarm Assignment

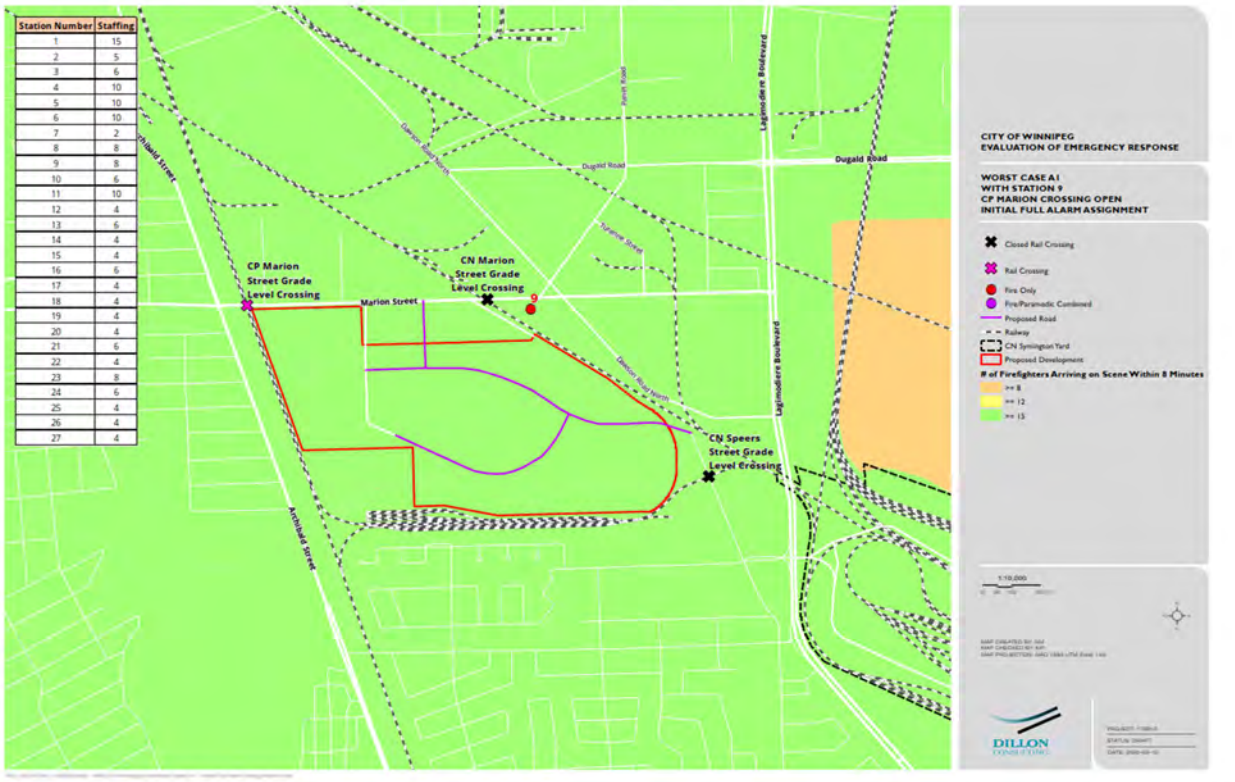


Figure 27: Worst Case Response Scenario B1 - Initial Arriving Company Results

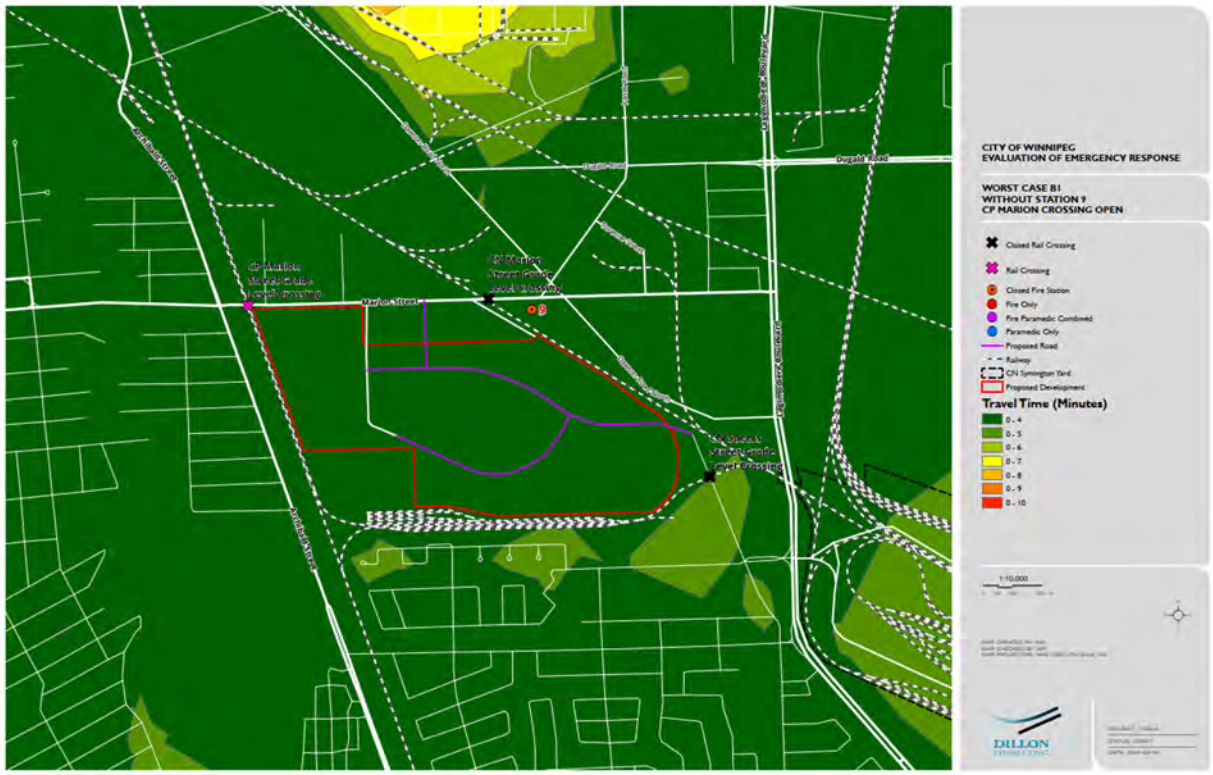
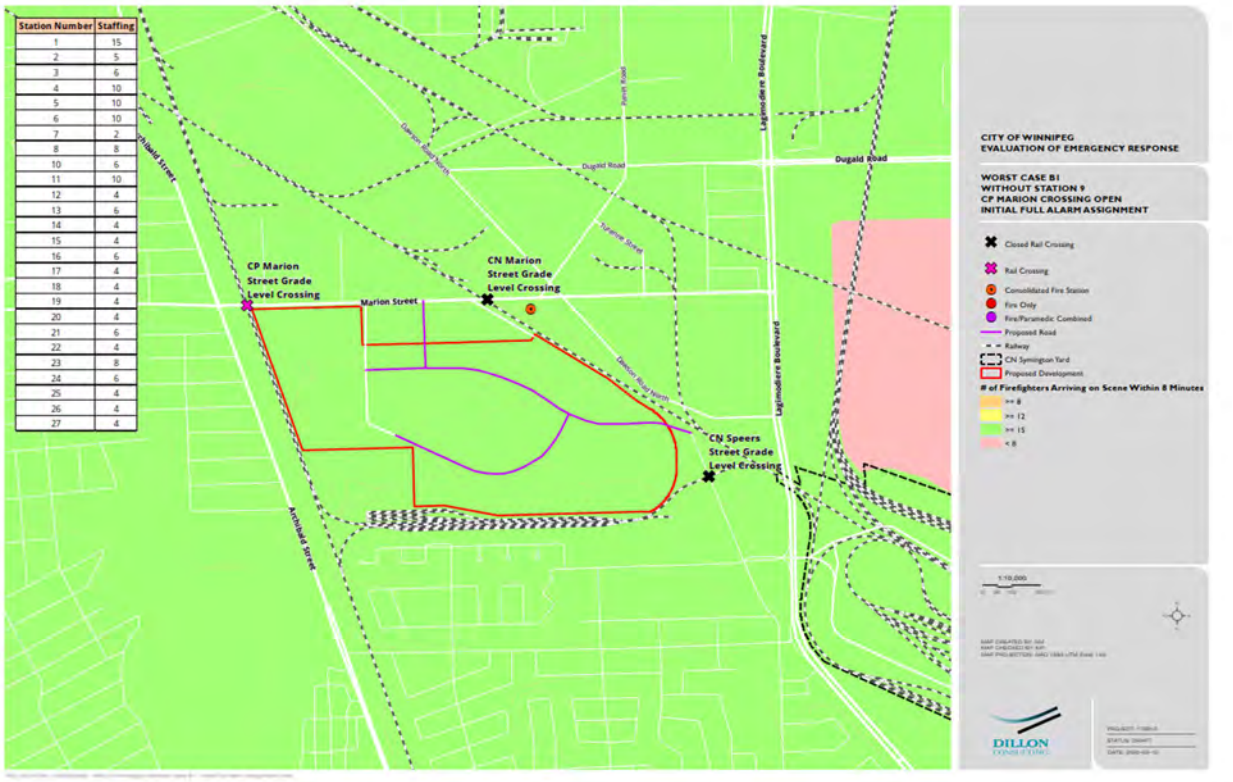


Figure 28: Worst Case Response Scenario B1 - Initial Full Alarm Assignment



Worst Case Response Scenario 2 maintains the CN Marion Street grade level crossing open and closes the CP Marion Street and CN Speers Road grade level crossings at the same time. The results of **Worst Case Response Scenario A2** (Station 9 existing) are shown in **Figure 29** for the initial arriving apparatus analysis and in **Figure 30** for the initial full alarm assignment analysis.

The results of **Worst Case Response Scenario B2** (Station 9 consolidation) are shown in **Figure 31** for the initial arriving apparatus analysis and in **Figure 32** for the initial full alarm assignment analysis.

Worst Case Response Scenario A2, with CN Marion Street grade level crossing open and Station 9 in operation results in very similar coverage to **Worst Case Response Scenario A1**, with the site being fully covered within four minutes of travel time. **Worst Case Response Scenario B2**; however, begins to represent travel time coverage of five and six minutes to a significant portion of the proposed development, representing a somewhat delayed emergency response from the four minute service target for the initial arriving apparatus. Also of note is that this rail blockage scenario results in initial arriving apparatus delays to areas north of the proposed development, on the opposite side of Marion Street. The initial full alarm assignment results for this scenario show that the entire Development is covered by the performance target, achieving 15 firefighters on scene within the eight minute travel time provided.

Figure 29: Worst Case Response Scenario A2 - Initial Arriving Company Results

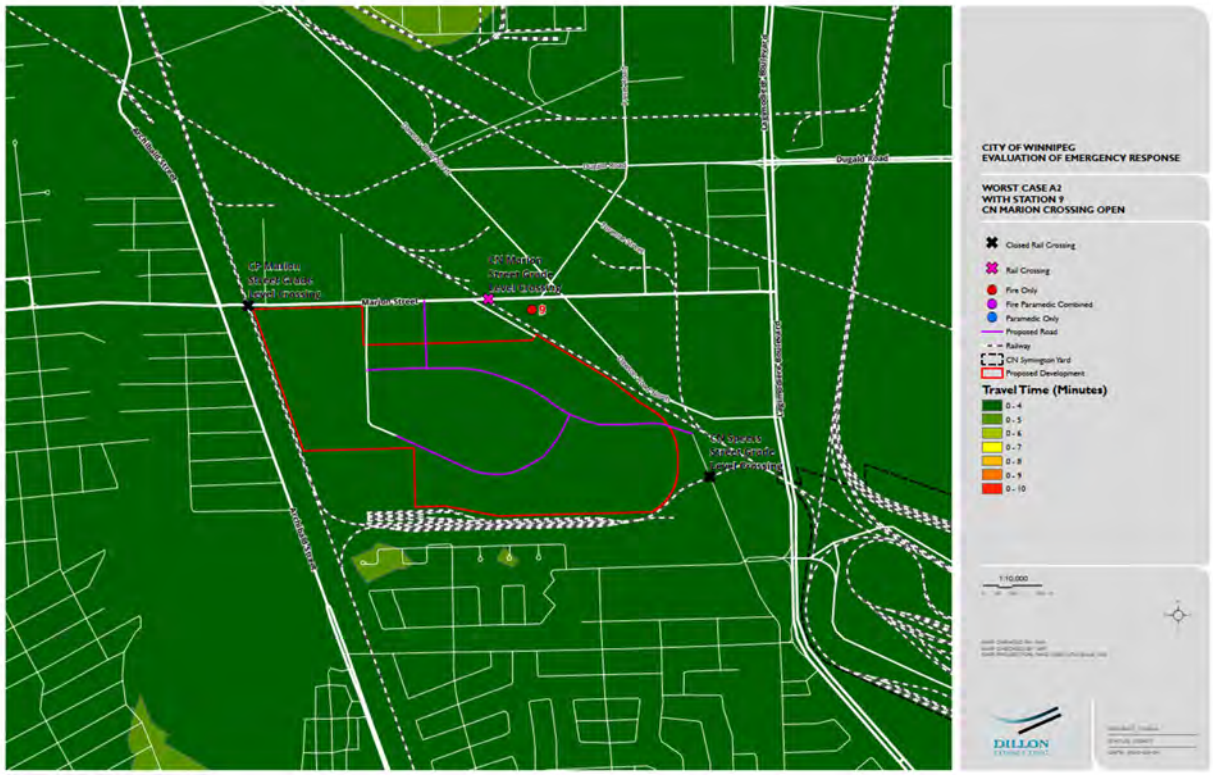


Figure 30: Worst Case Response Scenario A2 - Initial Full Alarm Assignment Results

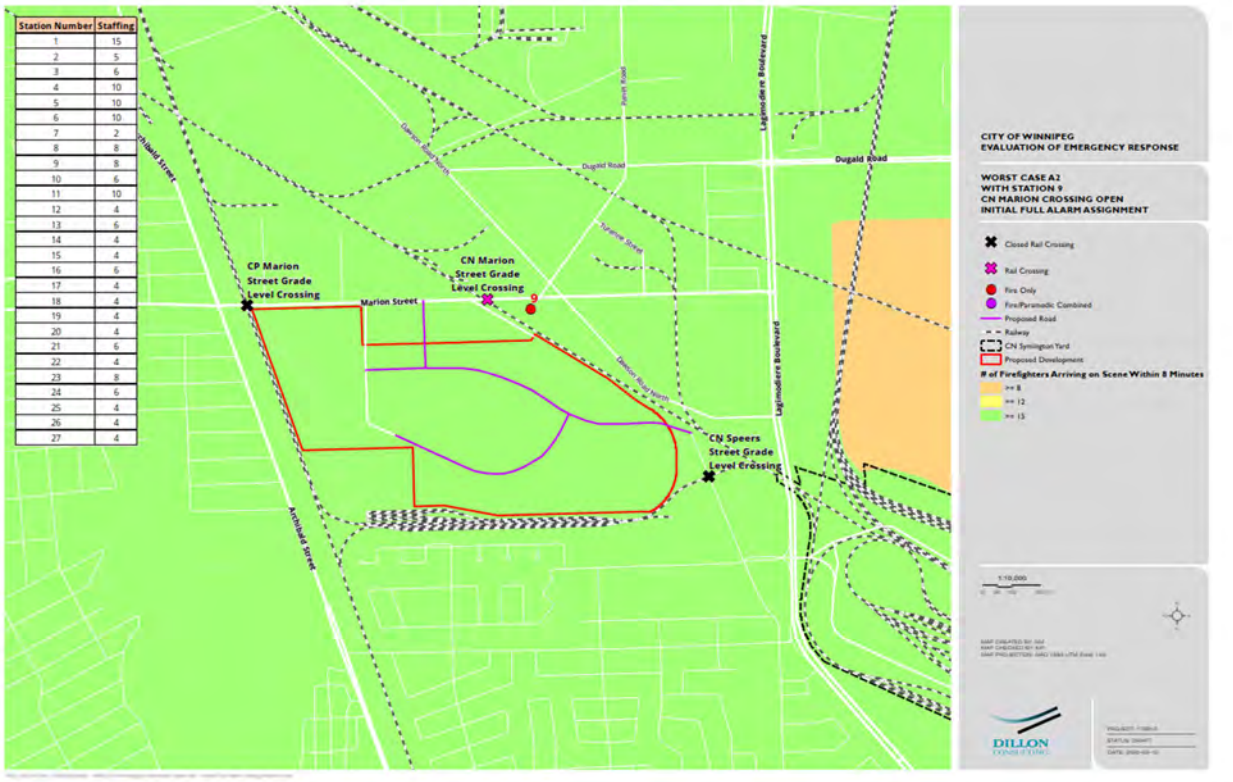


Figure 31: Worst Case Response Scenario B2 - Initial Arriving Company Results

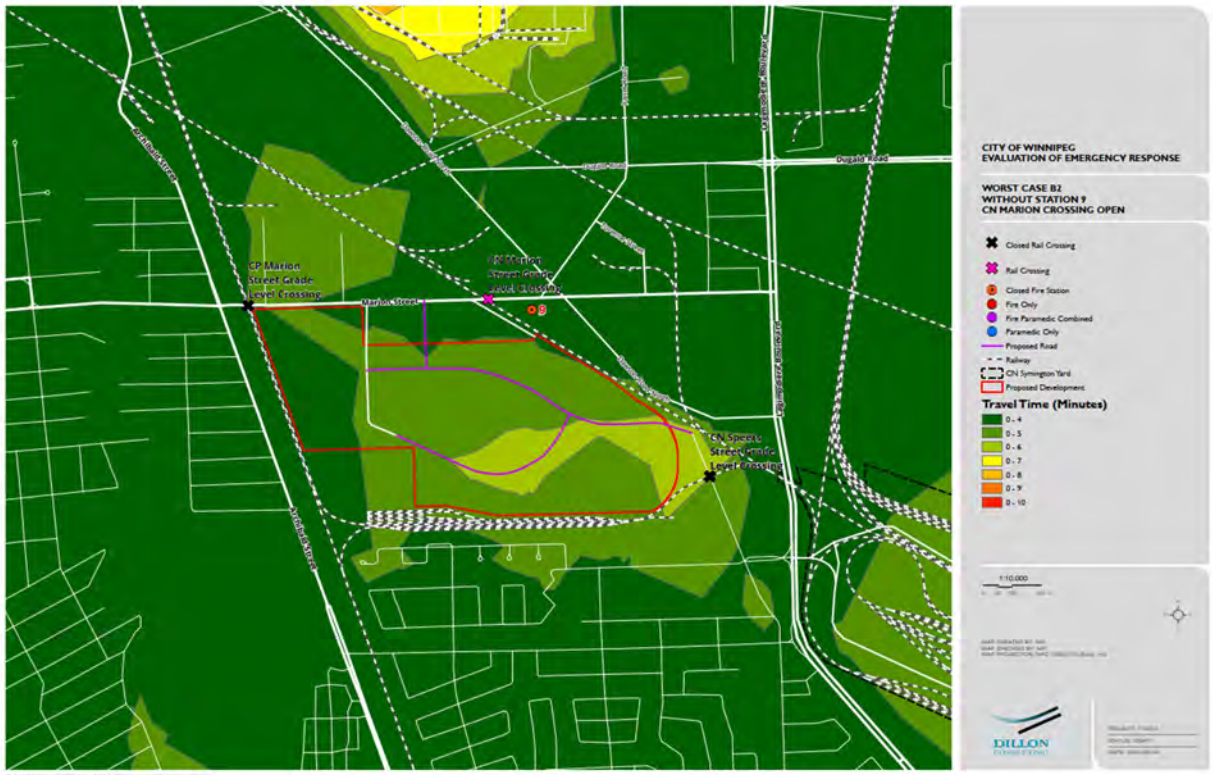
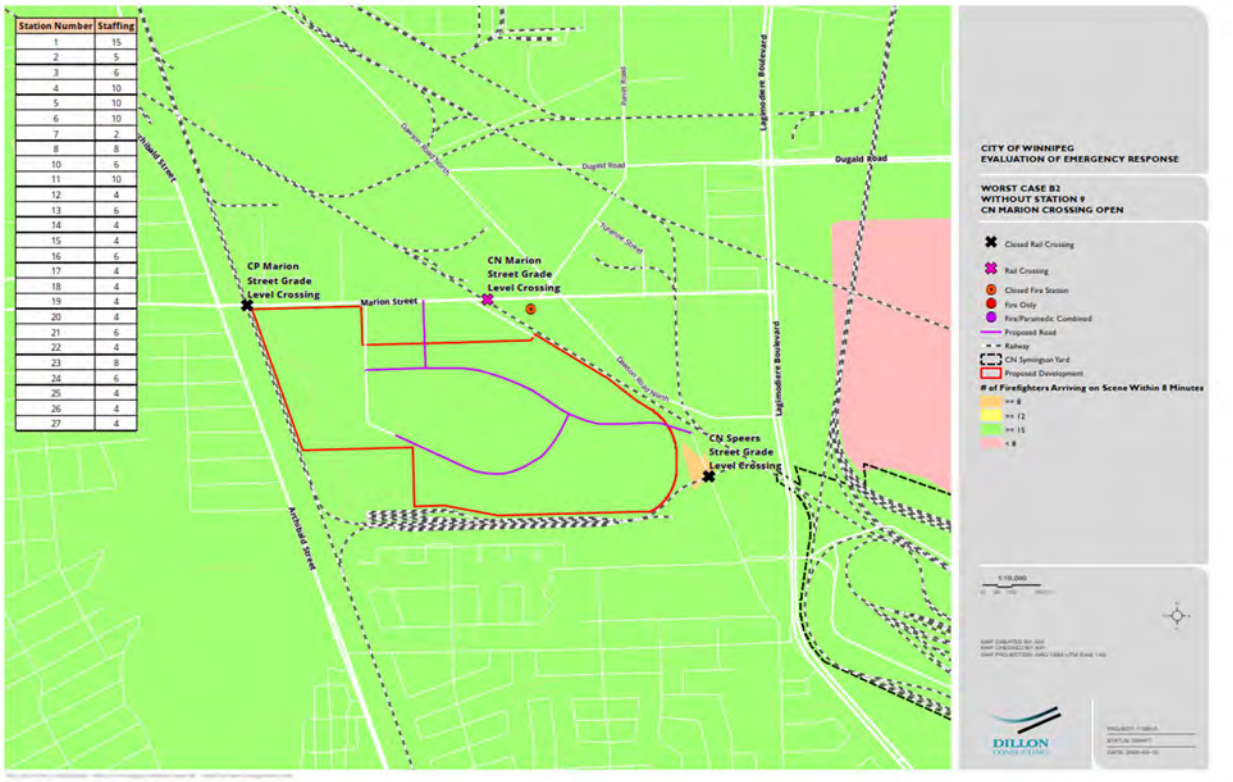


Figure 32: Worst Case Response Scenario B2 - Initial Full Alarm Assignment Results



Worst Case Response Scenario 3 maintains the CN Speers Road grade level crossing open, and closes the CP Marion Street and CN Marion Street grade level crossings at the same time. The results from **Worst Case Response Scenario A3** initial arriving apparatus analysis are shown in **Figure 33** and initial full alarm assignment analysis in **Figure 34**.

The results from **Worst Case Response Scenario B3** initial arriving apparatus analysis are shown in **Figure 35** and initial full alarm assignment analysis in **Figure 36**.

These two scenarios reflect the most significant delays to the proposed development and to the surrounding area for the initial arriving apparatus. In this scenario, with the two Marion Street crossings blocked, the response coverage to adjacent properties served by accesses along Marion Street is only available via access through the proposed development. Without the site access from Speers Road and the internal road network within the proposed development, there would be no access to the lands directly north of the site, the development south of Marion Street to the east of the site and to the industrial lands to the immediate southwest of the site.

Worst Case Response Scenario A3 reflects the longest delays for the initial arriving apparatus of the three Worst Case Scenarios that maintain Station 9. Approximately half of the proposed development experiences travel times in the five to six minute range, representing an increase over the performance

target of one to two minutes. The model also indicates delays to the neighbouring lands. The initial full alarm assignment coverage for this scenario continues to reach the vast majority of the site. There is a very isolated pocket of area in the northeast corner of the site that shows the potential of only 12 firefighters arriving within eight minutes of travel time. This is still very thorough coverage for this performance target.

Worst Case Response Scenario B3 initial arriving apparatus results present modelled travel times to the site of between five to eight minutes. This scenario also reflects delays north of Marion Street in property adjacent to the proposed development. The initial full alarm assignment coverage for this scenario continues to reach the vast majority of the site. There is an isolated pocket of area in the northeast corner of the site that shows the potential of less than 15 firefighters (range of 12 to less than eight) arriving within eight minutes of travel time. This is still very thorough coverage for this performance target.

A summary of the results of the Worst Case Scenario Analysis is presented in **Table 12**.

Figure 33: Worst Case Response Scenario A3 - Initial Arriving Company Results

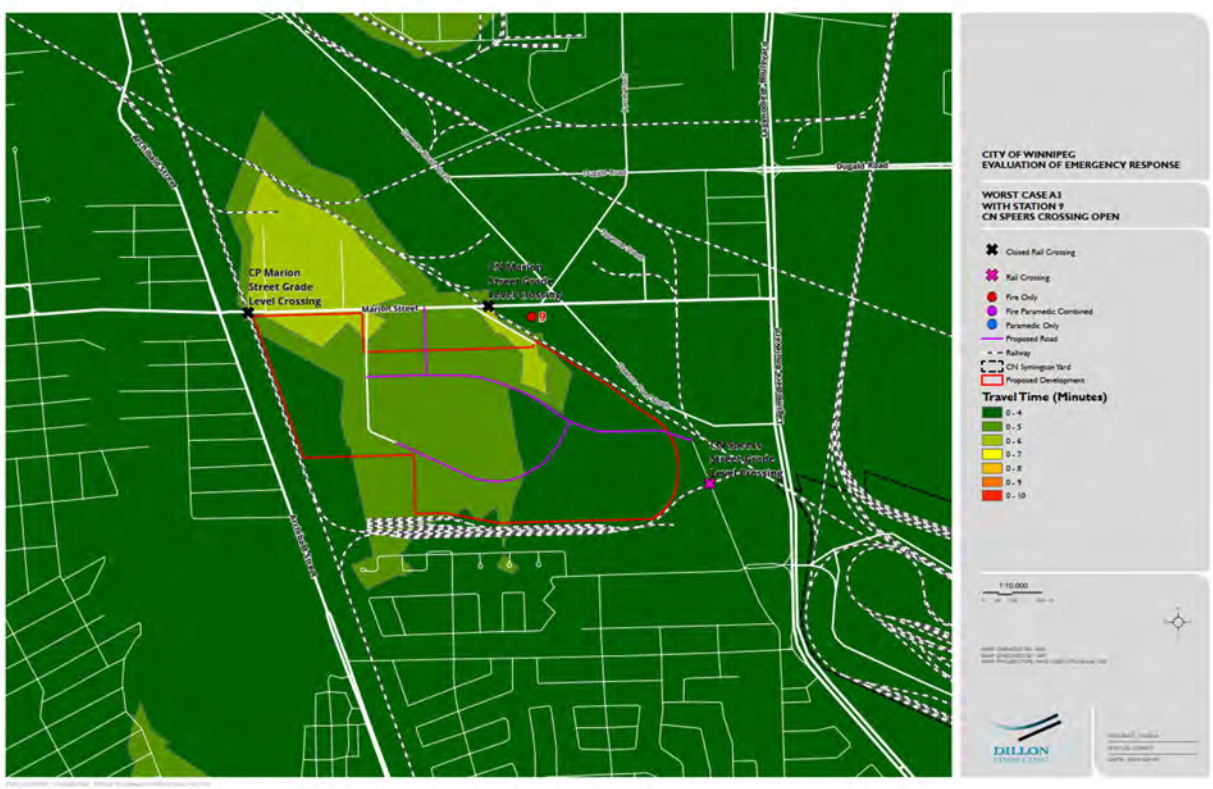


Figure 34: Worst Case Response Scenario A3 - Initial Full Alarm Assignment Results

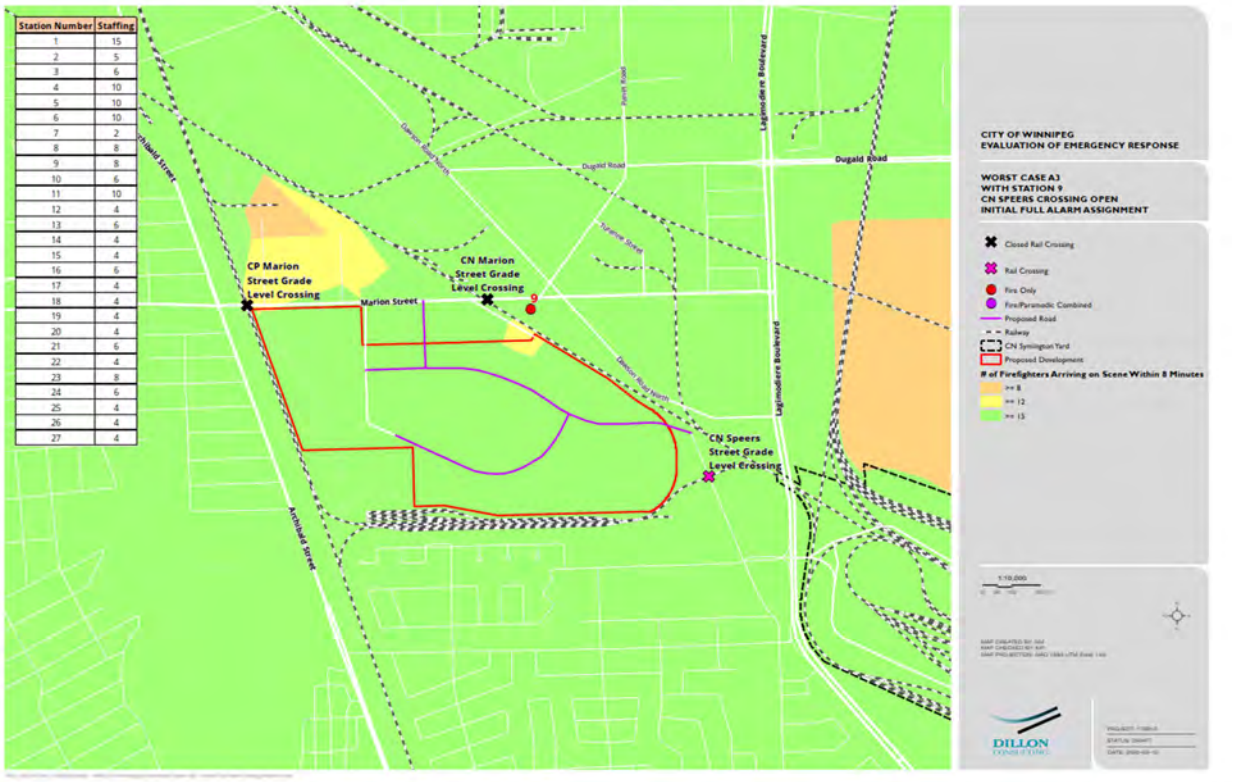


Figure 35: Worst Case Response Scenario B3 - Initial Arriving Company Results



Figure 36: Worst Case Response Scenario B3 - Initial Full Alarm Assignment Results

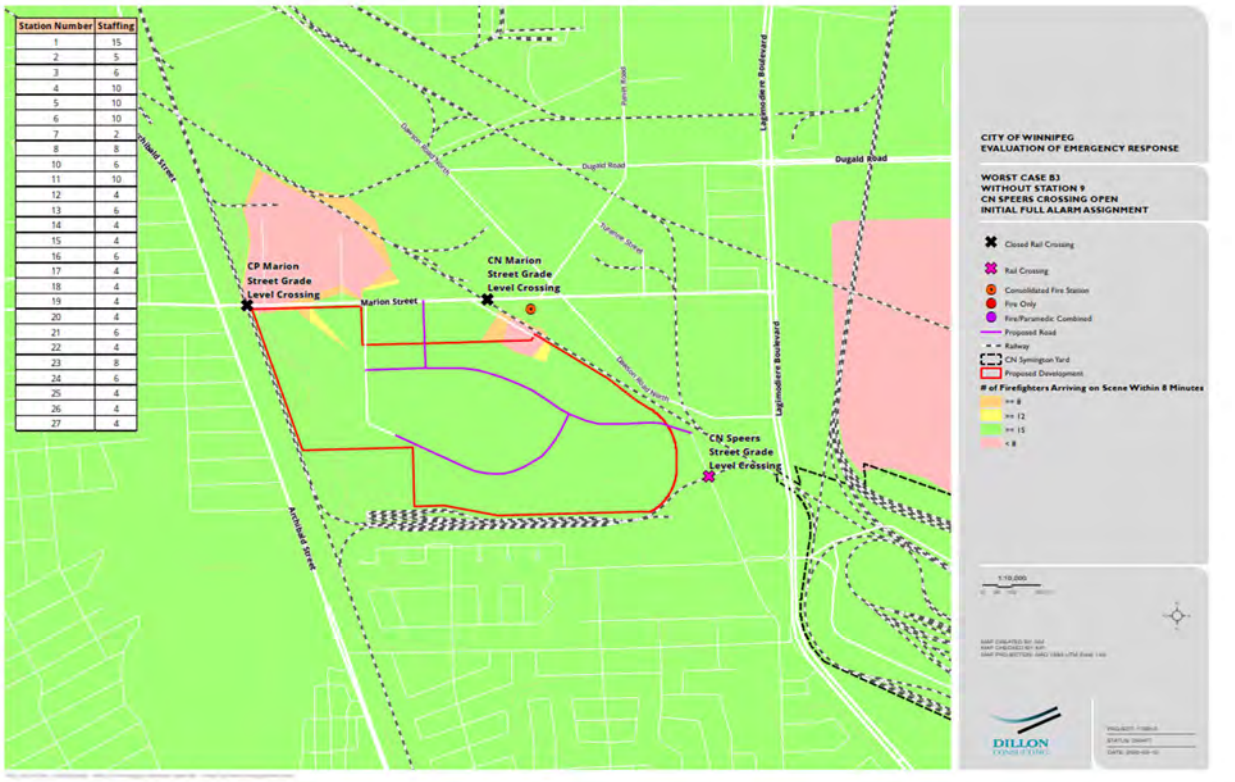


Table 12: Summary of Worst Case Response Scenarios (Two Blocked Crossings) Results

Scenario	Performance Target	Results
Worst Case Scenario A1 Existing station locations and staffed apparatus, including Station 9. CP Marion crossing remains open. CN Marion and CN Speers crossings are blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
Worst Case Scenario B1 Existing station locations and staffed apparatus, excluding Station 9. CP Marion crossing remains open. CN Marion and CN Speers crossings are blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
Worst Case Scenario A2 Existing station locations and staffed apparatus, including Station 9. CN Marion crossing remains open. CP Marion and CN Speers crossings are blocked.	Initial Arriving Company	Entire Development responded to with initial arriving company arriving within 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less.
Worst Case Scenario B2 Existing station locations and staffed apparatus, excluding Station 9. CN Marion crossing remains open. CP Marion and CN Speers crossings are blocked.	Initial Arriving Company	The Development is responded to with initial arriving company arriving within between 4 to 6 minutes or less of travel time. This represents up to a 2 minute delay for a portion of the development. The majority of the development is covered within 5 minutes or less of travel time.
	Initial Full Alarm Assignment	Almost the entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less. There is a very isolated area near the CN Speers crossing where the model indicates 8 firefighters or less arriving on scene within 8 minutes of travel time.
Worst Case Scenario A3 Existing station locations and staffed apparatus, including Station 9. CN Speers crossing remains open. CN Marion and CP Marion crossings are blocked.	Initial Arriving Company	The Development is responded to with initial arriving company arriving within between 4 to 6 minutes or less of travel time. This represents up to a 2 minute delay for two small areas of the Development. Approximately half the Development is covered within 5 minutes or less of travel time, and the remainder meets the target of 4 minutes or less of travel time.
	Initial Full Alarm Assignment	Almost the entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less. There is a very isolated area near Station 9 where the model indicates 12 firefighters or less arriving on scene within 8 minutes of travel time.

Scenario	Performance Target	Results
Worst Case Scenario B3 Existing station locations and staffed apparatus, excluding Station 9. CN Speers crossing remains open. CN Marion and CP Marion crossings are blocked.	Initial Arriving Company	The Development is responded to with initial arriving company in between 5 to 8 minutes or less of travel time.
	Initial Full Alarm Assignment	Almost the entire Development responded to with 15 firefighters arriving in 8 minutes of travel time or less. There is an isolated pocket of area in the northeast corner of the site that shows the potential of less than 15 firefighters (range of 12 to less than eight) arriving within eight minutes of travel time.

4.5 Consideration of Site Evacuation Routes

The analysis of emergency response into the Development shown above indicates that when one crossing is blocked the response times to the site remain relatively unaffected. When two of the crossings are blocked, there are scenarios where the emergency response is delayed; however, it continues to reflect the level of emergency response provided to other areas of the City.

In the event of an emergency situation that required the evacuation of the site, where one of the grade level crossings were blocked, there would be no expected challenge in using the other two site access points as evacuation routes. In the event where two crossings were blocked, emergency evacuation could occur through only one site access. Using one access to move the site traffic out of the development would take more time and traffic control to achieve, but would still provide an evacuation option for the Development.

5.0 Risk Analysis

The Rail Operations Analysis identified the circumstances that could lead to one or more of the grade level crossings being blocked, as well as the amount of time that is reasonable to expect the grade level crossings to be blocked. With the Fire and Emergency Services Analysis, we estimated the frequency of emergency calls from within the Development that is expected to occur, and analyzed the time delays that WFPS would incur if one or more of the grade level rail crossings were blocked during an emergency call.

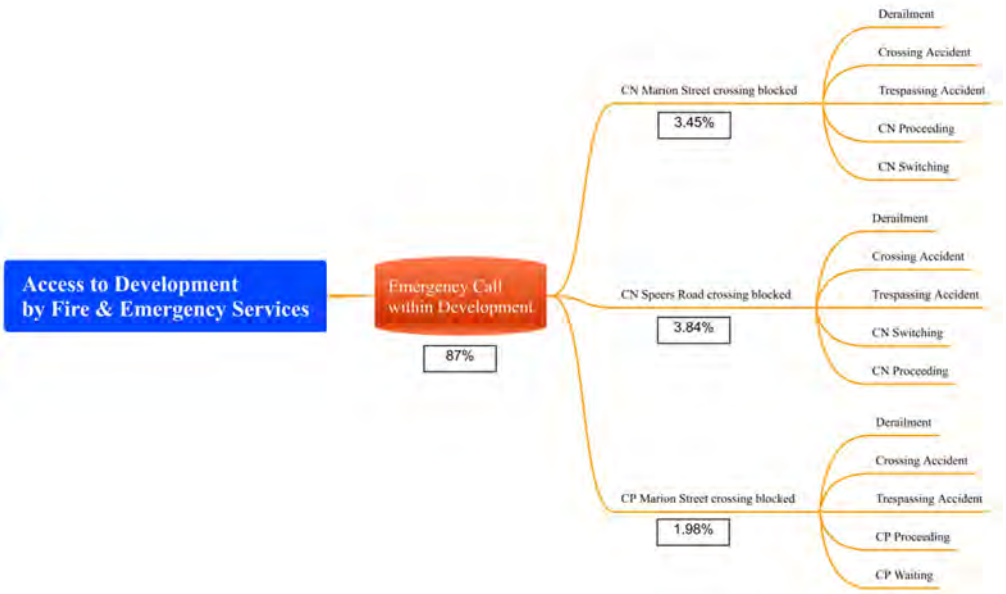
The objective of the Risk Analysis is to consolidate the findings from the Rail Operations Analysis and the Fire and Paramedic Response Analysis, in order to determine the likelihood and consequences of worst-case scenarios. Specifically, the likelihood of one or more of the three grade level crossings being blocked at the same time as WFPS is responding to an emergency call from within the Development.

The question is one of "conditional probability" – measure of the probability of an event occurring given that another event has occurred. For the Study, this translates to a potential risk:

If there is an emergency call from within the Development.
and
If one or more of the grade level crossings are blocked at the same time.

A tree diagram is a visual representation of conditional probabilities, which is illustrated in **Figure 37**.

Figure 37: Event Tree – Scenarios leading to Grade Crossing Blockage during an Emergency Call



As previously stated in Section 1.1, for the purpose of the Study, Risk is defined as:

RISK = The likelihood of the event X The consequences of the event,

Where the "event" is the blockage of one or more of the three grade level crossings at the same time as WFPS is responding to a call from within the Development.

The conditional probabilities for each grade level rail crossing are provided in **Table 13**.

Table 13: Summary of Conditional Probabilities for Blockage of Each Grade Level Crossing during an Emergency Call from within Development

Crossing Blocked	Causes of a Grade Level Crossing to be Blocked	Minutes Occupied/ Blocked per Day (Year 2030)	% Time Occupied/ Blocked per Day (Year 2030)	Estimated Chance of Emergency Call within the Development per Day	Probability of Grade Level Crossing Blocked during an Emergency Call
CN Marion Street Crossing blocked	Derailment	0.002			
	Crossing Accident	0.005			
	Trespassing Accident	0.005			
	CN Proceeding	22.280			
	CN Switching	27.389			
	Total	**49.7 minutes**	**3.45%**	**87%**	**3.00%**
CN Speers Road Crossing blocked	Derailment	0.001			
	Crossing Accident	0.003			
	Trespassing Accident	0.007			
	CN Switching	54.777			
	CN Proceeding	0.543			
	Total	**55.3 minutes**	**3.84%**	**87%**	**3.34%**
CP Marion Street Crossing blocked	Derailment	0.002			
	Crossing Accident	0.005			
	Trespassing Accident	0.005			
	CP Proceeding	27.997			
	CP Waiting	0.506			
	Total	**28.5 minutes**	**1.98%**	**87%**	**1.72%**

For each of the three scenarios that were identified in the Rail Operations Analysis, the method to calculate the conditional probabilities is summarized in **Table 14**, with the results provided in **Table 15**.

Table 14: Determination of Conditional Probabilities for Grade Crossing Blockage Scenarios

Scenarios	Conditional Probability
Scenario 1 – One Crossing Blocked during an Emergency Call	Summation of: • 87% x 3.45% = 3.00% for CN Marion Street • 87% x 3.84% = 3.34% for CN Speers Road • 87% x 1.98% = 1.72% for CP Marion Street
Scenario 2 – Two Crossings Blocked at same time as an Emergency Call	Summation of: • 87% x (3.45% x 3.84%) • 87% x (3.45% x 1.98%) • 87% x (3.84% x 1.98%)
Scenario 3 – Three Crossings Blocked at same time as an Emergency Call	87% x (3.45% x 3.84% x 1.98%)

Table 15: Results of Conditional Probabilities for Grade Crossing Blockage Scenarios – Year 2030

Scenarios	% Time Occupied or % Chance of being Blocked	Estimated Chance of an Emergency Call within the Development	% Chance of the Crossing(s) being Blocked during an Emergency Call
Scenario 1 – One Crossing Blocked during an Emergency Call	9.27%	87%	8.07%
Scenario 2 – Two Crossings Blocked at same time as an Emergency Call	0.277%	87%	0.241%
Scenario 3 – Three Crossings Blocked at same time as an Emergency Call	0.00263%	87%	0.00228%

6.0 Conclusions

The conclusions of the Study address the primary questions for each section of the report as summarized in **Table 16**.

Table 16: Relevant Questions to be Answered by the Study

Relevant Questions to Answer	
Question 1:	What is the probability of one or more of the three grade level crossings to be blocked when WFPS is responding to a call within the Development?
Question 2:	If one or more of the three grade level crossings are blocked when WFPS is responding to a call within the Development, is there an increase in response time, and if so, what is the response time for WFPS?

Based on the findings of the Study, the following concluding statements can be made (Note – all values are based on projected growth in train traffic to the Year 2030):

- 91.93% chance that all three grade level rail crossings will be open during an emergency call.
- 99.759% chance that at least two grade level rail crossings will be open during an emergency call.
- 99.998% chance that at least one grade level rail crossing will be open during an emergency call.
- The Development and its internal road network will increase the connectivity to existing grade level rail crossings from two to three, providing better access to lands bordered by CN and CP. It will provide one additional access point from the east connecting to the existing Speers Road grade level crossing. The chance of having all three grade level crossings blocked at the same time is 0.00263%. By increasing the number of grade level crossings that can be used to access the lands north and south of Marion Street from two to three, there is a 96% net improvement in accessibility [(0.068 – 0.00263)/0.068] = 96%.
- The response of the WFPS to the Development achieves the initial arriving company and initial full alarm assignment performance targets, when all three of the rail crossings are open in scenarios that both include and exclude Station 9.
- The response of the WFPS to the Development achieves the initial arriving company and initial full alarm assignment performance targets in five of the six scenarios, where one of the three rail crossings is blocked.
- When two of the three rail crossings are blocked the WFPS response to the Development achieves the initial arriving company performance targets in three of the six scenarios and achieves travel times of between four to eight minutes in the other three scenarios.
- When two of the three rail crossings are blocked the WFPS response to the Development achieves the initial full alarm assignment performance targets to the entire site with the exception of three scenarios that identify small isolated areas below the target.

- In scenarios with identified response delays measured against the initial arriving apparatus performance target, the travel times range from four to eight minutes to reach the entire Development. This performance is comparable to the travel times between four to eight minutes provided to 33% of the City's area measured under Baseline Scenario A (the City's existing conditions).

In conclusion, based on the analysis and findings presented within this report, in the event that one or two of the grade level rail crossings are blocked, the predicted response times of the WFPS to the Development continue to meet the performance targets or remain within the range of existing service levels provided across the City of Winnipeg. The likelihood of having at least one grade level crossing open during an emergency call is 99.998%, or that within a 43,783 year time frame, it is reasonable to expect there will be one incident where all three grade level rail crossings would be closed during an emergency call from within the Development.

7.0 Closure

This report was prepared exclusively for the purposes, project and site location outlined in the report. The report is based on information provided to, or obtained by Dillon Consulting Limited as indicated in the report, and applies solely to site conditions at the time of the Study. Although a reasonable Study was conducted by Dillon, Dillon's Study was by no means exhaustive and cannot be construed as a certification of site conditions. Rather, Dillon's report represents a reasonable review of available information within an agreed work scope, schedule and budget.

This report was prepared by Dillon for the sole benefit of our Client, 7319704 Manitoba Ltd. and the City of Winnipeg. The material in it reflects Dillon's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Respectfully submitted,

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Stantec

Development of MRS-D Traffic Impact Study

Final Report

February 11 2020
Rev 2 May 2020



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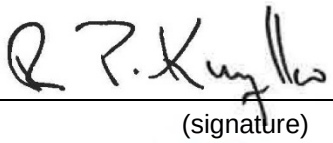
Reviewed by 
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Table of Contents

1.0 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 OBJECTIVES 1

2.0 CONTEXT 2
2.1 LOCATION 2
2.3 PROPOSED LAND USE 3
2.4 EMERGENCY VEHICLE ACCESS CONCERNS 6
2.4.1 Train Activity Detection at Railway Crossings on Marion Street 6
2.4.2 Sustainable Cities and Communities - Resilient Cities 6
2.4.3 Sprinkler System 7
2.4.4 Emergency Services Within the Development 7
2.4.5 Summary 8
2.5 ADJACENT SITES / ROADWAY CONDITIONS 8
2.5.1 Land Use 8
2.5.2 Transportation 8
2.6 STUDY AREA 9
2.7 HORIZON YEARS AND TIME PERIODS FOR ANALYSIS 10

3.0 TRAFFIC VOLUMES 11
3.1 EXISTING TRAFFIC VOLUMES 11
3.1.1 Peak Hour Factors and Heavy Vehicles 15
3.1.2 Future Background Traffic 15
3.2 DEVELOPMENT GENERATED TRAFFIC 19
3.2.1 Trip Generation 19
3.2.2 Mode Split Adjustments 20
3.2.3 Internal Capture 22
3.2.4 Pass-By Trips 23
3.2.5 Directional Distribution 25
3.3 TOTAL FUTURE TRAFFIC 26

4.0 TRANSIT AND ACTIVE MODES 32

5.0 TRAFFIC ANALYSIS 36
5.1 MARION STREET AT ARCHIBALD STREET 36
5.1.1 Existing Conditions and Background Growth Scenarios 36
5.1.2 Mitigation Scenarios for Background Growth 42
5.1.3 Post-Development Scenarios 45
5.1.4 Marion St and Archibald St Summary 48
5.2 INTERSECTIONS OF MARION STREET, DAWSON ROAD AND PANET ROAD 49
5.2.1 Existing Conditions and Background Growth Scenarios 49
5.2.2 Post-Development Scenarios 56
5.3 MARION STREET AT LAGIMODIÈRE BOULEVARD 60
5.3.1 Existing Conditions and Background Growth Scenarios 60
5.3.2 Mitigation Scenarios for Background Growth 65
5.3.3 Post-Development Scenarios 67
5.3.4 Marion St and Lagimodière Blvd Summary 70

5.4 LAGIMODIÈRE BOULEVARD AT MAGINOT STREET 71
5.4.1 Existing Conditions and Background Growth Scenarios 71
5.4.2 Mitigation Scenarios 77
5.4.3 Post-Development Scenarios 78
5.4.4 Lagimodière Blvd and Maginot St Summary 82
5.5 MARION ST AND NICOLAS AVE 83

6.0 PROPOSED NEW INTERSECTIONS 86
6.1 MARION ST AT LOUS RIEL WAY/DUPUY AVE 86
6.2 SECONDARY ACCESS ON MARION ST 90
6.3 MAGINOT ST AND SPEERS RD 93

7.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 96
7.1 SUMMARY 96
7.2 CONCLUSIONS 97
7.3 RECOMMENDATIONS 97

LIST OF TABLES

Table 1: Study Area Street Characteristics 8
Table 2: Marion St and Panet St Volume Calculations 12
Table 3: Trip Generation – Partial Build Out 19
Table 4: Trip Generation – Full Build Out 20
Table 5: Effect of Further Mode Share Reductions 22
Table 6: Internal Capture Rates - Partial Build Out Scenario 23
Table 7: Internal Capture Rates - Full Build Out Scenario 23
Table 8: 2025 Partial Build Out – AM Peak Trip Breakdown 24
Table 9: 2025 Partial Build Out – PM Peak Trip Breakdown 24
Table 10: 2030 Full Build Out - AM Peak Trip Breakdown 24
Table 11: 2030 Full Build Out - PM Peak Trip Breakdown 24
Table 12: Directional Distribution for External Trips 25
Table 13: 2025 Partial Build Out - % Site Generated Traffic 31
Table 14: 2030 Full Build Out - % Site Generated Traffic 31
Table 15: Existing conditions (2019) Traffic Analysis at Marion St at Archibald St 38
Table 16: 2025 Background Growth Traffic Analysis at Marion St at Archibald St 40
Table 17: 2030 Background Growth Traffic Analysis at Marion St at Archibald St 42
Table 18: Analysis of Mitigation Measures at Marion St and Archibald St 44
Table 19: 2025 Partial Build Out with Mitigation Measures Traffic Analysis at Marion St and Archibald St 46
Table 20: 2030 Full Build Out with Mitigation Measures at Marion St and Archibald St 48
Table 21: Marion St and Archibald St - Summary of Analysis Scenarios 49
Table 22: 2019 Existing Conditions Traffic Analysis at Marion St and Dawson Rd 51
Table 23: 2025 Background Growth Traffic Analysis at Marion St and Dawson Rd 53
Table 24: 2030 Background Growth Traffic Analysis at Marion St and Dawson Rd 55
Table 25: 2025 Partial Build Out Traffic Analysis at Marion St and Dawson Rd 57
Table 26: 2030 Full Build Out Traffic Analysis at Marion St and Dawson Rd 59
Table 27: 2019 Existing Conditions Traffic Analysis at Marion St and Lagimodière Blvd 61
Table 28: 2025 Background Growth Traffic Analysis at Marion St and Lagimodière Blvd 63
Table 29: 2030 Background Growth Traffic Analysis at Marion St and Lagimodière Blvd 65
Table 30: Analysis of Mitigation Measures at Marion St and Lagimodière Blvd 66

Table 31: 2025 Partial Build Out with Mitigation Measures Traffic Analysis at Marion St and Lagimodière Blvd 68
Table 32: 2030 Full Build Out with Mitigation Measures Traffic Analysis at Marion St and Lagimodière Blvd 70
Table 33: Marion St and Lagimodière Blvd - Summary of Analysis Scenarios 71
Table 34: 2019 Existing Conditions Traffic Analysis at Lagimodière Blvd and Maginot St 73
Table 35: 2025 Background Growth Traffic Analysis at Lagimodière Blvd and Maginot St 75
Table 36: 2030 Background Growth Traffic Analysis at Lagimodière Blvd and Maginot St 77
Table 37: Analysis of Mitigation Measures at Lagimodière Blvd and Maginot St 78
Table 38: 2025 Partial Build Out with Mitigation Measures at Lagimodière Blvd and Maginot St 80
Table 39: 2030 Full Build Out with Mitigation Measures at Lagimodière Blvd and Maginot St 82
Table 40: Lagimodière Blvd and Maginot St - Summary of Analysis Scenarios 83
Table 41: AM Peak Period Traffic Analysis at Marion St and Nicolas Ave 84
Table 42: PM Peak Period Traffic Analysis at Marion St and Nicolas Ave 85
Table 43: AM Peak Period Traffic Analysis at Marion St and Louis Riel Way/Dupuy Ave 86
Table 44: PM Peak Period Traffic Analysis at Marion St and Louis Riel Way/Dupuy Ave 87
Table 45: Marion St and Louis Riel Way/Dupuy Ave Signalized Intersection Traffic Analysis 88
Table 46: Marion St and Louis Riel Way/Dupuy Ave Roundabout Traffic Analysis 90
Table 47: AM Peak Period Traffic Analysis of Secondary Access on Marion St 92
Table 48: AM Peak Period Traffic Analysis of Secondary Access on Marion St 93
Table 49: Maginot St and Speers Rd All-Way Stop Traffic Analysis 94
Table 50: Maginot St and Speers Rd Roundabout Traffic Analysis 95

LIST OF FIGURES

Figure 1: Regional Context 2
Figure 2: Public Markets (MRS D) Conceptual Development Plan 5
Figure 3: Study Area 9
Figure 4: Intersections of Marion St and Panet Rd and Dawson Rd 13
Figure 5: 2019 Existing Conditions - AM Peak (PM Peak) 14
Figure 6: 2025 Background Growth - AM Peak (PM Peak) 17
Figure 7: 2030 Background Growth - AM Peak (PM Peak) 18
Figure 8: Distribution Locations 26
Figure 9: 2025 Partial Build Out Site Generated Traffic Volumes AM Peak (PM Peak) 27
Figure 10: 2030 Full Build Out Site Generated Traffic Volumes AM Peak (PM Peak) 28
Figure 11: 2025 Partial Build Out Total Future Traffic – AM Peak (PM Peak) 29
Figure 12: 2030 Full Build Out Total Future Traffic – AM Peak (PM Peak) 30
Figure 13: Current Transit Routes 32
Figure 14: Existing Bike Network (Excerpt from City of Winnipeg Cycling Map) 34
Figure 15: Existing and Proposed Bike Infrastructure (excerpt from Winnipeg Pedestrian and Cycling Strategy) 35
Figure 16: Marion St at Archibald St - 2019 AM Background 37
Figure 17: Marion St at Archibald St - 2019 PM Background 37
Figure 18: Marion St at Archibald St - 2025 AM Background 39
Figure 19: Marion St at Archibald St - 2025 PM Background 39
Figure 20: Marion St at Archibald St - 2030 AM Background 41
Figure 21: Marion St at Archibald St - 2030 PM Background 41

Figure 22: Marion St and Archibald St – Intersection Configuration with Mitigation Measures....44
Figure 23: Marion St at Archibald St – 2025 AM – Partial Build-Out with Mitigation Measures....45
Figure 24: Marion St at Archibald St – 2025 PM – Partial Build-Out with Mitigation Measures....46
Figure 25: Marion St at Archibald St – 2030 AM – Full Build-Out with Mitigation Measures....47
Figure 26: Marion St at Archibald St – 2030 PM – Full Build-Out with Mitigation Measures....47
Figure 27: Marion St / Panet St / Dawson Rd – 2019 AM Background....50
Figure 28: Marion St / Panet St / Dawson Rd – 2019 PM Background....51
Figure 29: Marion St / Panet St / Dawson Rd – 2025 AM Background....52
Figure 30: Marion St / Panet St / Dawson Rd – 2025 PM Background....53
Figure 31: Marion St / Panet St / Dawson Rd – 2030 AM Background....54
Figure 32: Marion St / Panet St / Dawson Rd – 2030 PM Background....55
Figure 33: Marion St / Panet St / Dawson Rd – 2025 AM Partial Build Out....56
Figure 34: Marion St / Panet St / Dawson Rd – 2025 PM Partial Build Out....57
Figure 35: Marion St / Panet St / Dawson Rd – 2030 AM Full Build Out....58
Figure 36: Marion St / Panet St / Dawson Rd – 2030 PM Partial Build Out....59
Figure 37: Marion St and Lagimodière Blvd - 2019 AM Background....60
Figure 38: Marion St and Lagimodière Blvd - 2019 PM Background....61
Figure 39: Marion St and Lagimodière Blvd - 2025 AM Background....62
Figure 40: Marion St and Lagimodière Blvd - 2025 PM Background....62
Figure 41: Marion St and Lagimodière Blvd - 2030 AM Background....64
Figure 42: Marion St and Lagimodière Blvd - 2030 PM Background....64
Figure 43: Marion St and Lagimodière Blvd - Intersection Configuration with Mitigation Measures....66
Figure 44: Marion St and Lagimodière Blvd - 2025 AM Partial Build Out with Mitigation Measures....67
Figure 45: Marion St and Lagimodière Blvd - 2025 PM Partial Build Out with Mitigation Measures....68
Figure 46: Marion St and Lagimodière Blvd - 2030 AM Full Build Out with Mitigation Measures....69
Figure 47: Marion St and Lagimodière Blvd - 2030 PM Full Build-Out with Mitigation Measures....69
Figure 48: Lagimodière Blvd at Maginot St - 2019 AM Background....72
Figure 49: Lagimodière Blvd at Maginot St - 2019 PM Background....72
Figure 50: Lagimodière Blvd at Maginot St - 2025 AM Background....74
Figure 51: Lagimodière Blvd at Maginot St - 2025 PM Background....74
Figure 52: Lagimodière Blvd at Maginot St – 2030 PM Background....76
Figure 53: Lagimodière Blvd at Maginot St – 2030 PM Background....76
Figure 54: Lagimodière Blvd at Maginot St – 2025 AM Partial Build Out with Mitigation Measures....79
Figure 55: Lagimodière Blvd at Maginot St – 2025 PM Partial Build Out with Mitigation Measures....79
Figure 56: Lagimodière Blvd at Maginot St – 2030 AM Full Build Out with Mitigation Measures....81
Figure 57: Lagimodière Blvd at Maginot St – 2030 PM full Build Out with Mitigation Measures....81

Figure 58: Intersection of Marion St and Nicolas Ave 83
Figure 59: Marion St & Dupuy Ave Existing Intersection Configuration 86
Figure 60: Marion St and Louis Riel Way/Dupuy Ave Proposed Signalized Intersection Configuration 88
Figure 61: Maginot St and Speers Rd Existing Intersection Configuration 94

LIST OF APPENDICES

Appendix A Transportation Engineering Background Information
Appendix B 2019 Traffic Volumes
Appendix C Mode Share Reduction Traffic Volume Analysis
Appendix D Vistro Traffic Analysis Reports
Appendix E RA Traffic Analysis Reports

1.0 INTRODUCTION

1.1 BACKGROUND

Olexa Developments (7319829 Manitoba Ltd) has retained Stantec Consulting Ltd. (Stantec) to complete a Traffic Impact Study (TIS) for the proposed development to be located on the south side of Marion Street between Dawson Road and Archibald Street, comprising the Major Redevelopment Site D as defined in *OurWinnipeg*. Major Redevelopment Sites are defined in this document as *"Large, functionally obsolete or underutilized lands, such as former industrial areas. They are often located adjacent to existing communities along rail lines, major corridors or rapid transit corridors. Although existing infrastructure is often insufficient for immediate redevelopment, these areas present opportunities for strategic mixed-use infill and intensification in existing urban areas".*

1.2 OBJECTIVES

The TIS will have the following purposes:

- Estimate the trips generated by the development and distribute them to the adjacent transportation network
- Determine current transportation network characteristics and identify deficiencies based on forecast background growth
- Determine any additional impacts on the adjacent transportation network and infrastructure resulting from trips generated by the proposed development
- Identify offsite improvements required due to new trips from the proposed development to maintain safe and efficient operation of the adjacent road network at current levels of service.
- Determine infrastructure needs to support active modes and transit service enhancements
- Determine infrastructure needs within the development to support transportation requirements based on current City Policy documents

2.0 CONTEXT

2.1 LOCATION

The proposed development is to be located in the Northeast area of the City of Winnipeg. The development area is bounded by Marion Street to the North, the Emerson CPR line to the West, the CN Sprague line to the East and the CNR (Canadian National Railway) Paddington yards to the South.

Figure 1 shows the proposed development site in the regional context.



Figure 1: Regional Context

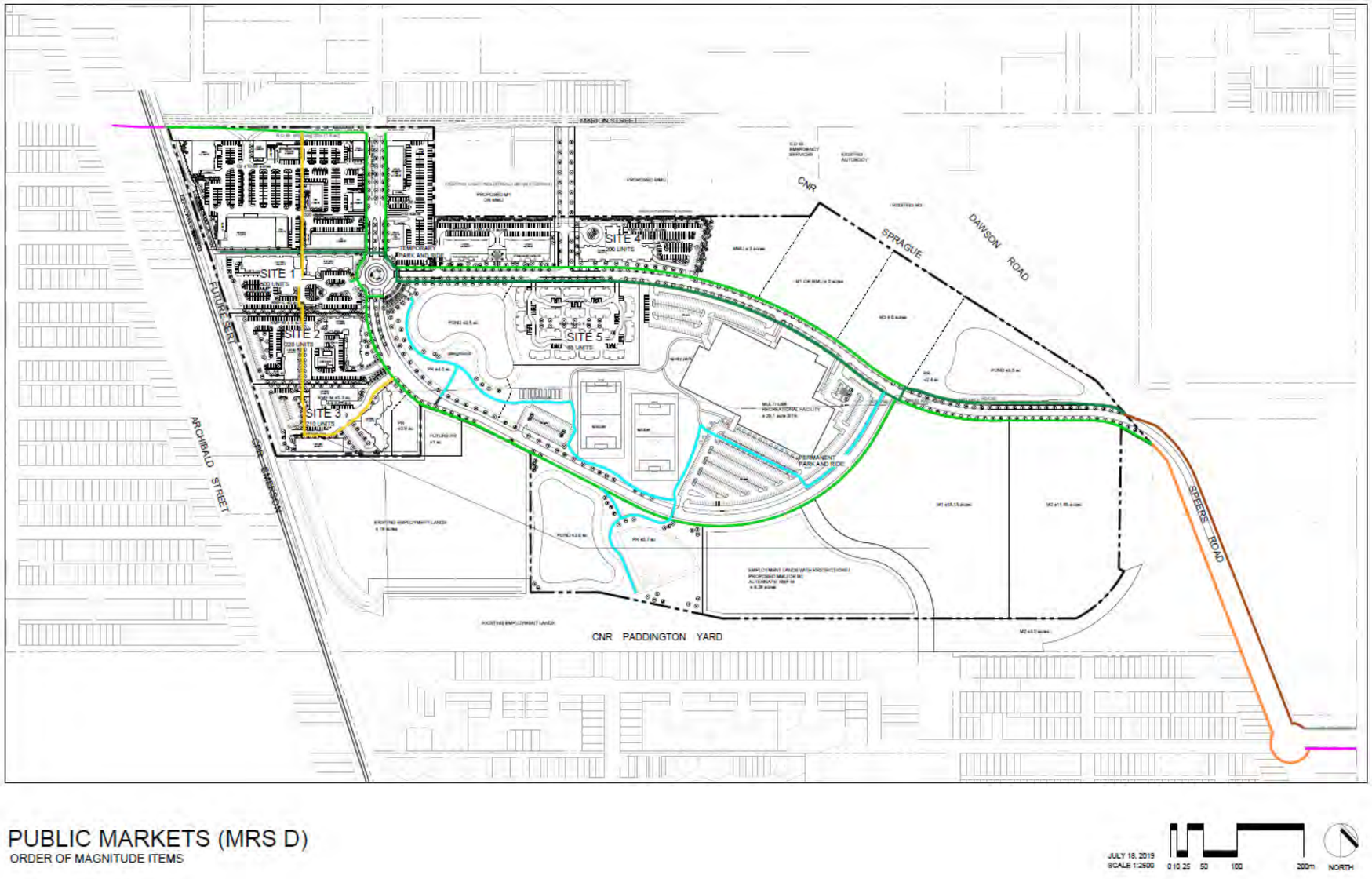
2.3 PROPOSED LAND USE

The development site covers approximately 222 acres. Proposed land uses include:

- 10.55 acres of commercial land use
- 3.29 acres of mixed commercial/office land use
- 3.3 acres mixed office/residential (town house) land use
- 24.7 acres of multifamily (mid-rise) residential homes
- 29 acres multi-use recreational
- 49.1 acres of mixed office/ general light industrial

Figure 2 on the following page shows the proposed site layout.

Figure 2: Public Markets (MRS D) Conceptual Development Plan



2.4 EMERGENCY VEHICLE ACCESS CONCERNS

Below is a summary of measures intended to address accessibility, safety and emergency service access and response to the proposed development. These measures are presented to address concerns brought up at a meeting held on January 11, 2019 by the Winnipeg Fire Paramedic Service (WFPS). This meeting was attended by representatives of various City departments, including the Winnipeg Fire Paramedics Service (WFPS).

The following measures and initiatives, either by Olexa Developments or by The City of Winnipeg (City), are intended to mitigate unnecessary risk associated with the location of this development and are intended to be consistent with Sustainable Cities and Communities' framework.

2.4.1 Train Activity Detection at Railway Crossings on Marion Street

2.4.1.1 Train Detection and Real-Time Data Integration

Since 2017 and as part of the Smart Cities initiatives, there have been discussions between Public Works and WFPS departments to deploy train detection and activity sensors at the Marion Street railway crossings (CN and CP) to relay train blockage information to the WFPS' Computer Aided Dispatch system. This information would help emergency responders select the correct direction (from the east or from the west) of travel when approaching the development site in case of an emergency call. A business case and plans were already underway to implement this initiative, which when implemented, will set the bar for best practice in emergency response initiatives across North America.

This technology has been successfully implemented locally on Waverley Street as part of the Waverley Street Underpass project. The technology consists of sensors located at or near the railway crossing to detect the presence of trains and estimate the duration of the blockage caused by the train. This information is then relayed to potential interested users. In the case of the Waverley Street Underpass project, the information is relayed to a variable message board facing motorists on Waverley Street, and to the City's Transportation Management Centre (TMC). With respect to Waverley, The TMC is able to relay the information to others via social media (as it does now) and to the WFPS. With respect to the MRS D proposed development scenario, the information can be sent directly to the Computer-Aided Dispatch (CAD) system to inform them of blockages and delay. Furthermore, the data can be posted to Waze, an app that facilitates routing in real-time for users based on traffic conditions.

Information enhancements are possible by incorporating dedicated traffic cameras capable of providing real-time video to WFPS to provide visual confirmation of incidents (not just train blockages) that may affect their ability to attend an emergency call.

This can be accomplished by leveraging current capabilities of the City's TMC and incorporating the enhanced data with the WFPS CAD system.

2.4.2 Sustainable Cities and Communities - Resilient Cities

According to the OECD, urban resiliency refers to Cities having the ongoing capacity to absorb, adapt, transform and prepare for shock and stresses that are brought by the economy, society, institutions or the



environment; with the purpose of maintaining functions of a city and improving the response for future shocks and stresses. These principles create a framework for communities to manage sustainability, improve sustainable development, and assess the progress of communities as part of their development.

2.4.2.1 Sustainable Transportation

The development is being planned with the ability to facilitate and support sustainable transportation by providing walking trails and sidewalks for pedestrians, cyclists, and including the potential accommodation of a 100-stall transit park and ride facility, with the location subject to further review. Facility designs associated with the development are considered to be Transit service friendly. This commitment to design that is multimodal mobility friendly will provide accessibility choices to people of all ages and abilities.

Furthermore, this development is located at a strategic place to take advantage of a high frequency Transit routes, as well as positioning itself for improved service to downtown and educational institutions such as College St Boniface and Red River College; making this a potential true transit-oriented development.

In addition, Olexa Developments has considered opening the conversation with relevant railway companies to potentially adjusting their operations abutting lands immediately south of the development lands. There could be mutual benefits to adjusting this operation. A portion or all these operations could be relocated to a place that is more efficient for the railway company, which could help reduce their operating cost. This in turn could help improve access to the development from its current situation. While these discussions are still for consideration, it is worth noting the potential benefits and interest for Olexa Developments to establish this development as a resilient community.

2.4.3 Sprinkler System

The residential component of the development consists exclusively of multifamily units that are required to include a sprinkler system. This is also a requirement for the commercial and industrial structures to address fire hazards. This initiative will reduce the stress and shock associated with reacting to real threats such as fire-related emergencies. This will help reduce the risk and magnitude associated with loss of life and property as a result of fire emergencies.

2.4.4 Emergency Services Within the Development

A third initiative under consideration includes the ability to accommodate emergency services within the development. This type of initiative is not uncommon and can be incorporated seamlessly as part of the existing development. This accommodation can be done in a fashion similar to what has been done in other cities such as Calgary's Royal Vista multi-facility complex, which includes a fire hall (Fire Hall 34) or Vancouver's Fire Hall 5, which is part of a high-rise building.

Integrating a fire hall within the development in a seamless manner would ensure an enhanced level of service not only for the development itself, but also to the immediate area. Having the information associated with train blockages would allow fire response teams to choose the most efficient way to depart from the fire hall and be on site in the most expeditious manner. This would be significantly more



efficient that the current method, which does not have the tools or information in real-time to adjust travel routes based on the current traffic congestion activity.

2.4.5 Summary

The implementation of initiatives proposed by Olexa Developments and initiatives that have been under discussion within the City, will result in a progressive and unique kind of development that can showcase best practices and ideas that support the framework associated with Sustainable Cities and Communities. From integrating a fire hall within the development to implementing smart city initiatives such as train detection for real-time travel routing, to creating a transit-oriented development to support active transportation and transit services compatible with transit initiatives, this development is setting itself as one of the most progressive and sustainable developments in Winnipeg.

2.5 ADJACENT SITES / ROADWAY CONDITIONS

2.5.1 Land Use

Adjacent land use currently consists of industrial lands to the north and east, single family homes to the south and commercial, single family homes, multifamily homes and Happyland Park to the west. A Southeast Rapid Transit Corridor has been proposed to be located along the CPR Emerson right-of-way. This enhanced transit service is being reviewed through the Transit Master Plan. Some form of enhanced transit service to preserve the Transit focus of this development will be available

2.5.2 Transportation

Table 1 shows the characteristics of the roads near the proposed development.

Table 1: Study Area Street Characteristics

Road	Functional Classification	Basic Cross Section	Posted Speed Limit
Archibald St	Regional Street	4 Lane Undivided	60 km/h
Marion St	Regional Street	4 Lane Undivided	60 km/h
Lagimodière Blvd	Regional Expressway	4 Lane Divided	80 km/h
Dawson Rd	Local Collector	2 Lane Undivided	60 km/h
Maginot St	Local Collector	2 Lane Undivided	50 km/h

2.6 STUDY AREA

The study area is bounded by Marion Street to the north, Archibald Street to the east, Lagimodière Boulevard to the west and Maginot Street to the south. The proposed development includes the completion of the connection of Marion Street and Maginot Street via Speers Rd.

The intersections expected to be most affected by the MRS D development were selected as study intersections and include:

- Marion St and Archibald St
- Marion St and Nicolas Ave
- Marion St and Dawson Rd
- Marion St and Panet Rd
- Marion St and Lagimodière Blvd
- Lagimodière Blvd and Maginot St
- Maginot St and Speers Rd

The study area and is shown in Figure 3.

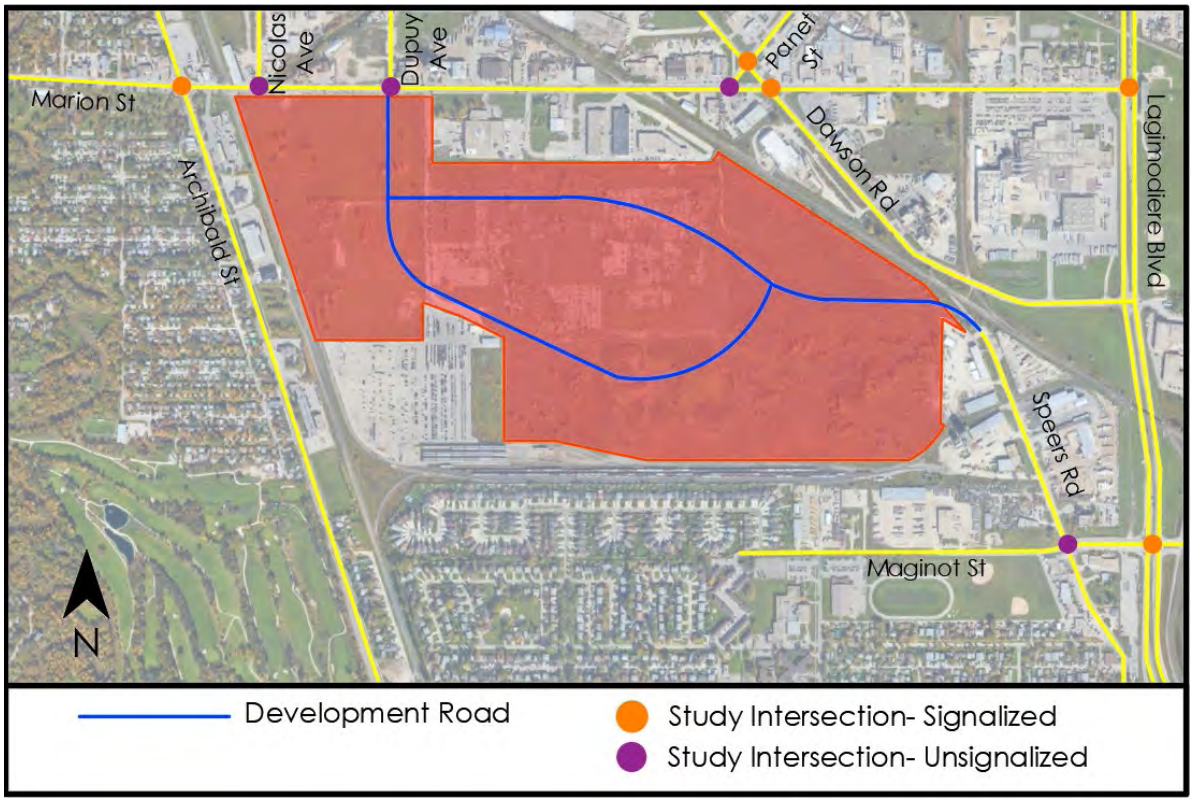


Figure 3: Study Area

2.7 HORIZON YEARS AND TIME PERIODS FOR ANALYSIS

The proposed development is anticipated to be 100% built out by 2030 (approximately 10 years). A partial build-out scenario in 2025 has also been analyzed. The development progress assumptions made for the partial build out scenario include:

- Commercial development 75% complete
- Office Development 75% complete
- Residential development 50% complete
- Light industrial development 50% complete
- Recreational Development 0% complete
- Connection of development to intersection of Speers Rd and Maginot St not yet complete

The full list of analysis scenarios chosen by the study team are as follows:

- 2019 Existing Conditions
- 2025 Background Growth Only
- 2025 Background Growth + Partial Build Out
- 2030 Background Growth Only
- 2030 Background Growth + Full Build Out



3.0 TRAFFIC VOLUMES

3.1 EXISTING TRAFFIC VOLUMES

Existing (2019) traffic volumes were based on a combination of existing traffic counts obtained from the City of Winnipeg and traffic counts conducted by Stantec in 2019. City of Winnipeg traffic count data was used for the following intersections:

- **Lagimodière Blvd and Marion St**
  Thursday November 6, 2014
  From 7:00 to 9:00 AM and 12:00 to 6:00 PM

- **Lagimodière Blvd and Maginot St**
  Wednesday March 9, 2016
  From 7:00 to 9:00 AM and 3:30 to 5:30 PM

Traffic growth projections (described in Section 3.2) were used to bring the 2014 and 2016 traffic volumes to 2019 levels.

Updated traffic counts were conducted by Stantec at the following intersections:

- **Archibald St and Marion St**
  Tuesday May 7, 2019
  From 6:00 AM to 6:00 PM

- **Dawson St and Marion St**
  Tuesday May 14, 2019
  From 6:00 AM to 6:00 PM

- **Dupuy St and Marion St**
  Tuesday May 21, 2019
  From 6:00 AM to 6:00 PM

- **Marion St and Nicolas Ave**
  Wednesday, May 8, 2019
  From 6:00 AM to 6:00 PM

- **Panet St and Dawson St**
  Thursday, May 16, 2019
  From 6:00 AM to 6:00 PM

- **Maginot St and Speers Rd**
  Wednesday, May 22, 2019
  From 6:00 AM to 3:00 PM
  Thursday, May 23, 2019
  From 3:00 PM to 6:00 PM



All count data was provided in 15-minute intervals. To be consistent, the same AM and PM peak hour timeframe was used for all intersections. The AM peak hour was taken as 7:30-8:30 AM while the PM peak hour was taken as 4:30 to 5:30 PM. These time frames were chosen based on the most common peak hour ranges observed at each count, which ranged from 7:15 to 8:45 AM and 3:15 to 5:00 PM in the AM and PM peak hours respectively.

A separate count was not conducted at the unsignalized intersection of Marion & Panet due to its proximity to the intersections of Dawson & Panet and Dawson & Marion for which updated counts were conducted (locations shown on Figure 4) . Instead, traffic volumes at Marion & Panet were determined by balancing the volumes obtained from the aforementioned counts, as summarized in Table 2.

Table 2: Marion St and Panet St Volume Calculations

Movement at Marion & Panet	Volume calculations
Southwestbound right	SWB left + NWB left + SEB right at Panet & Dawson
Eastbound left	Sum of all NEB volumes at Panet & Dawson
Eastbound thru	Sum of all EB volumes at Marion & Dawson
WB thru	WB thru + NWB left + SWB right at Marion & Dawson
WB right	Assumed to be 0.



Figure 4: Intersections of Marion St and Panet Rd and Dawson Rd

Figure 5 shows the 2019 existing traffic conditions at the study intersections.

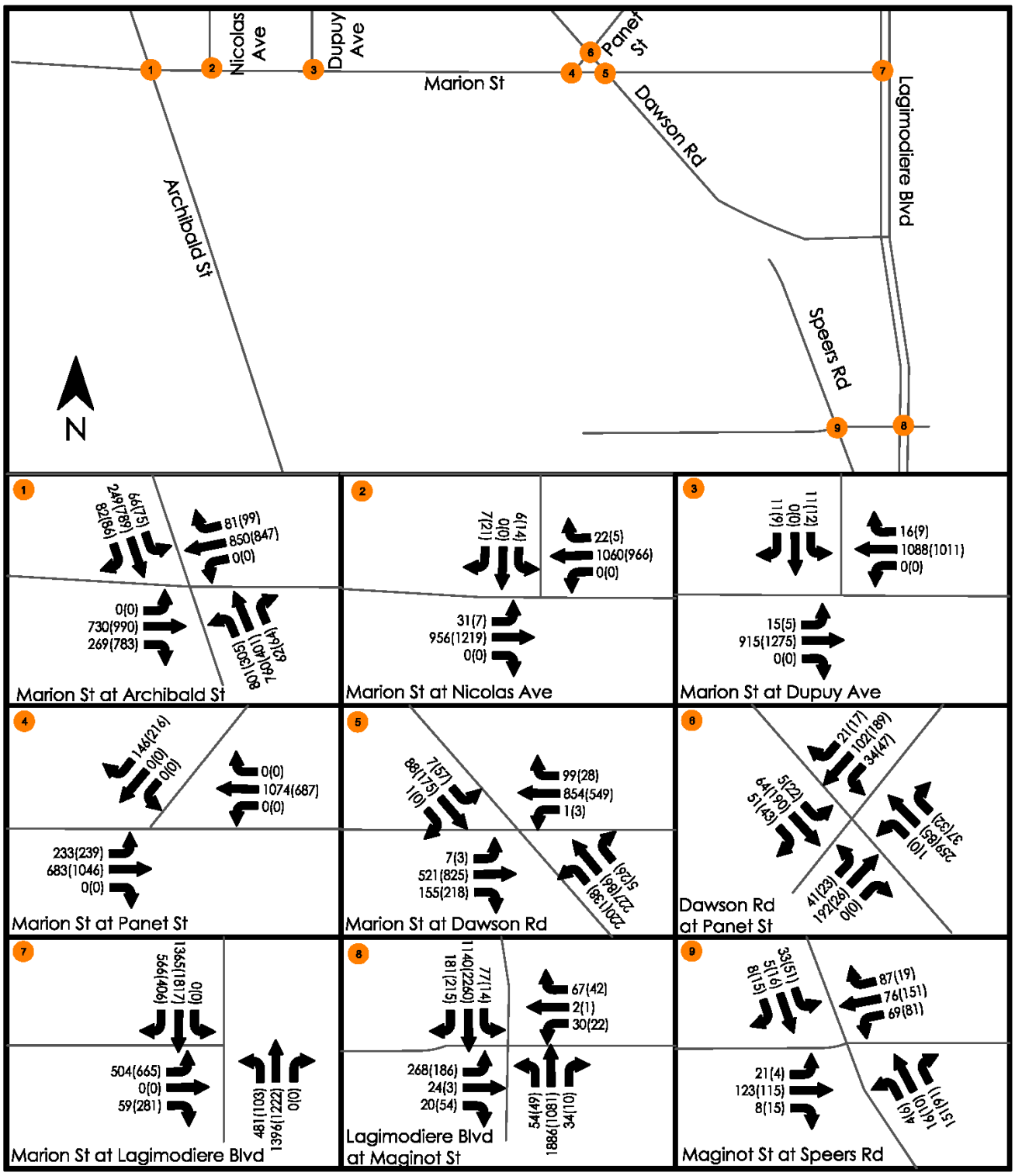


Figure 5: 2019 Existing Conditions - AM Peak (PM Peak)

3.1.1 Peak Hour Factors and Heavy Vehicles

The peak hour factor (PHF) represents the fluctuation of traffic flow within the peak hour. PHF is defined as:

$$PHF = \frac{Peak\ Hour\ Volume}{Peak\ 15\ Minute\ Volume\ \times 4}$$

Notice that lower PHFs indicate that more of the peak hour volume occurs within the peak 15 minutes, while higher PHFs indicate a more consistent flow within the peak hour. Volume fluctuation within the peak hour depends on many factors, and thus is difficult to predict into the future. As such, observed PHFs were used for analysis of the 2019 Background scenario, and PHFs for future scenarios were set to a typical value of 0.92. The only exception was the intersection of Marion & Archibald which had an observed PHF of 0.85 in the PM peak hour. This PHF was considered to be unrepresentative of typical conditions due to current construction occurring on Fermor resulting in trips being re-routed to Marion. Therefore, the PHF for Marion & Archibald was also set to a typical value of 0.92 in the PM Peak existing conditions scenario.

Heavy vehicle percentages at existing intersections were set for individual movements based on observed field values for existing conditions and background growth scenarios. For the full and partial build out scenarios heavy vehicle volume percentages were set to a typical value of 2%. The west bound Marion truck traffic approaching Archibald is 4% of traffic in the AM, and 2% in the PM. This percentage will change as commuter traffic decreases during non-peak traffic hours. The change from 2% to 4% truck traffic translates to approximately 19 more trucks per hour for the WB through movement. The other movements have truck percentages ranging from 0% to 13% but the maximum volume of trucks remain below 20 trucks per hour for any movement. Under the most conservative scenario, this increase in truck traffic does not impact LOS to any great degree. This adjustment was made because the new development generated traffic using the Marion and Archibald intersection is mainly residential and commercial traffic, as opposed to the industrial traffic that is currently more common in the study area. New industrial traffic is expected to be distributed primarily to Lagimodiere or Panet.

3.1.2 Future Background Traffic

Future background traffic for the 2025 and 2030 scenarios was calculated using an annual growth rate of 1.4%. This growth rate was determined based on the average of actual observed growth rates at intersections where both past count data and updated 2019 data was available, which include:

- Marion St & Archibald St (2013 to 2019)
- Marion St & Dawson Rd (2012 to 2019)
- Marion St & Panet St (2012 to 2019)

The 2025 and 2030 background traffic volumes at the study intersections are shown in Figure 6 and Figure 7 respectively.



The City of Winnipeg's Transportation Model shows anticipated traffic growth rates closer to 0.5% per year on Marion and closer to 1.5% on Lagimodiere Blvd. Using the higher Growth rate is the more conservative approach.

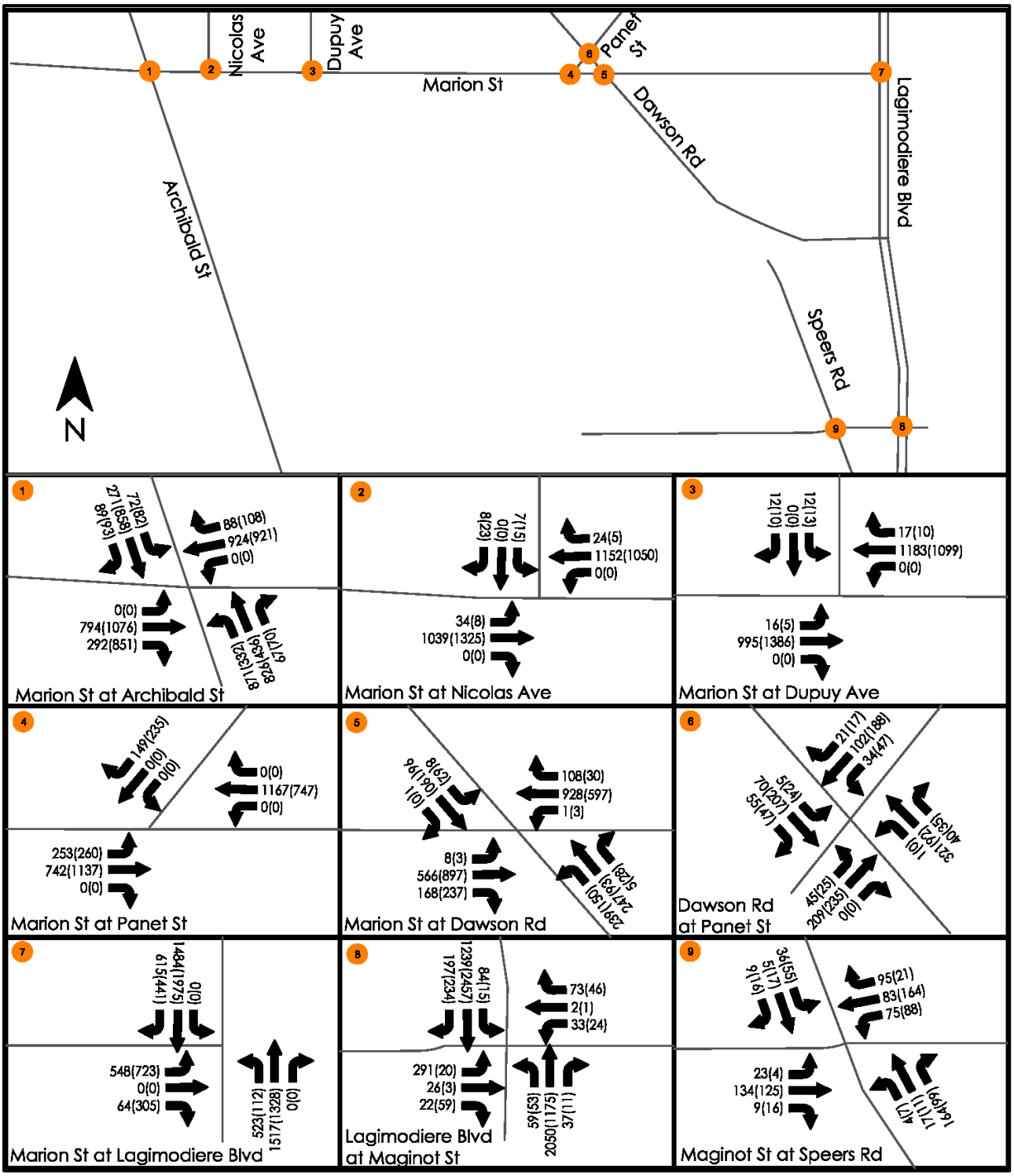


Figure 6: 2025 Background Growth - AM Peak (PM Peak)

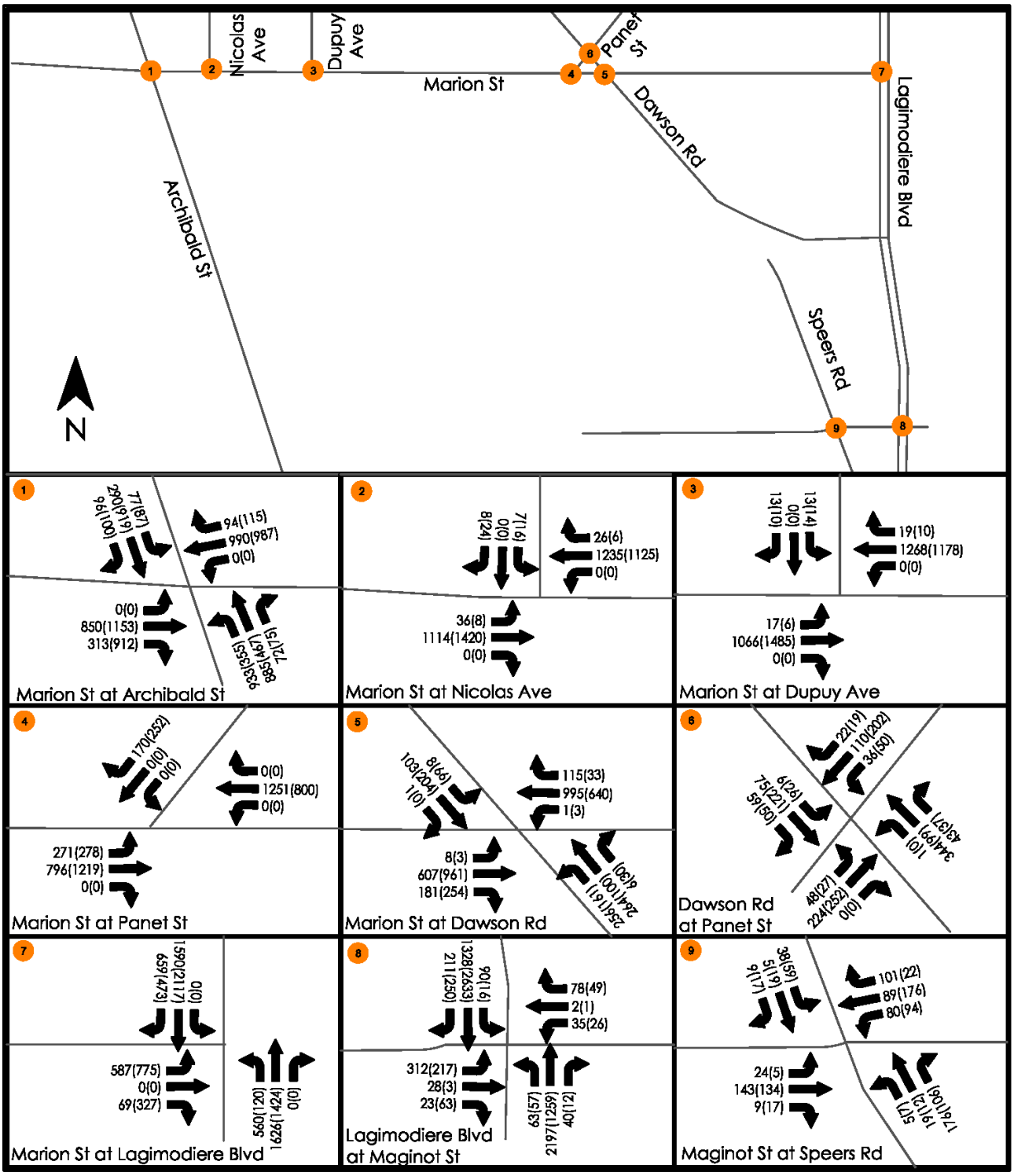


Figure 7: 2030 Background Growth - AM Peak (PM Peak)

3.2 DEVELOPMENT GENERATED TRAFFIC

3.2.1 Trip Generation

Trip generation estimates have been developed using data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition.* The *Trip Generation Manual* includes trip generation rates for a variety of land uses for different time periods, based on development size, occupancy or other features.

Table 3 shows the trip generation for the partial build out scenario which includes 75% of the commercial and mixed-use commercial/office development, 50% completion of the residential development and 50% completion of the general light industrial development.

Table 3: Trip Generation – Partial Build Out

ITE Land Use (Land Use Code)	Land Use Quantity	Time Period	Trip Generation Rate	Trip Generation Estimate
Shopping Center (820)	102.5 (1,000 Sq. Ft. Gross Floor Area)	AM PM ADT	0.94 3.81 37.75	96 (60 in, 36 out) 391 (188 in, 203 out) 3870 (1935 in, 1935 out)
Multifamily Housing Mid-Rise (221)	600 dwellings	AM PM ADT	0.36 0.44 5.44	216 (56 in, 160 out) 264 (160 in, 104 out) 3264 (1632 in, 1632 out)
Multifamily Housing Low-Rise (220)	8 dwellings	AM PM ADT	0.46 0.56 7.32	4 (1 in, 3 out) 5 (3 in, 2 out) 58 (29 in, 29 out)
General Office Building (710)	100 (1,000 Sq. Ft. Gross Floor Area)	AM PM ADT	1.16 1.15 9.74	116 (100 in, 16 out) 114 (18 in, 96 out) 974 (487 in, 487 out)
General Light Industrial (110)	141 (1,000 Sq. Ft Gross Floor Area)	AM PM ADT	0.70 0.63 4.96	99 (86 in, 13 out) 89 (11 in, 78 out) 700 (350 in, 350 out)
			Partial Build Out Total	531 (303 in, 228 out) 863 (380 in, 483 out) 8866 (4433 in, 4433 out)

Table 4 shows the trip generation for the full build out scenario which includes 100% completion of commercial, office, residential, recreational and light industrial development. As per the site plan, the recreational development area is expected to consist of a recreational community centre, a soccer complex, tennis courts and a ballpark.

Table 4: Trip Generation – Full Build Out

ITE Land Use (Land Use Code)	Land Use Quantity	Time Period	Trip Generation Rate	Trip Generation Estimate
Shopping Center (820)	137.5 (1,000 Sq. Ft. Gross Floor Area)	AM PM ADT	0.94 3.81 37.75	129 (80 in, 49 out) 523 (251 in, 272 out) 5190 (2595 in, 2595 out)
Multifamily Housing Mid-Rise (221)	1226 dwellings	AM PM ADT	0.36 0.44 5.44	441 (115 in, 326 out) 539 (329 in, 210 out) 6668 (3334 in, 3334 out)
Multifamily Housing Low-Rise (221)	16 dwellings	AM PM ADT	0.46 0.56 7.32	8 (2 in, 6 out) 9 (6 in, 3 out) 118 (59 in, 59 out)
General Office Building (710)	132.5 (1,000 Sq. Ft. Gross Floor Area)	AM PM ADT	1.16 1.15 9.74	154 (132 in, 22 out) 152 (24 in, 128 out) 1290 (645 in, 645 out)
Recreational Community Center (495)	281 (1,000 Sq. Ft. Gross Floor Area)	AM PM ADT	1.76 2.31 28.82	494 (326 in, 168 out) 649 (305 in, 344 out) 8098 (4049 in, 4049 out)
Soccer Complex (488)	2 fields	AM PM ADT	0.99 16.43 71.33	2 (1 in, 1 out) 33 (22 in, 11 out) 142 (71 in, 71 out)
General Light Industrial (110)	242 (1,000 Sq. Ft. Gross Floor Area)	AM PM ADT	0.7 0.63 82	374 (328 in, 46 out) 336 (43 in, 293 out) 2648 (1324 in, 1324 out)
			Full Build Out Total	1602 (984 in, 618 out) 2241 (980 in, 1261 out) 24154 (12077 in, 12077 out)

3.2.2 Mode Split Adjustments

The proposed development site meets the proposed criteria for Transit Orientated Development. It is located adjacent to the proposed Southeast Rapid Transit Corridor identified in the existing Council-approved planning documents *OurWinnipeg* and the *Transportation Master Plan*. The Transit Master Plan, currently under way for the City of Winnipeg, is being developed in consideration of this development. There is consideration for Frequent Transit lines that could pass through or adjacent to this development. The Frequent on-street transit service will connect directly to the University of Manitoba, Downtown and the employment areas of St. Boniface. These routes also cross other frequent /rapid routes, providing convenient and efficient access to all areas of the City.

There is no existing bike infrastructure along the sections of Marion St and Lagimodière Blvd bordering the development site. The closest active transportation route consists of a multi-use path along Archibald St ending 750 m south of the intersection at Marion St. Access to downtown is provided by a neighborhood greenway through St. Boniface, crossing the Seine River using the Tremblay Bridge. The



Winnipeg Pedestrian and Cycling Strategy proposes further infrastructure along the remainder of Marion St and Dawson Rd to better connect this area towards downtown and other areas of the City.

With consideration of the developing Frequent/Rapid Transit Network and general improvements to Transit service and reliability, better connectivity via active route network completion and increased awareness of environmental impact of single occupant vehicles***, it is anticipated, based on experience in other jurisdictions, that new developments located near or serviced by Frequent and Rapid transit services will attract transit mode share in the 20% to 30% range***. However, as the future proposed rapid transit corridor and active transportation infrastructure are not yet in place, a conservative 10% modal split reduction was applied to all trip generation estimates for this report. This modal split is based on normally accepted values by the City. Existing city-wide transit usage accounts for approximately 6% of all trips. The 10% modal split assumes, based on proximity to existing transit routes, increased transit usage and some trips occurring via active transportation, rather than vehicular modes. Reducing the total trip generation by 10% to account for modal split gives the following trip generation totals:

- Partial Build Out Scenario:
    - AM: 478 (273 in, 205 out)
    - PM: 777 (342 in, 435 out)
    - ADT: 7,890 (3,990 in, 3,990 out)
- Full Build Out Scenario:
    - AM: 1,442 (886 in, 556 out)
    - PM: 2,017 (882 in, 1,135 out)
    - ADT: 21,738 (10,869 in, 10,869 out)

While a higher mode split for transit use is likely due to the proximity of anticipated enhanced transit service under development in the Transit Master Plan. At this time, it has not been applied due to the preliminary nature of the Transit Master Plan project. With the anticipated transit service provided through changes being considered in the Transit Master Plan, a 30% mode share for transit for some aspects of the development traffic is not unreasonable.

The proposed changes to the transit system are also anticipated to increase overall transit use throughout the city, slowing down the background growth in traffic. As noted, the current analysis assumes a mode split reduction of 10%, however if the changes in the transit system increase this mode share to 15%, 20% or 30%, the reduction in existing vehicle trips entering the study intersections would be 5.6%, 11% and 22% respectively. The reductions in background vehicle trips was calculated by reducing the projected traffic by the incremental mode share expected. Adjusted background growth and site generated traffic volumes that show the effect of a potential increase in mode share are presented in Appendix C.



Table 5 provides the potential impact on total trip generation assuming modal split reductions of 15%, 20% and 30%. While significant, these values are provided for information purposes only, the traffic analysis has been performed assuming a 10% modal reduction and no reduction to background traffic.

Table 5: Effect of Further Mode Share Reductions

Mode Share Reduction	Time Period	Partial Build Out Scenario	Full Build Out Scenario
15%	AM PM ADT	452 (258 in, 194 out) 734 (323 in, 411 out) 7536 (3768 in, 3768 out)	1361 (836 in, 525 out) 1905 (833 in, 1072 out) 20530 (10265 in, 10265 out)
20%	AM PM ADT	424 (242 in, 182 out) 690 (304 in, 386 out) 7092 (3546 in, 3546 out)	1281 (787 in, 494 out) 1793 (784 in, 1009 out) 19324 (9662 in, 9662 out)
30%	AM PM ADT	372 (212 in, 160 out) 604 (266 in, 338 out) 6206 (3103 in, 3103 out)	1122 (689 in, 433 out) 1569 (686 in, 883 out) 16908 (8454 in, 8454 out)

3.2.3 Internal Capture

For a development site consisting of two or more land uses (i.e. a mixed-use development) such as MRS D, there is potential for interaction among the different land uses. A key characteristic of a mixed-use development is that trips can be made between the different land uses without using the external street system. This is referred to as internal capture. Per Chapter 6 of the ITE trip generation handbook, an internal capture rate is defined as the percentage of total person trips generated by a site that are made entirely within the site. The trip, origin, destination, and travel paths are all within the site. When internal capture is present, the result is that the total external trip generation is less than the simple sum of the trips generated by each land use.

The internal capture rates for the proposed development have been calculated using the process outlined in Chapter 6 of the ITE Trip Generation Handbook, which is consistent with the recommended procedure presented in NCHRP Report 684: *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.* The procedure only provides internal capture rates for the following generic land use categories: office, retail, restaurant, resident, hotel, and cinema entertainment. Therefore, for the full build out scenario, which includes recreational development, a 10% internal capture rate was applied for the PM peak scenario (0% assumed in AM peak) based on engineering judgement. No internal capture was applied to the “general light industrial” land uses.

The internal capture rates used for each of the analysis scenarios are summarized in Table 6 and Table 7. Note that the internal capture rate has been applied after the 10% mode split reduction, therefore all internal trips were assumed to be vehicle trips. These trips have been included in the traffic analysis of the development site internal intersections.



Table 6: Internal Capture Rates - Partial Build Out Scenario

Generic Land Use	ITE Land Use	Internal Trip Capture Percentages			
		AM		PM	
		Entering	Exiting	Entering	Exiting
Retail	Shopping center (820)	9%	17%	3%	15%
Residential	Multi-family mid-rise (221)	3%	3%	17%	7%
Office	General office building (710)	8%	31%	51%	5%

Table 7: Internal Capture Rates - Full Build Out Scenario

Generic Land Use	ITE Land Use	Internal Trip Capture Percentages			
		AM		PM	
		Entering	Exiting	Entering	Exiting
Retail	Shopping center (820)	13%	16%	3%	15%
Residential	Multi-family mid-rise (221) Single family detached (210)	2%	2%	11%	5%
Office	General office building (710)	7%	29%	58%	5%
Recreational	Recreational community center (495) Soccer complex (488)	0%	0%	10%	10%

3.2.4 Pass-By Trips

Vehicle trips generated by a site can be separated into two major categories: pass-by trips and non-pass-by trips. Pass-by trips are defined as trips made as an intermediate trip between an origin and primary destination. Pass-by trips are attracted from existing traffic passing the site on adjacent street and do not require diversion from another roadway. Retail sites such as shopping centers, discount stores, restaurants, banks, service stations, and convenience markets can attract a portion of their trips from motorists already on the adjacent street system. Such “pass-by” trips do not add new traffic to the adjacent street system and may be reduced from the total external trips generated by a study site.

Only the commercial land uses in the proposed development are considered to attract pass-by trips. A pass-by trip percentage of 30% was applied to the trips generated from the proposed Shopping Center land areas in the PM Peak hour. This percentage was based on the fitted curve provided in *Figure E.7 Shopping Center (820)* provided in Appendix E: Database on Pass-By, Diverted, and Primary Trips of the ITE Trip Generation Handbook. The pass-by trips have been reallocated from adjacent street traffic to routes entering and exiting the shopping center locations based on engineering judgement.

The site generated trips have been split into pass-by and non-pass-by trips after the mode split reduction and internal capture reductions as recommended in Chapter 10 of the ITE Trip Generation Manual.

A summary of internal, external and pass-by trips are provided in Table 8, Table 9, Table 10, and Table 11 for the partial and full build out scenarios.



Table 8: 2025 Partial Build Out – AM Peak Trip Breakdown

AM Peak						
Generic Land Use	Entering			Exiting		
	Internal	External		Internal	External	
		Non-Pass-By	Pass-By		Non-Pass-By	Pass-By
Retail	5	49	0	5	27	0
Residential	1	50	0	4	143	0
Office	7	83	0	4	10	0
Other Land Use	0	77	0	0	12	0

Table 9: 2025 Partial Build Out – PM Peak Trip Breakdown

PM Peak						
Generic Land Use	Entering			Exiting		
	Internal	External		Internal	External	
		Non-Pass-By	Pass-By		Non-Pass-By	Pass-By
Retail	5	115	49	28	109	47
Residential	25	122	0	5	81	0
Office	8	8	0	4	82	0
Other Land Use	0	10	0	0	70	0

Table 10: 2030 Full Build Out - AM Peak Trip Breakdown

AM Peak						
Generic Land Use	Entering			Exiting		
	Internal	External		Internal	External	
		Non-Pass-By	Pass-By		Non-Pass-By	Pass-By
Retail	9	63	0	7	37	0
Residential	2	103	0	8	291	0
Office	9	110	0	6	14	0
Recreational	0	294	0	0	152	0
Other Land Use	0	295	0	0	41	0

Table 11: 2030 Full Build Out - PM Peak Trip Breakdown

PM Peak						
Generic Land Use	Entering			Exiting		
	Internal	External		Internal	External	
		Non-Pass-By	Pass-By		Non-Pass-By	Pass-By
Retail	6	154	66	29	145	62
Residential	37	264	0	9	140	0
Office	13	9	0	5	110	0
Recreational	29	265	0	32	288	0
Other Land Use	0	39	0	0	264	0



3.2.5 Directional Distribution

The directional distribution of external trips was based on new origin-destination data for the months of February, May and August 2018. This data was obtained for the Winnipeg Transit Master Plan project currently underway. The current data confirms the general pattern identified in the 2007 WATS report, but the information is provided in more detail.

The anticipated directional distribution for external trips generated (entering and exiting) by the development in the AM and PM peak periods is summarized in Table 12 below.

Table 12: Directional Distribution for External Trips

	AM		PM	
	From (Entering)	To (Exiting)	From (Entering)	To (Exiting)
Archibald St South	19.4%	13%	13.2%	20%
Marion St West	17.2%	38%	37.1%	14%
Archibald St North	9.9%	7%	5.9%	11%
Lagimodière Blvd North	22%	16%	12%	19%
Lagimodière Blvd South	9.5%	8%	9.6%	11%
Speers Rd South	9.5%	8%	9.6%	11%
Maginot St	9.5%	8%	9.6%	11%
Industrial Destinations	2%	2%	2%	2%
Small Industrial Destinations	1%	1%	1%	1%

The distribution to “industrial” and “small industrial” destinations represents the estimated percentage of trips entering and exiting the following locations within the Study Area:

- Industrial:
    - Nicolas Ave
    - Dupuy Ave
    - Dawson Rd North
    - Panet Rd North
- Small Industrial:
    - Turenne St
    - Holden St
    - Dawson Rd East (access off Lagimodière Blvd)
    - Maginot St East
    - Speers Rd North

The distribution locations listed in this section are shown on Figure 8.

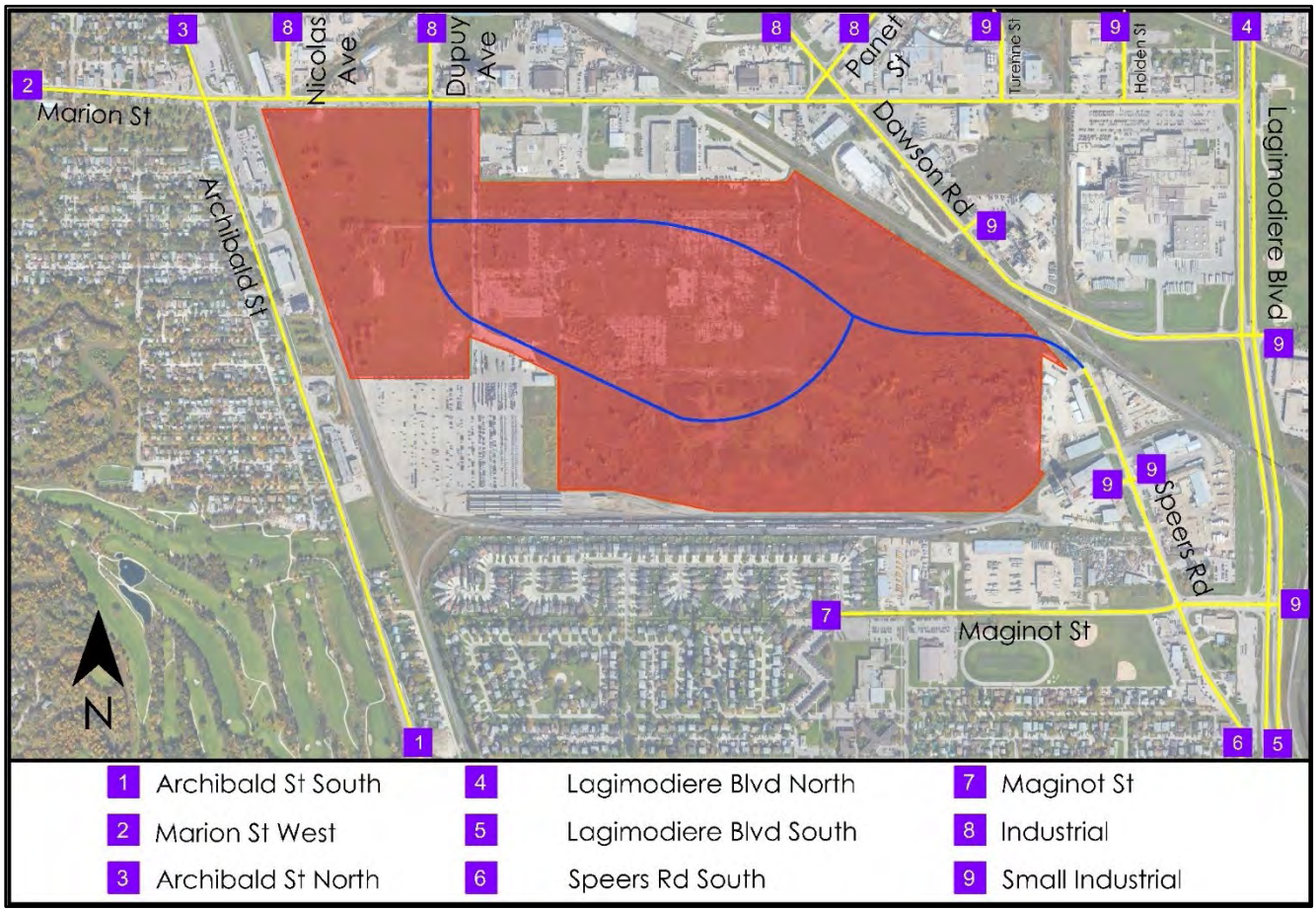


Figure 8: Distribution Locations

3.3 TOTAL FUTURE TRAFFIC

The site generated traffic volumes for the 2025 Partial Build Out Scenario and 2030 Full Build Out scenario are shown in Figure 9 and Figure 10, while the total future traffic volumes for the respective scenarios are shown in Figure 11 and Figure 12.

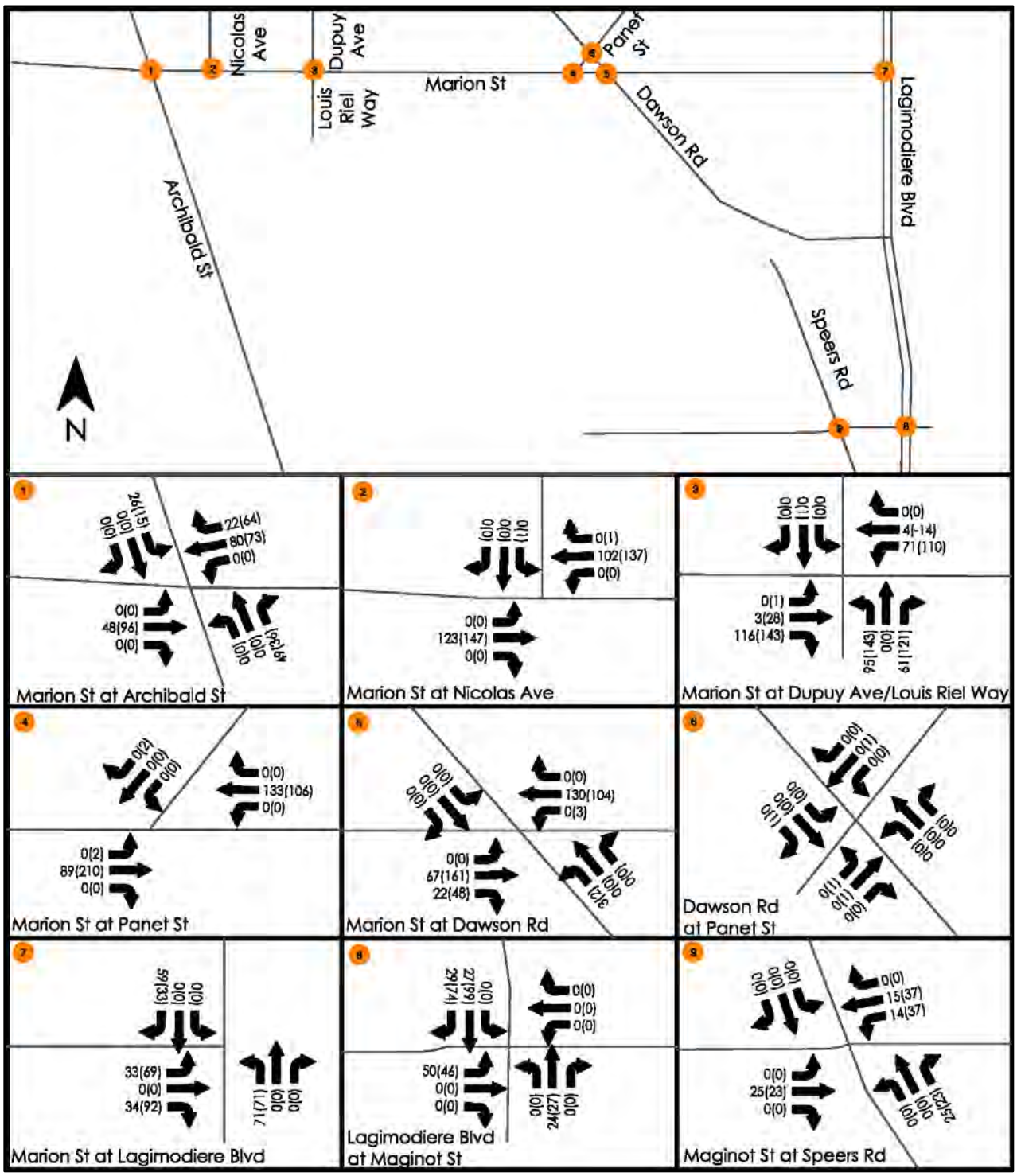


Figure 9: 2025 Partial Build Out Site Generated Traffic Volumes AM Peak (PM Peak)

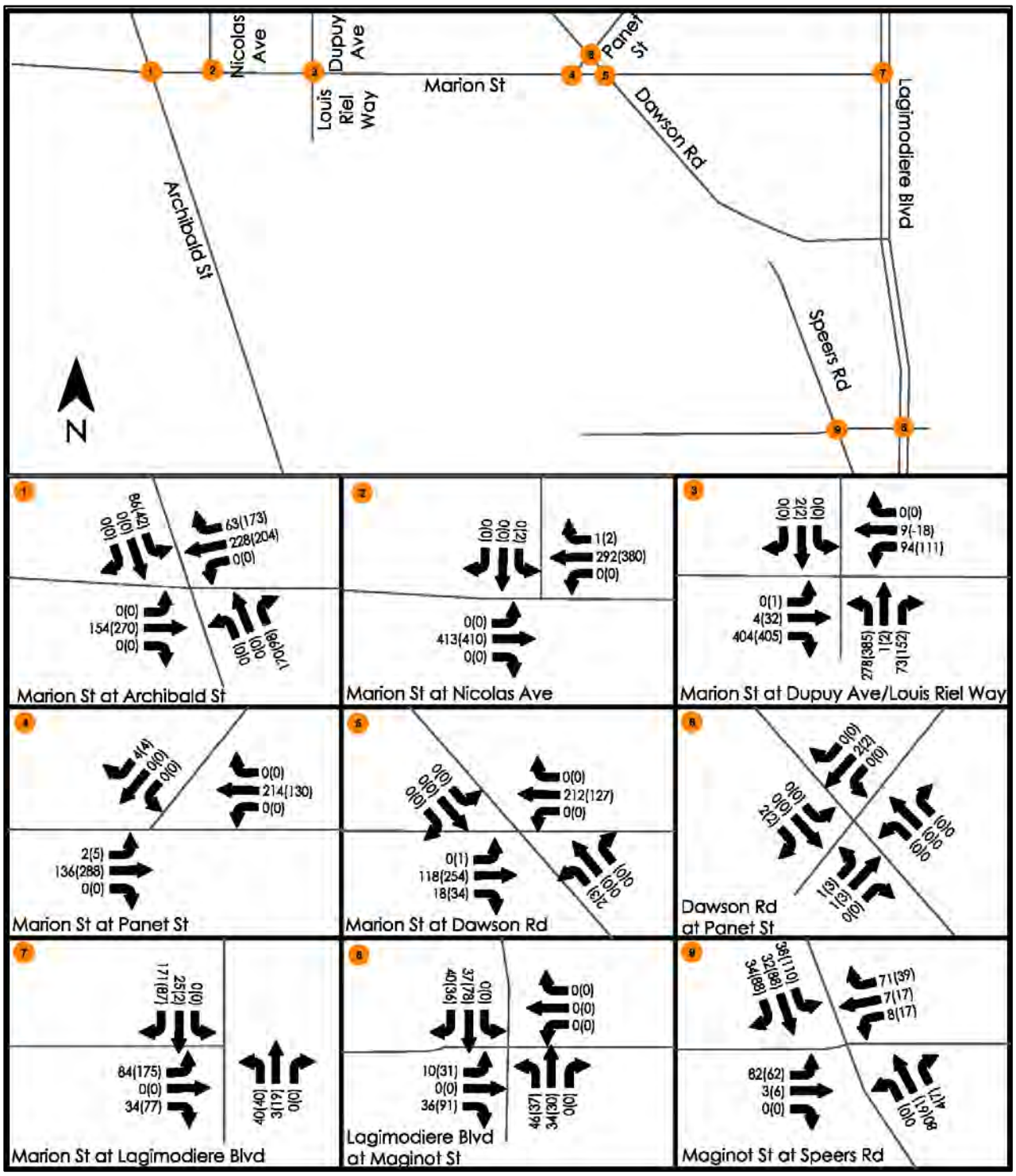


Figure 10: 2030 Full Build Out Site Generated Traffic Volumes AM Peak (PM Peak)

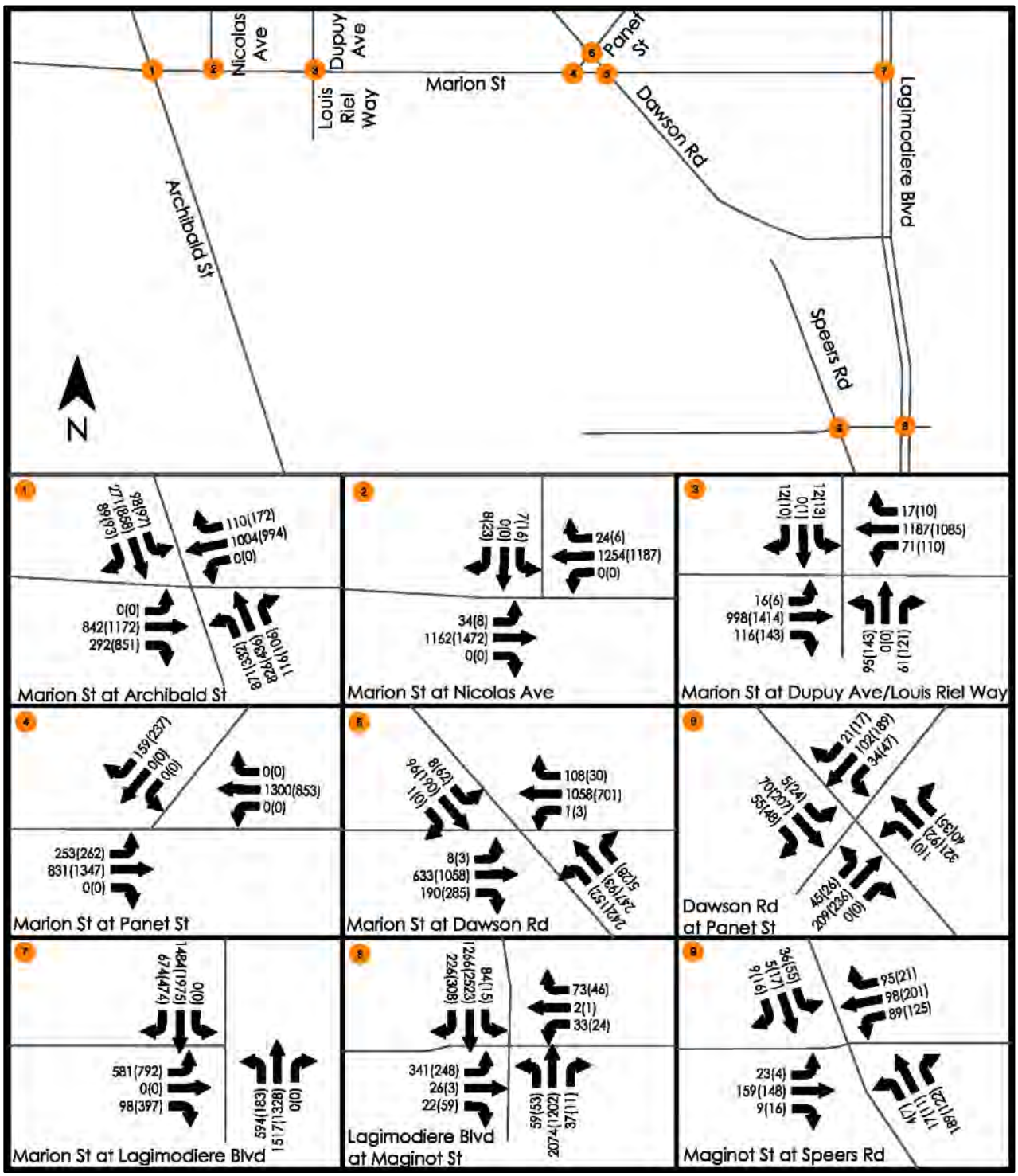


Figure 11: 2025 Partial Build Out Total Future Traffic – AM Peak (PM Peak)

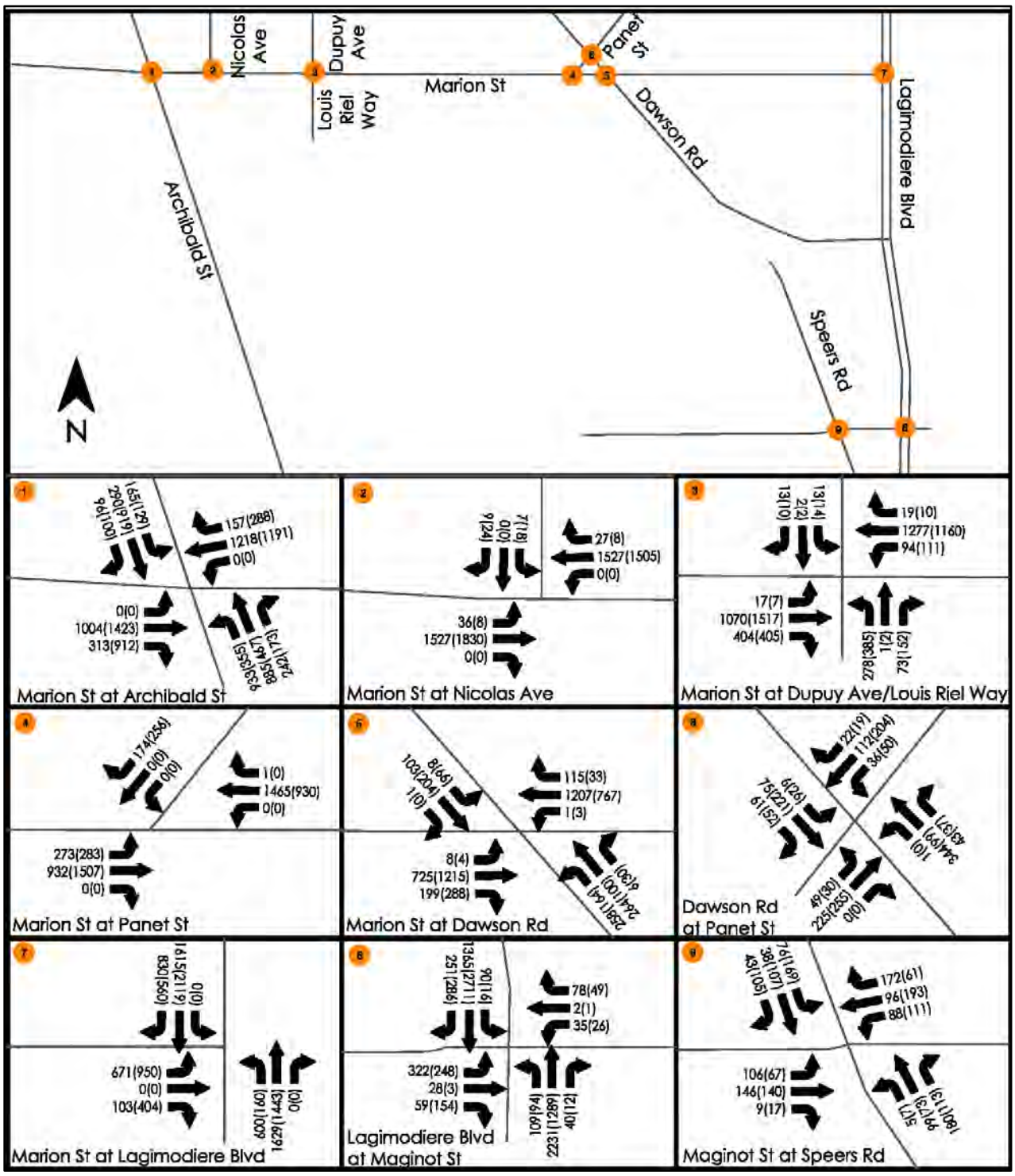


Figure 12: 2030 Full Build Out Total Future Traffic – AM Peak (PM Peak)

Table 13 and Table 14 show the site generated traffic as a percentage of the total future traffic entering each of the study intersections for the partial and full build out scenarios respectively. These percentages may be used as a basis for potential contributions towards infrastructure upgrades.

Table 13: 2025 Partial Build Out - % Site Generated Traffic

Intersection	AM			PM		
	Site Generated	Site Generated + Background Growth	% Site Generated	Site Generated Trips	Site Generated + Background Growth	% Site Generated
Marion St at Archibald St	225	4175	5%	284	4858	6%
Marion St at Nicolas Ave	225	2488	9%	286	2712	11%
Marion St at Dupuy Ave	350	2585	14%	533	3056	17%
Marion St at Panet St	222	2545	9%	320	2698	12%
Marion St at Dawson Rd	222	2597	9%	315	2606	12%
Dawson Rd at Panet St	0	902	0%	4	920	0%
Marion St at Lagimodière Blvd	197	4948	4%	265	5150	5%
Lagimodière Blvd at Maginot St	130	4242	3%	213	4493	5%
Maginot St at Speers Rd	79	732	11%	120	744	16%

Table 14: 2030 Full Build Out - % Site Generated Traffic

Intersection	AM			PM		
	Site Generated	Site Generated + Background Growth	% Site Generated	Site Generated Trips	Site Generated + Background Growth	% Site Generated
Marion St at Archibald St	703	4754	15%	787	5477	14%
Marion St at Nicolas Ave	707	3133	23%	794	3395	23%
Marion St at Dupuy Ave	865	3261	27%	1072	3777	28%
Marion St at Panet St	356	2846	13%	427	2977	14%
Marion St at Dawson Rd	350	2896	12%	419	2875	15%
Dawson Rd at Panet St	6	973	1%	10	992	1%
Marion St at Lagimodière Blvd	357	5450	7%	400	5637	7%
Lagimodière Blvd at Maginot St	203	4611	4%	303	4891	6%
Maginot St at Speers Rd	359	1059	34%	495	1164	43%

4.0 TRANSIT AND ACTIVE MODES

The existing transit service that currently serves the potential development site includes the Marion Street (50) and Archibald Street (19, 57) routes. The current transit network is shown in **Figure 13A**. The suggestion that the site can be designed to generate a high transit mode share is predicated on the establishment of quality service (frequency, reliability, routing) that penetrates or is located within a reasonable walking distance to the development.

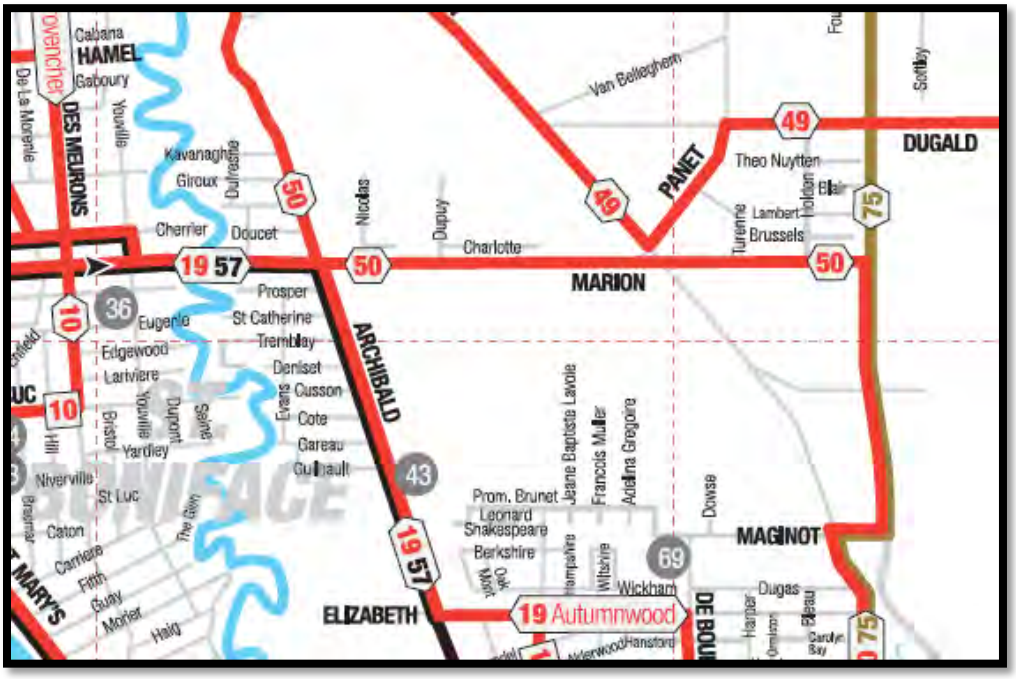


Figure 13A: Current Transit Routes

Establishing bus stops within the development will require further discussion with transit and will be influenced by the recommendations being developed for the upcoming Transit Master Plan project. Potential changes being considered in the Transit Master Plan include creating frequent routes along Marion Street, one continuing along Marion Street to Lagimodiere Blvd. and continuing to Transcona and one providing service along Archibald Street providing service to Southdale Mall. A community service that provides service through the development is also anticipated once the development and links are established. The proposed routing found in the upcoming Transit Master Plan (March 2020 release) is shown in **Figure 13B.**



Figure 13B Proposed Transit Routes from Transit Master Plan (Pending Approval)

The overall transit mode share for adjacent neighborhoods will be influenced by system changes being developed in the Transit Master Plan. Positive increases in transit mode share will result in less vehicular capacity pressure on the roads and intersections in the development study area. The anticipated service level is for an “on Request Service” that would provide service to the industrial areas north of Marion Street. The analysis done in the report assumes a mode share of 10%. The impact to background and generated volumes based on increases in transit modes shares of 15, 20 and 30% are shown in Appendix C. Target transit mode shares range from 20 to 30% for high density transit orientated developments.

A park-and-ride facility has been suggested for this site. A successful implementation of a Park and Ride facility could become a catalyst for increased transit ridership from the site. This has not been investigated in this study because of the unknowns associated with this scenario, but it is anticipated that demand could be in the range of 100 to 200 parking stalls, attracting trips from both north and south of the development. The uptake of a Park and Ride facility would decrease the through traffic at the Marion and Archibald intersection, but increase the Speers and Maginot traffic flow as this would likely be the preferred route ta Park and ride facility in the development.

As previously noted, existing active transportation infrastructure in this area consists of a multi-use path along Archibald St ending 750 m south of the intersection at Marion St. A neighborhood greenway through St. Boniface, which uses the Tremblay Pedestrian and Cycling Bridge to cross the Seine River, provides access to downtown. Additional infrastructure along Archibald St (painted bike lanes), Lagimodière Blvd. (off-street pathway) and Dawson Rd. (painted bike lanes) is recommended in the City of Winnipeg's 2015 Pedestrian and Cycling Strategy Report. This infrastructure would improve the connections from the proposed development to the downtown and other key regional centres, thus promoting the use of active transportation modes. The current and proposed active transportation infrastructure in the area surrounding the proposed development are shown in Figure 14 and Figure 15 below.

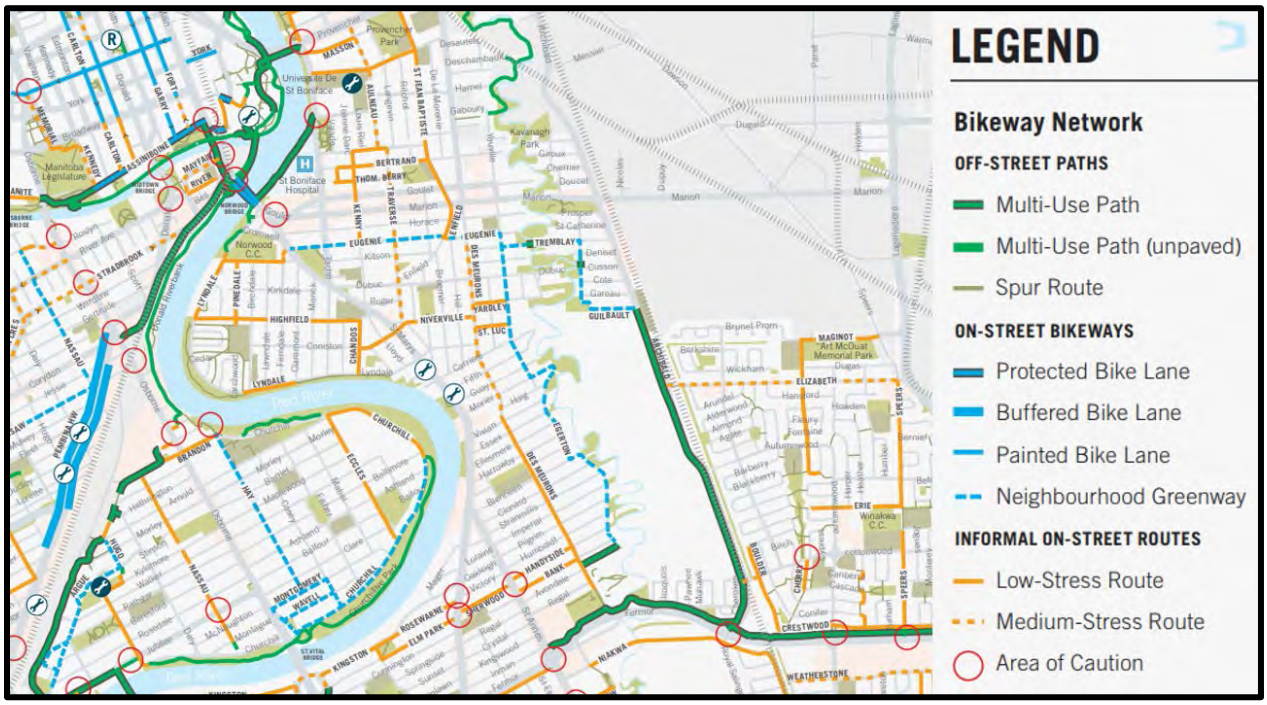


Figure 14: Existing Bike Network (Excerpt from City of Winnipeg Cycling Map)

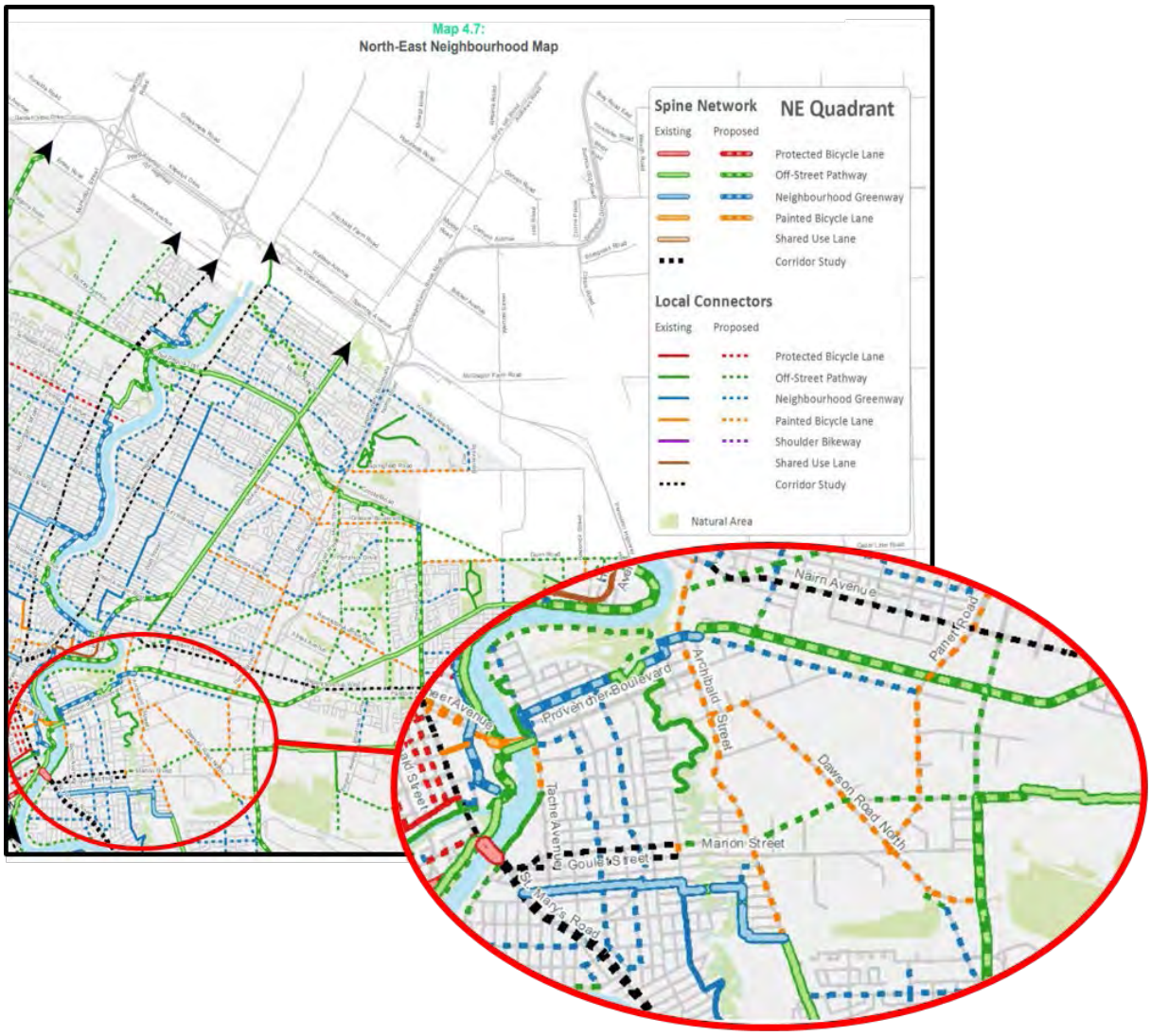


Figure 15: Existing and Proposed Bike Infrastructure (excerpt from Winnipeg Pedestrian and Cycling Strategy)

5.0 TRAFFIC ANALYSIS

Peak hour traffic operations analyses are presented for AM and PM peak hour conditions based on the 10% transit mode share scenario at each of the study intersections. It should be noted that, as per the previous analysis, the 10 % mode share is quite conservative and could be up to 30%. A higher transit mode share would result in better operating performance for all the analyzed intersections.

Analysis was completed using *PTV Vistro Version 7,* a complete traffic analysis and signal optimization software. More information on performance measures is included in Appendix A. Vistro reports from the analyses are included in Appendix D.

The following assumptions were used in the analysis:

- Critical intersection movements were defined as movements with a Level of service (LOS) of D or better.
- Traffic signal timing for the existing conditions (2019) scenarios are based signal timing charts obtained from the City of Winnipeg on June 7, 2019.
- Vistro optimized signal timing conditions are used for the 2025 and 2030 background growth scenarios.
- PHF and heavy vehicle percentages were set as discussed in Section 3.1.1
- Other scenario specific assumptions are noted in the report where necessary.

5.1 MARION STREET AT ARCHIBALD STREET

5.1.1 Existing Conditions and Background Growth Scenarios

The traffic volumes and operating conditions at the intersection of Marion and Archibald for the existing conditions (2019), 2025 background growth and 2030 background growth scenarios for both the AM and PM peak periods are shown in the figures and tables below.

2019 Existing Conditions

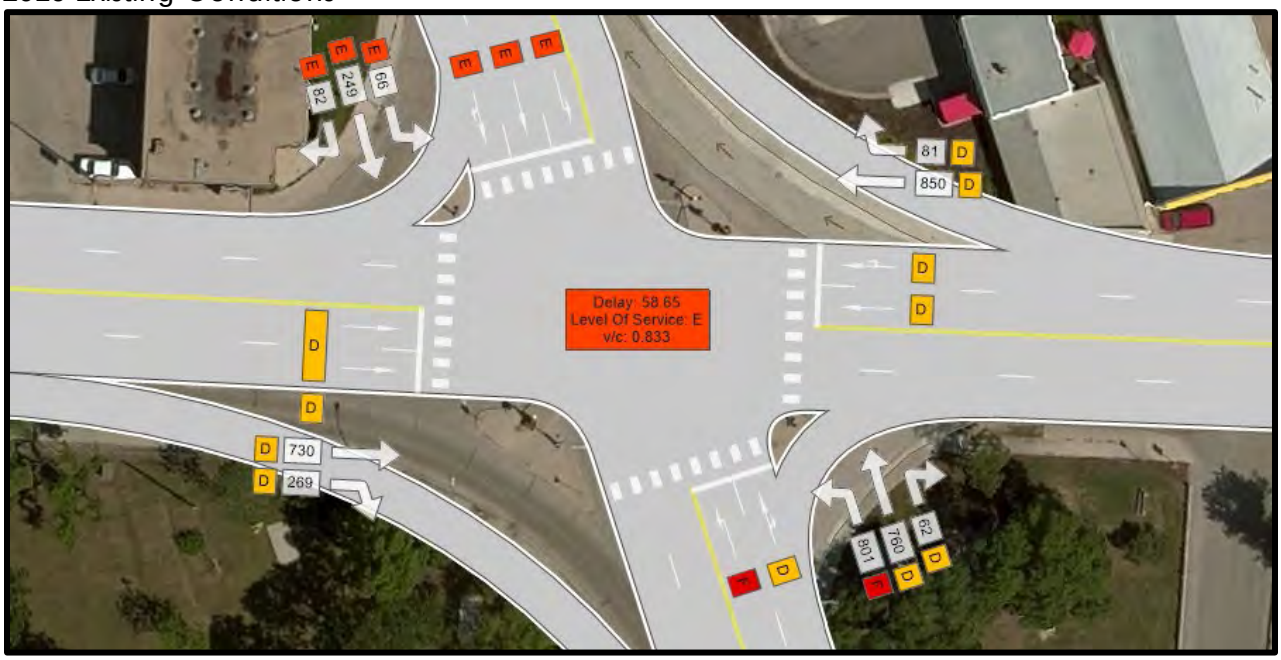


Figure 16: Marion St at Archibald St - 2019 AM Background

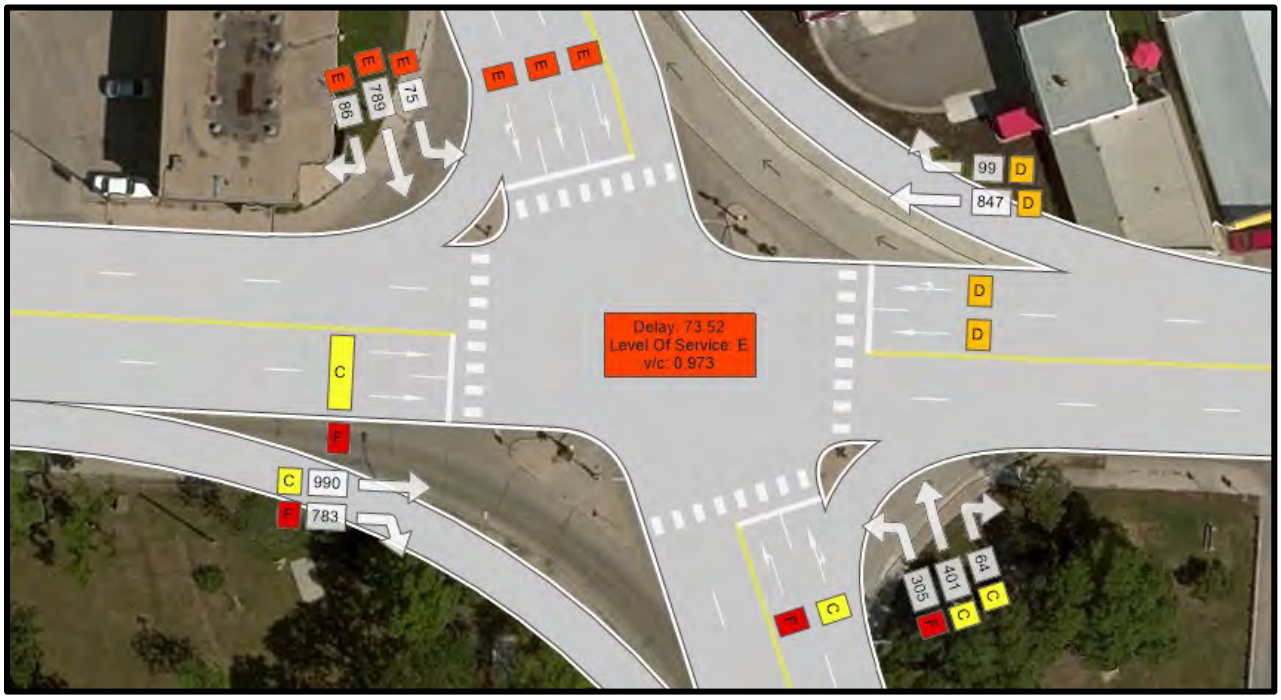


Figure 17: Marion St at Archibald St - 2019 PM Background

Table 15: Existing conditions (2019) Traffic Analysis at Marion St at Archibald St

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	104.18	1.11	F	99.75	1.06
NBT	D	54.09	0.97	C	33.40	0.71
NBR	D	54.09		C	33.40	
SBL	E	70.11	0.78	E	37.60	0.78
SBT	E	66.34	0.81	E	60.66	0.93
SBR	E	68.81		E	60.93	
EBT	D	35.63	0.63	C	34.96	0.76
EBR	D	35.04	0.52	F	196.45	1.33
WBT	D	44.50	0.79	D	35.70	0.69
WBR	D	45.44		D	36.41	
Intersection	**E**	**58.65**	**0.833**	**E**	**73.52**	**0.973**

2025 Background Growth

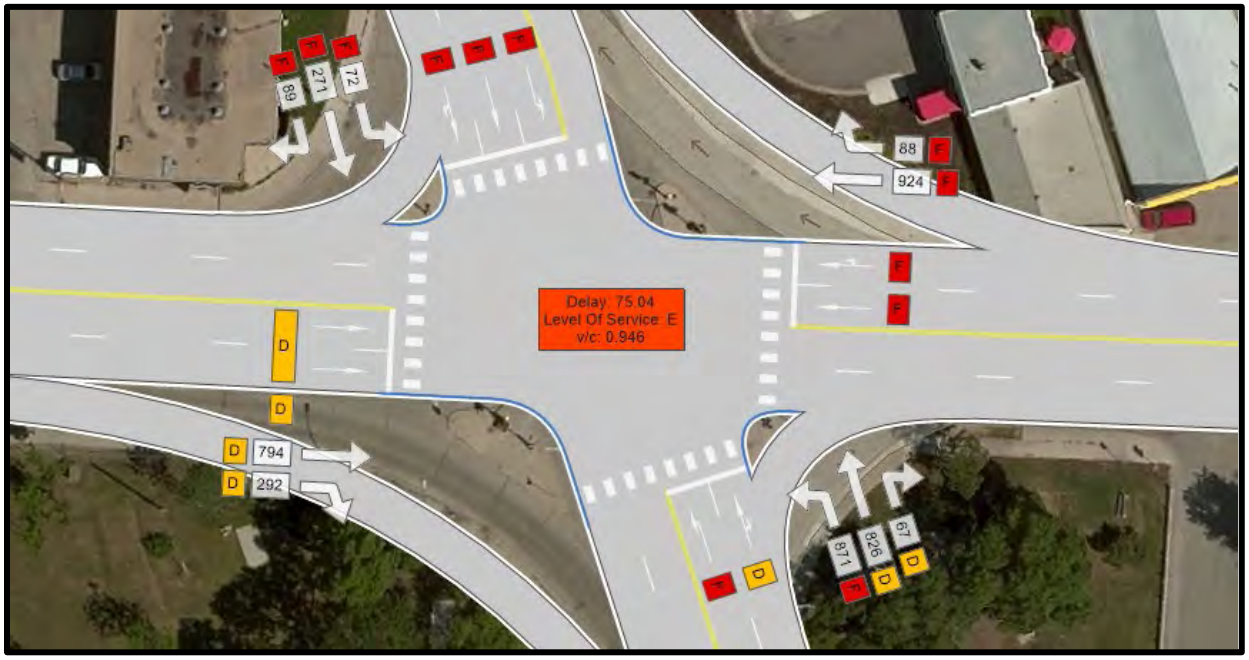


Figure 18: Marion St at Archibald St - 2025 AM Background

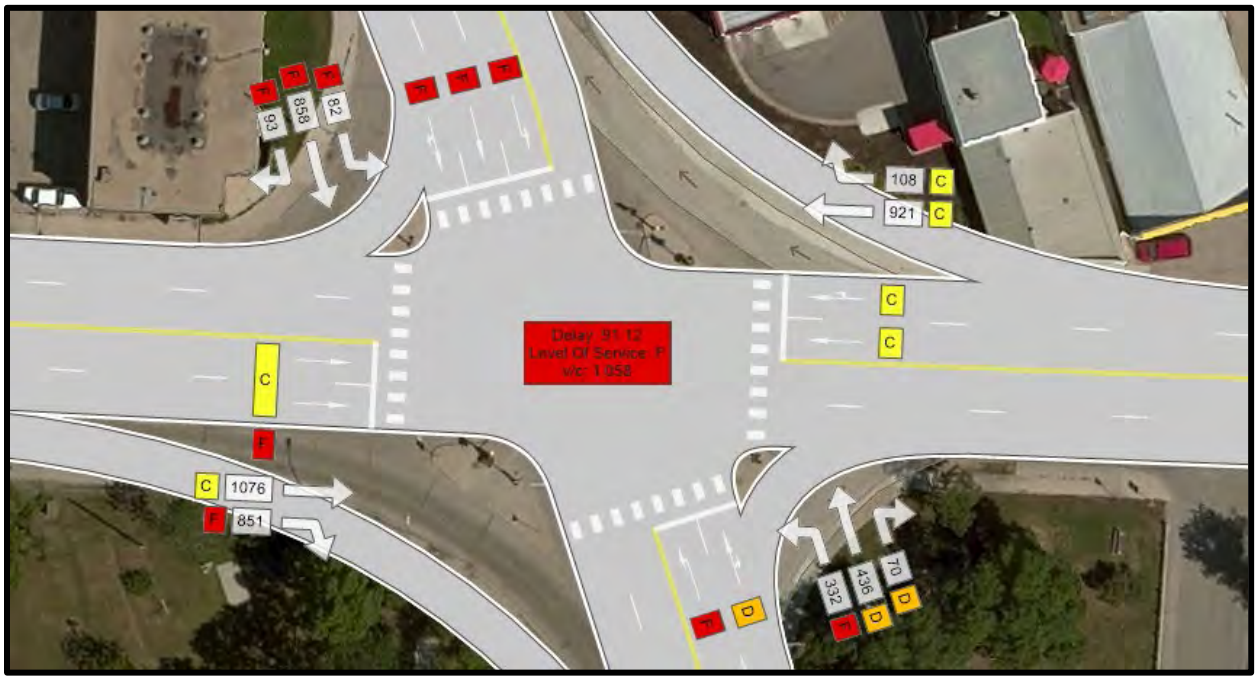


Figure 19: Marion St at Archibald St - 2025 PM Background

Table 16: 2025 Background Growth Traffic Analysis at Marion St at Archibald St

Movement	AM Peak			PM Peak		
	LOS	Delay	V/C	LOS	Delay	v/c
NBL	F	105.53	1.13	F	158.33	1.17
NBT	D	54.59	0.99	D	55.35	0.87
NBR	D	54.59		D	55.35	
SBL	F	87.45	0.8	F	88.32	0.90
SBT	F	89.30	0.96	F	157.23	1.18
SBR	F	94.62		F	157.78	
EBT	D	47.96	0.86	C	32.51	0.71
EBR	D	45.56	0.70	F	158.26	1.24
WBT	F	89.71	1.08	C	32.76	0.64
WBR	F	94.91		C	33.31	
Intersection	**E**	**75.04**	**0.946**	**F**	**91.12**	**1.058**

2030 Background Growth

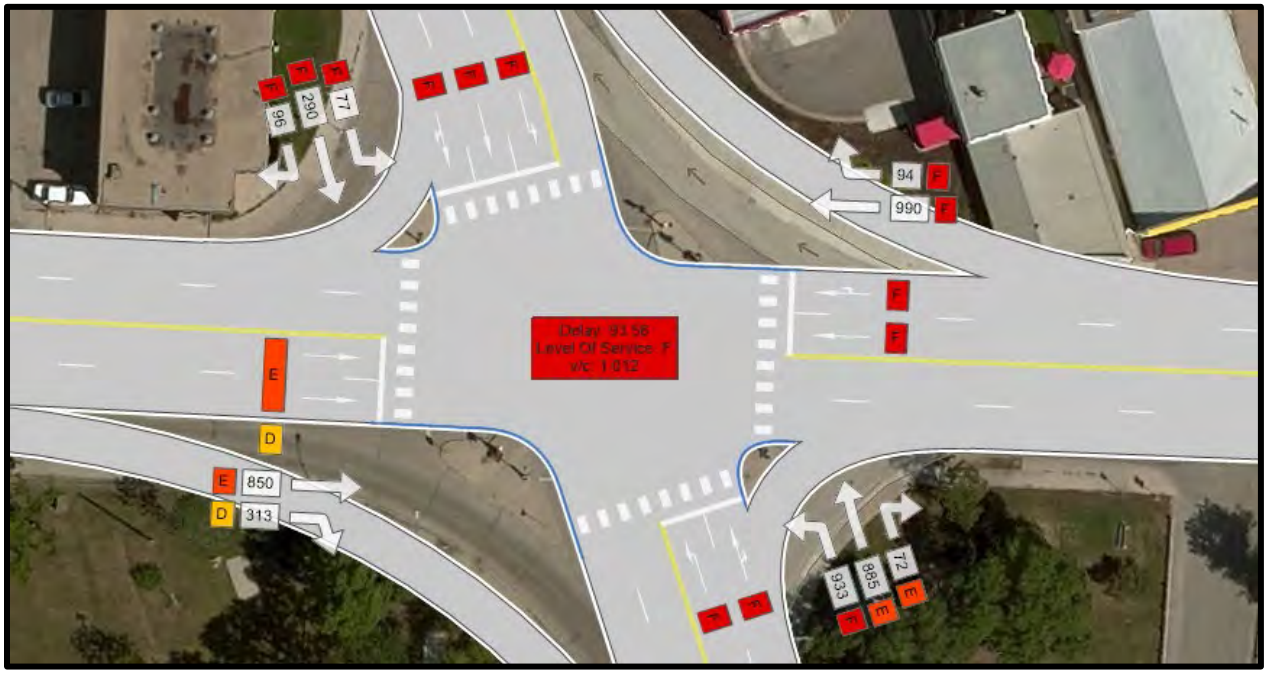


Figure 20: Marion St at Archibald St - 2030 AM Background

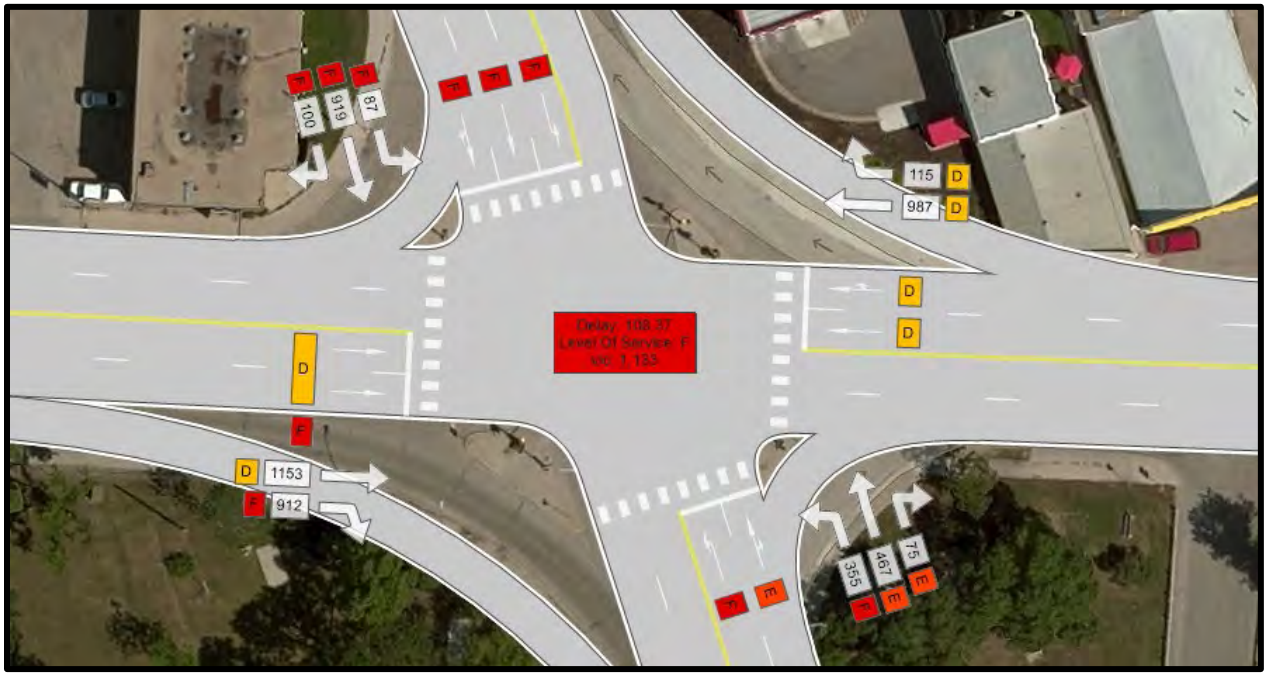


Figure 21: Marion St at Archibald St - 2030 PM Background

Table 17: 2030 Background Growth Traffic Analysis at Marion St at Archibald St

Movement	AM Peak			PM Peak		
	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	129.57	1.18	F	192.89	1.24
NBT	E	68.01	1.03	E	63.89	0.92
NBR	E	68.01		E	63.86	
SBL	F	112.00	1.00	F	94.00	0.91
SBT	F	101.34	1.05	F	185.22	1.25
SBR	F	107.39		F	186.07	
EBT	E	59.12	0.89	D	36.15	0.75
EBR	D	54.23	0.73	F	195.64	1.33
WBT	F	118.40	1.08	D	36.32	0.71
WBR	F	125.04		D	37.02	
Intersection	**F**	**93.58**	**1.012**	**F**	**108.37**	**1.133**

The analysis shows that the intersection is currently operating at capacity in both the AM and PM peak periods. Thru movements on Marion operate with reasonable delays however the north-south cross street traffic (Archibald St) has both turning and thru movements experiencing excessive delays. With the anticipated background growth, delays for thru traffic along Marion are increased to unacceptable levels in the AM by 2025, while delays for Archibald deteriorate further. The overall result is an expected LOS F at the intersection level in both the AM and PM peak periods by 2030.

5.1.2 Mitigation Scenarios for Background Growth

The development of standard mitigation treatments (typical lane additions) for both 2025 and 2030 background growth scenarios have been analyzed. These treatments are presented as one possible solution to address the current infrastructure requirements based on the current mode share and growth rates.

Our understanding is the City of Winnipeg is aware of the operational concerns along the Archibald, Marion and Lagimodière corridors and are in the process of developing appropriate infrastructure improvements, including investigating transit improvements to increase mode share. The infrastructure improvements suggested for intersections external to the development (Marion & Archibald, Marion & Lagimodière, Lagimodière & Maginot) are to be considered one potential option and there is no suggestion that the developer be responsible to implement or contribute directly to the implementation of these improvements.

The 2030 mitigation treatments are based on the assumption that all 2025 mitigation measures are implemented (i.e. they are incremental measures). A general assumption has been made that improvements to a single approach would be made at one time, therefore mitigation measures have been examined approach by approach when considering what improvements are required by 2025 and which are required by 2030.



2025 Mitigation Scenario

Treatments that result in in an acceptable level of service for the 2025 background growth scenario (Mitigation 1) are identified below:

- Add a second EB right-turn lane, having a storage length of 100 m
- Introduce overlap control for EB right-turn corresponding to northbound left turn movement
- Add two exclusive NB left-turn lanes while converting the existing left-turn lane to a through lane (resulting in a total of two NB left-turn lanes, one through lane, and one shared through/right-turn lane)
- Increase NB left-turn lane storage to 150 m

2030 Mitigation Scenario

Additional treatments required to provide an acceptable level of service for the 2030 background growth scenario (Mitigation 2) are identified below:

- Add an exclusive SB right-turn lane with 100 m of storage
- Increase storage for existing SB left-turn lane to 100 m

Figure 22 shows the proposed intersection configuration for Marion St and Archibald St comprising all mitigation measures (mitigation 1 and 2).

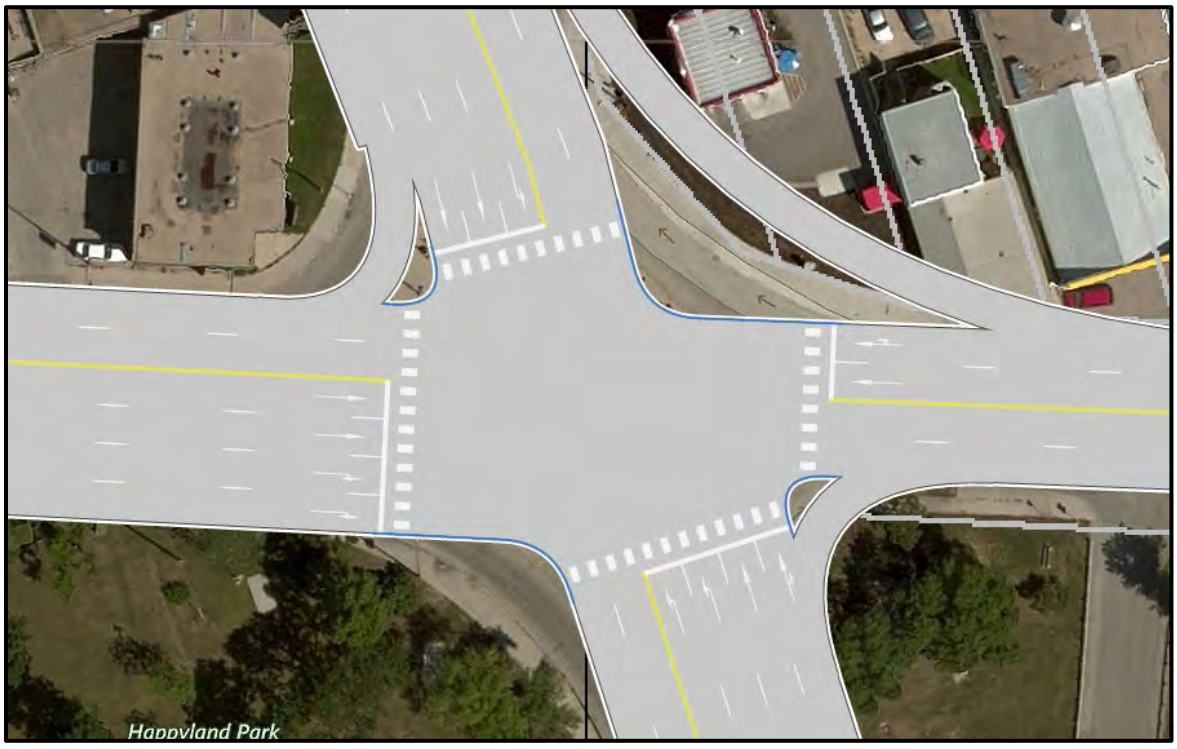


Figure 22: Marion St and Archibald St – Intersection Configuration with Mitigation Measures

Table 18 summarizes the operating conditions at the intersection with the proposed mitigation measures in place.

Table 18: Analysis of Mitigation Measures at Marion St and Archibald St

	AM Peak						PM Peak					
	2025 Background with Mitigation 1			2030 Background with Mitigation 1 & 2			2025 Background with Mitigation 1			2030 Background with Mitigation 1 & 2		
Movement	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
NBL	C	31.37	0.92	C	31.38	0.94	C	20.31	0.37	D	40.61	0.89
NBT	C	22.29	0.70	C	24.27	0.77	A	9.09	0.28	C	21.38	0.48
NBR	C	22.74		C	25.00		A	9.10		C	21.40	
SBL	D	47.37	0.75	D	47.34	0.77	D	40.46	0.74	D	45.26	0.48
SBT	D	37.57	0.78	D	36.08	0.73	C	28.36	0.87	D	35.66	0.76
SBR	D	38.54		D	35.28	0.54	C	28.50		C	22.07	0.97
EBT	C	24.42	0.68	C	25.21	0.72	C	20.90	0.84	D	44.06	0.97
EBR	A	3.60	0.16	A	3.14	0.16	B	13.10	0.64	B	12.17	0.62
WBT	C	33.88	0.94	D	37.72	0.89	C	22.31	0.80	D	41.51	0.92
WBR	D	36.15		D	41.03		C	23.02		D	44.09	
Intersection	**C**	**28.04**	**0.690**	**C**	**29.45**	**0.708**	**C**	**20.37**	**0.711**	**C**	**33.44**	**0.741**

The mitigation treatments proposed for 2025 result in the average delay at the intersection improving from approximately 75 seconds to 28 seconds in the AM Peak and 91 seconds to 20 seconds in the PM. The

additional improvements in 2030 result in the average delay being maintained at an acceptable level, 29 seconds in the AM Peak and 33 seconds in the PM.

5.1.3 Post-Development Scenarios

The traffic volumes and operating conditions at the intersection of Marion and Archibald for 2025 partial build out and 2030 full build out scenarios with the proposed mitigation measures to address 2025 and 2030 background growth are shown in the figures and tables below.

2025 Background + Partial Build Out

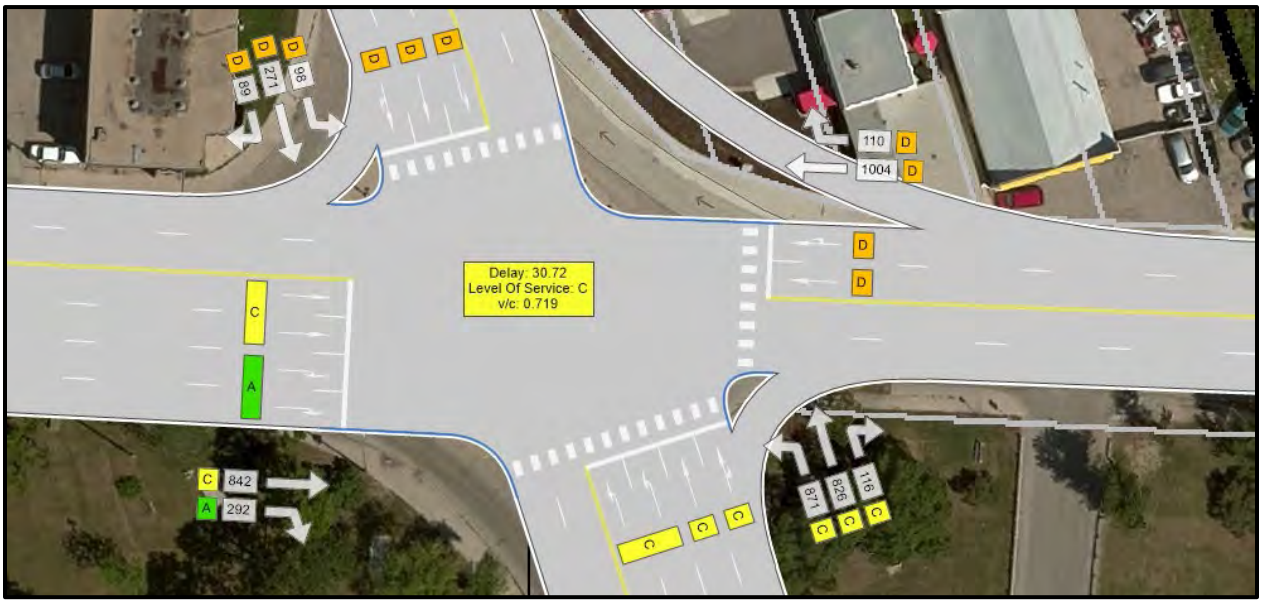


Figure 23: Marion St at Archibald St – 2025 AM – Partial Build-Out with Mitigation Measures

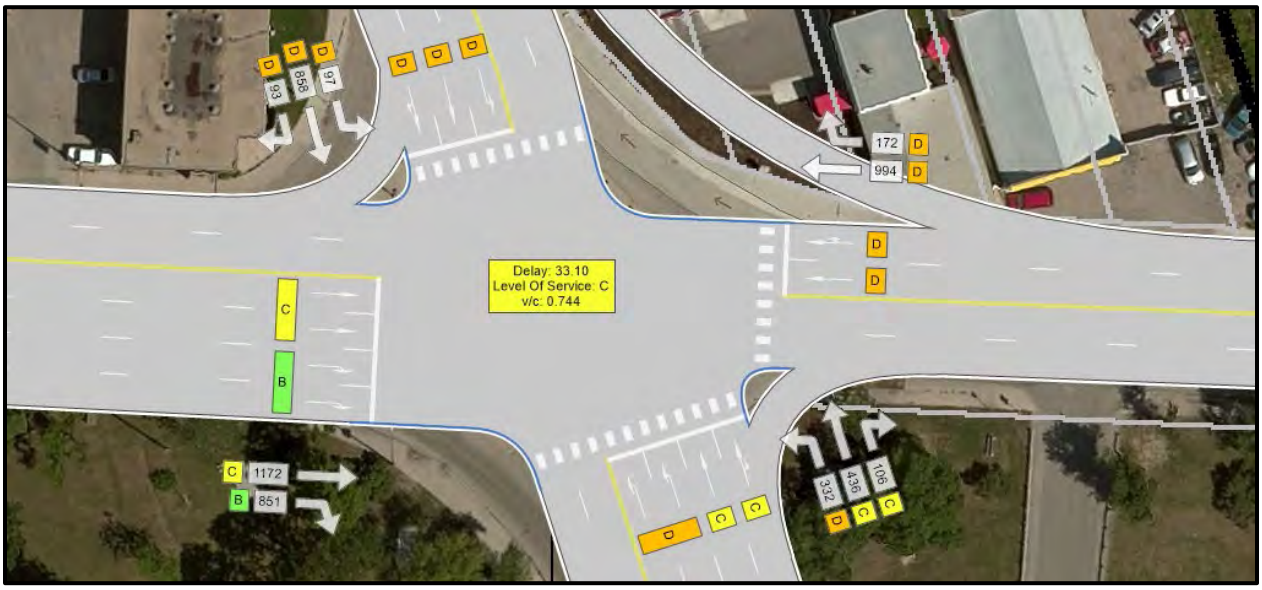


Figure 24: Marion St at Archibald St – 2025 PM – Partial Build-Out with Mitigation Measures

Table 19: 2025 Partial Build Out with Mitigation Measures Traffic Analysis at Marion St and Archibald St

Movement	AM Peak			PM Peak		
	LOS	Delay	v/c	LOS	Delay	v/c
NBL	C	34.05	0.95	D	45.03	0.93
NBT	C	26.67	0.84	C	21.74	0.49
NBR	C	28.42		C	21.77	
SBL	D	43.65	0.60	D	44.69	0.76
SBT	D	37.92	0.68	D	43.19	0.94
SBR	D	33.85		D	43.50	
EBT	C	24.20	0.73	C	34.96	0.92
EBR	A	3.52	0.16	B	11.68	0.58
WBT	D	37.32	0.96	D	38.99	0.92
WBR	D	41.18		D	42.61	
Intersection	**C**	**30.72**	**0.719**	**C**	**33.10**	**0.744**

2030 Background + Full Build Out

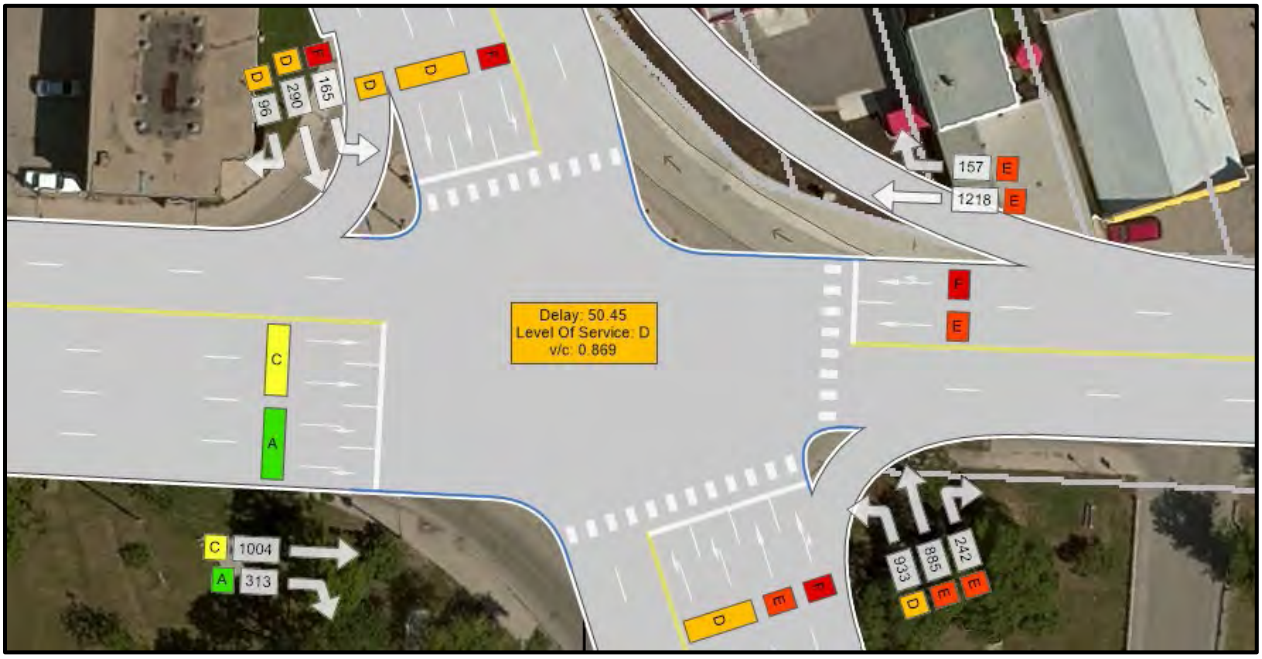


Figure 25: Marion St at Archibald St – 2030 AM – Full Build-Out with Mitigation Measures

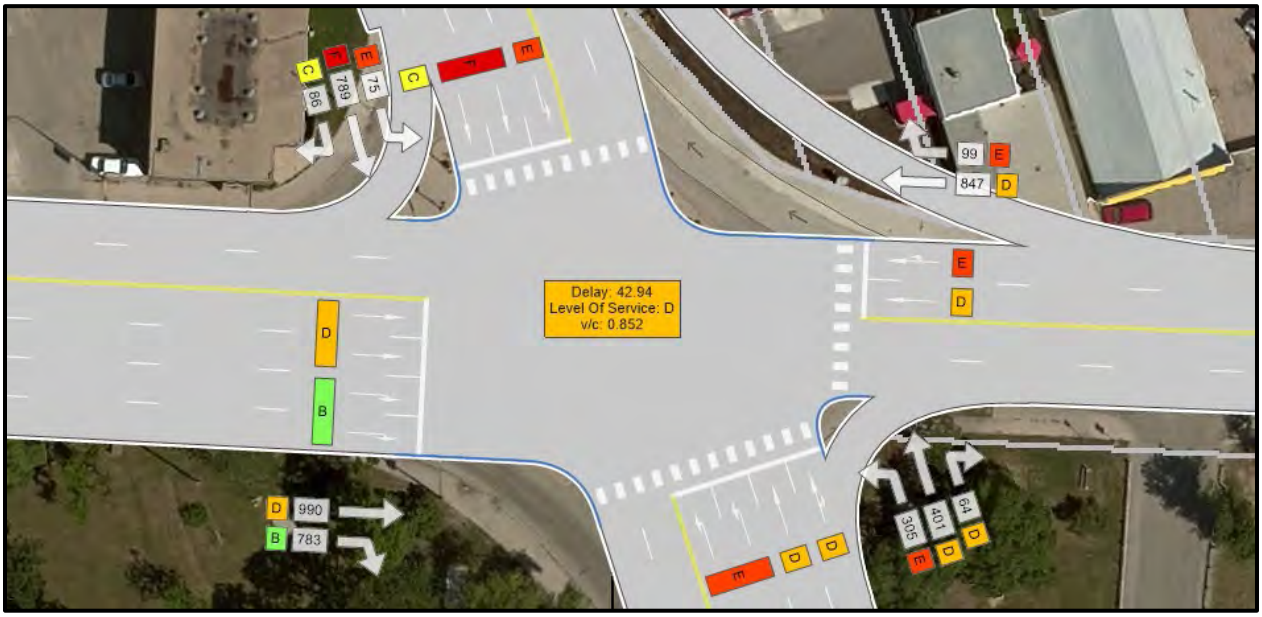


Figure 26: Marion St at Archibald St – 2030 PM – Full Build-Out with Mitigation Measures

Table 20: 2030 Full Build Out with Mitigation Measures at Marion St and Archibald St

Movement	AM Peak			PM Peak		
	LOS	Delay	v/c	LOS	Delay	v/c
NBL	D	39.27	0.95	E	59.31	0.94
NBT	E	64.71	1.04	D	36.36	0.66
NBR	E	78.35		D	36.55	
SBL	F	77.59	1.01	E	58.37	0.82
SBT	D	43.12	0.67	F	61.56	1.03
SBR	D	42.24	0.50	C	31.53	0.25
EBT	C	29.94	0.77	D	39.53	0.94
EBR	A	3.34	0.16	B	12.22	0.56
WBT	E	67.77	1.04	D	50.27	0.99
WBR	E	74.30		E	58.78	
Intersection	**D**	**50.45**	**0.869**	**D**	**42.94**	**0.852**

The analysis of the partial and full build out scenarios show that with the proposed mitigation measures in place, the intersection is still expected to operate at a level of service that is improved from what is currently experienced.

For the 2025 partial build out scenario, when development traffic is added to the improved intersection, the average intersection delay increases to 31 seconds in the AM Peak (from 28 seconds for background growth only) and to 33 seconds in the PM Peak (from 20 seconds for background growth only). For the 2030 scenario the development traffic is more significant and increases the average intersection delay to 54 seconds in the AM Peak and 42 seconds in the PM Peak, as compared to 39 seconds and 33 seconds in the AM and PM Peak 2030 background growth scenarios respectively. (The current conditions have an AM intersection delay of 59 seconds and a PM delay of 74 seconds.) It should be noted that for the 2030 full build out scenario, even with the mitigation measures in place, several movements are still critical. In particular delay becomes significant for the NB/SB movements once again. However, the priority street at this intersection is Marion, therefore this delay is considered acceptable. Thus, no further mitigation measures are recommended at this intersection to accommodate development traffic. It does show that improvements to Transit service are critical to help reduce the reliance on vehicle trips.

5.1.4 Marion St and Archibald St Summary

A summary of the intersection level results for each of the analysis scenarios is presented in Table 21 on the following page.

Table 21: Marion St and Archibald St - Summary of Analysis Scenarios

	AM Peak			PM Peak		
Scenario	LOS	Delay	v/c	LOS	Delay	v/c
2019 BG (Existing)	E	58.65	0.833	E	73.52	0.973
2025 BG	E	75.04	0.946	F	91.12	1.058
2025 BG – Mitigated	C	28.04	0.690	C	20.37	0.711
2025 Partial Build Out - Unmitigated	F	89.21	0.977	F	87.18	1.061
2025 Partial Build Out - Mitigated	C	30.72	0.719	C	33.10	0.744
2030 BG	F	93.58	1.012	F	108.37	1.133
2030 BG – Mitigated	C	29.45	0.708	C	33.44	0.741
2030 Full Build Out - Unmitigated	F	154.29	1.196	F	113.47	1.142
2030 Full Build Out - Mitigated	D	50.45	0.869	D	42.94	0.852

The table above shows that given the poor level of service currently provided at this intersection, if the recommended mitigation measures were put in place, the level of service could be improved from existing conditions even with full development traffic.

5.2 INTERSECTIONS OF MARION STREET, DAWSON ROAD AND PANET ROAD

5.2.1 Existing Conditions and Background Growth Scenarios

The traffic volumes and operating conditions at the intersection of Marion St & Panet St, and Marion St & Dawson Rd and Dawson Rd & Panet for the existing conditions (2019), 2025 background growth and 2030 background growth scenarios for both the AM and PM peak periods are shown in the figures below. Detailed operating conditions by movement have only been provided for the intersection of Marion St and Dawson Rd as this intersection accommodates the highest traffic volumes and is expected to be the most impacted by the new development.

Existing Conditions (2019)

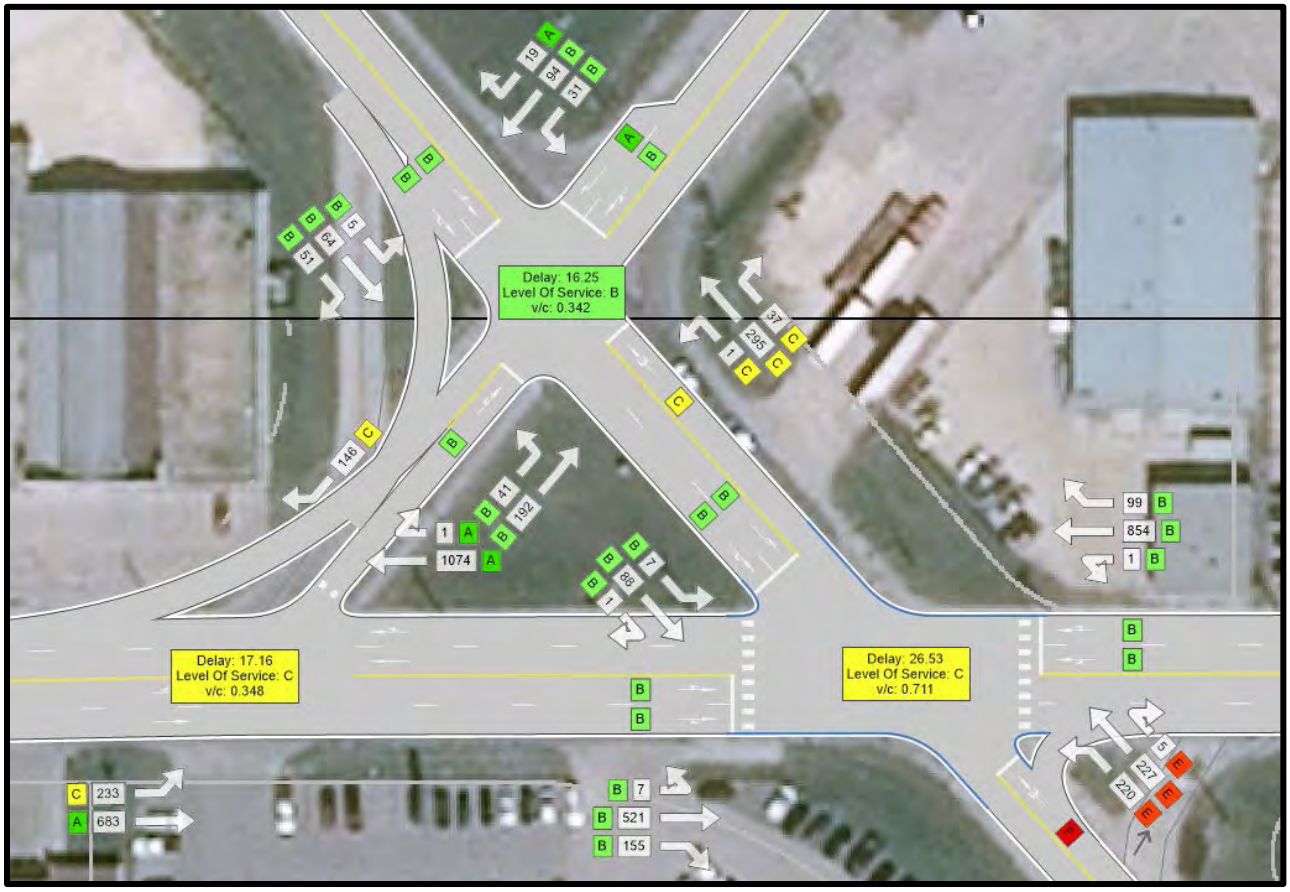


Figure 27: Marion St / Panet St / Dawson Rd – 2019 AM Background

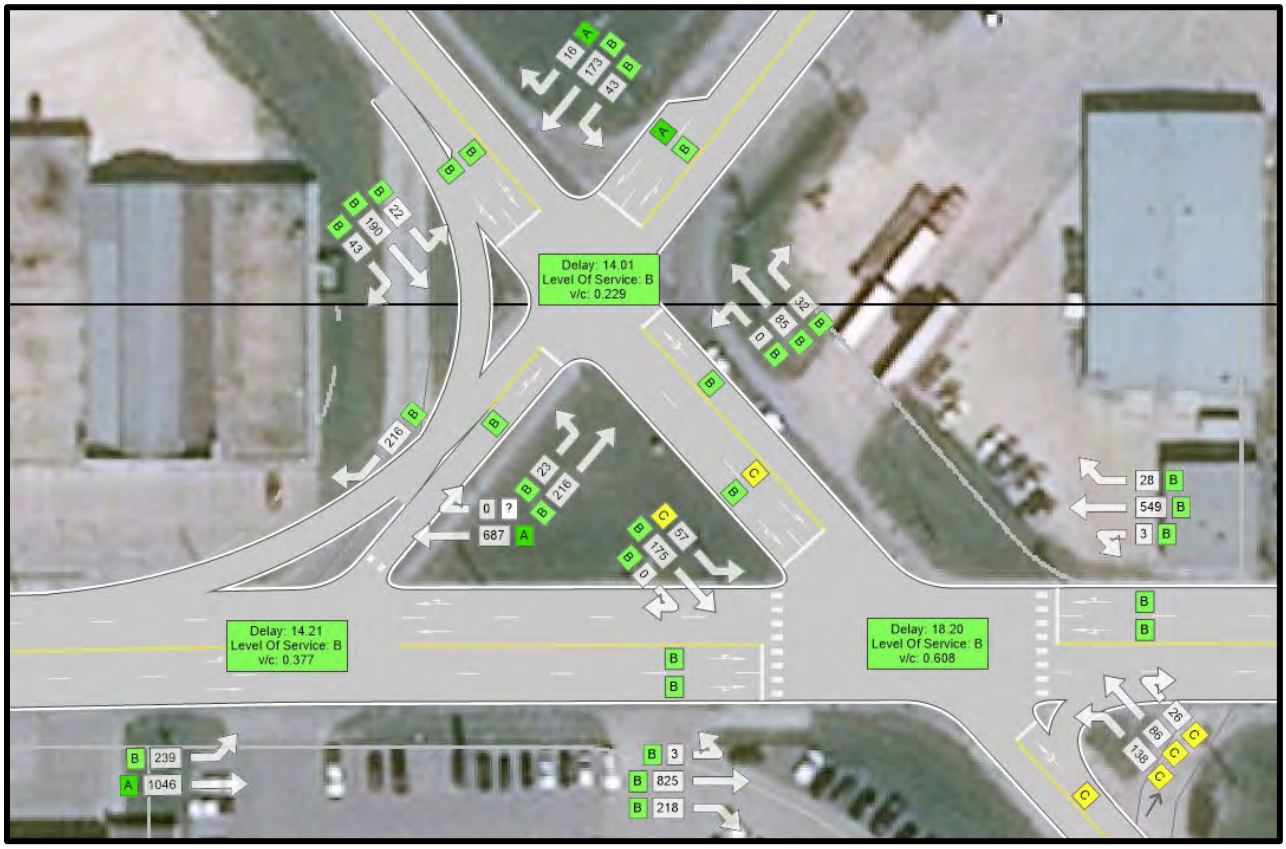


Figure 28: Marion St / Panet St / Dawson Rd – 2019 PM Background

Table 22: 2019 Existing Conditions Traffic Analysis at Marion St and Dawson Rd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
EBL	B	13.39		B	17.27	
EBT	B	13.59	14.04	B	17.78	0.69
EBR	B	14.04		B	18.89	
WBL	B	15.88		B	12.33	
WBT	B	16.29	0.62	B	12.47	0.37
WBR	B	16.89		B	12.64	
NWBL	E	69.52		C	30.73	
NWBT	E	69.52	1.01	C	30.73	0.65
NWBR	E	69.52		C	30.73	
SEBL	B	16.83	0.08	C	25.11	0.42
SEBT	B	16.80	0.18	B	18.20	0.31
SEBR	B	168.80		B	18.20	
Intersection	**C**	**26.53**	**0.711**	**B**	**18.20**	**0.608**

2025 Background Growth

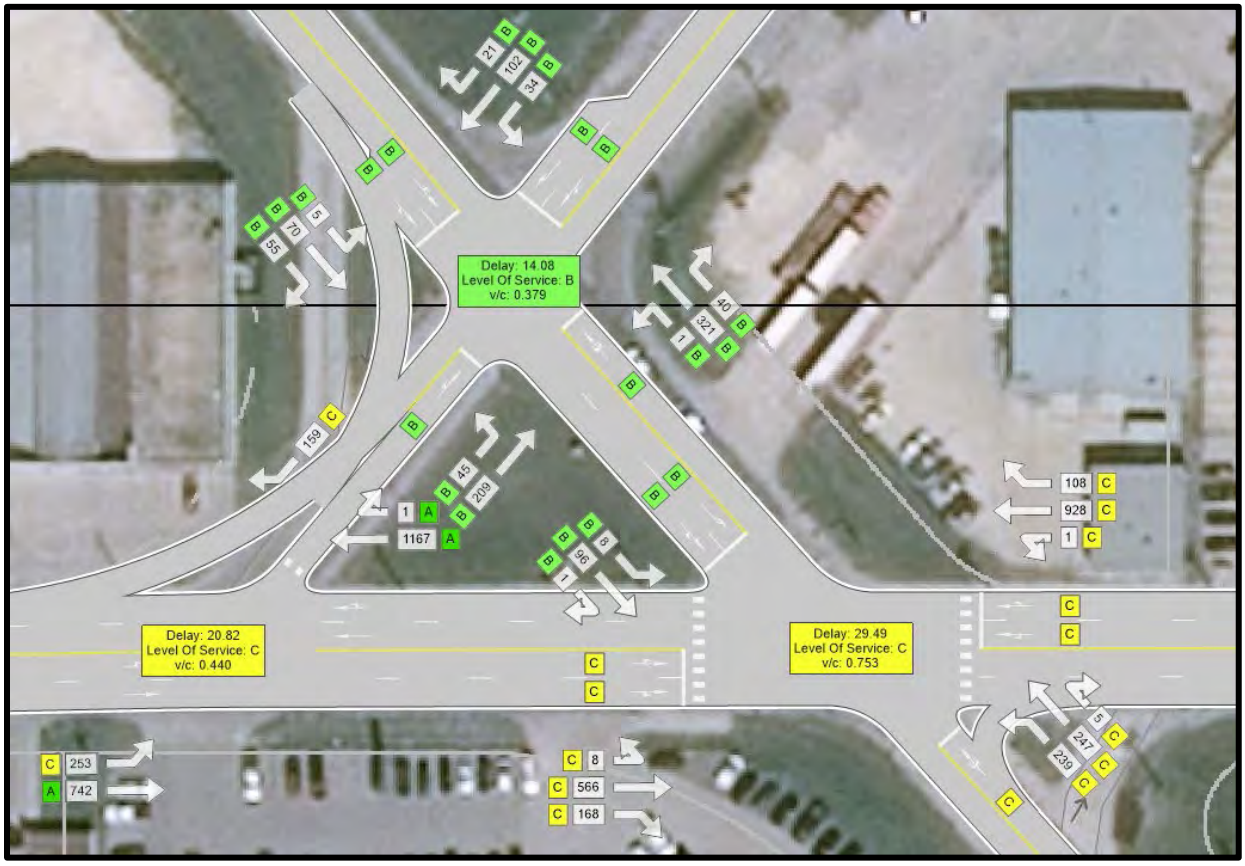


Figure 29: Marion St / Panet St / Dawson Rd – 2025 AM Background

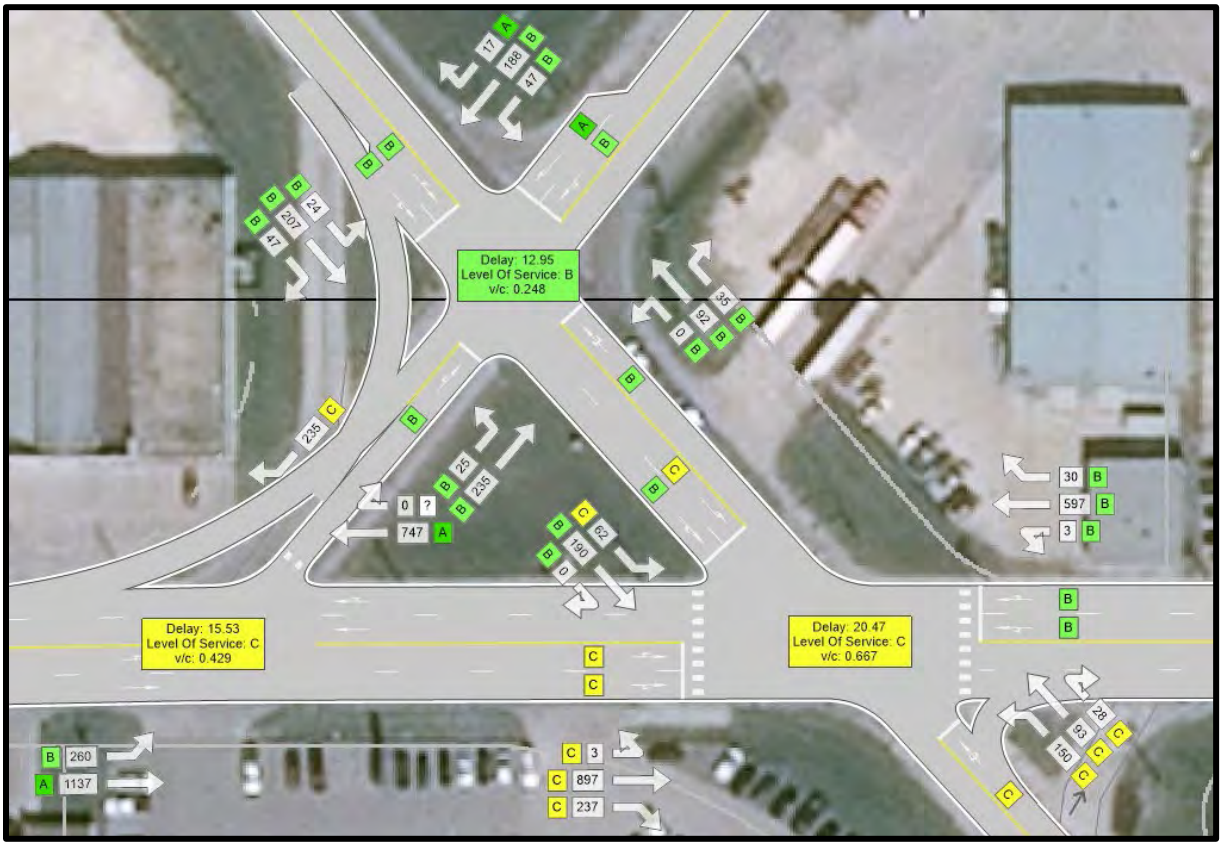


Figure 30: Marion St / Panet St / Dawson Rd – 2025 PM Background

Table 23: 2025 Background Growth Traffic Analysis at Marion St and Dawson Rd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
EBL	C	23.67		C	20.18	
EBT	C	24.57	0.69	C	21.06	0.77
EBR	C	26.08		C	22.96	
WBL	C	29.95		B	13.44	
WBT	C	31.84	0.84	B	13.62	0.42
WBR	C	34.59		B	13.84	
NWBL	C	34.38		C	32.16	
NWBT	C	34.38	0.83	C	32.16	0.69
NWBR	C	34.38		C	32.16	
SEBL	B	13.67	0.08	C	29.46	0.51
SEBT	B	13.38	0.15	B	17.68	0.32
SEBR	B	13.38		B	17.68	
Intersection	**C**	**29.49**	**0.753**	**C**	**20.47**	**0.667**

2030 Background Growth

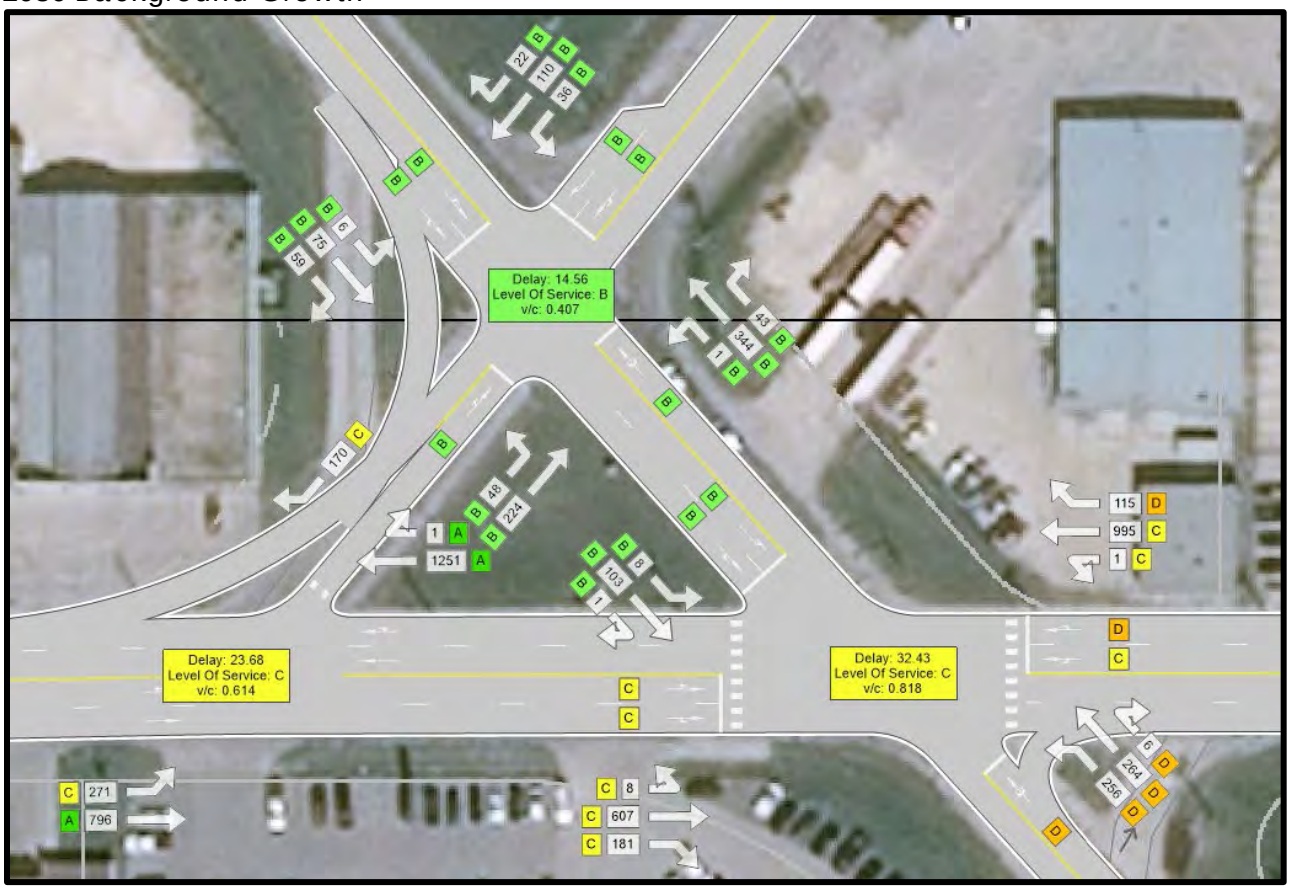


Figure 31: Marion St / Panet St / Dawson Rd – 2030 AM Background

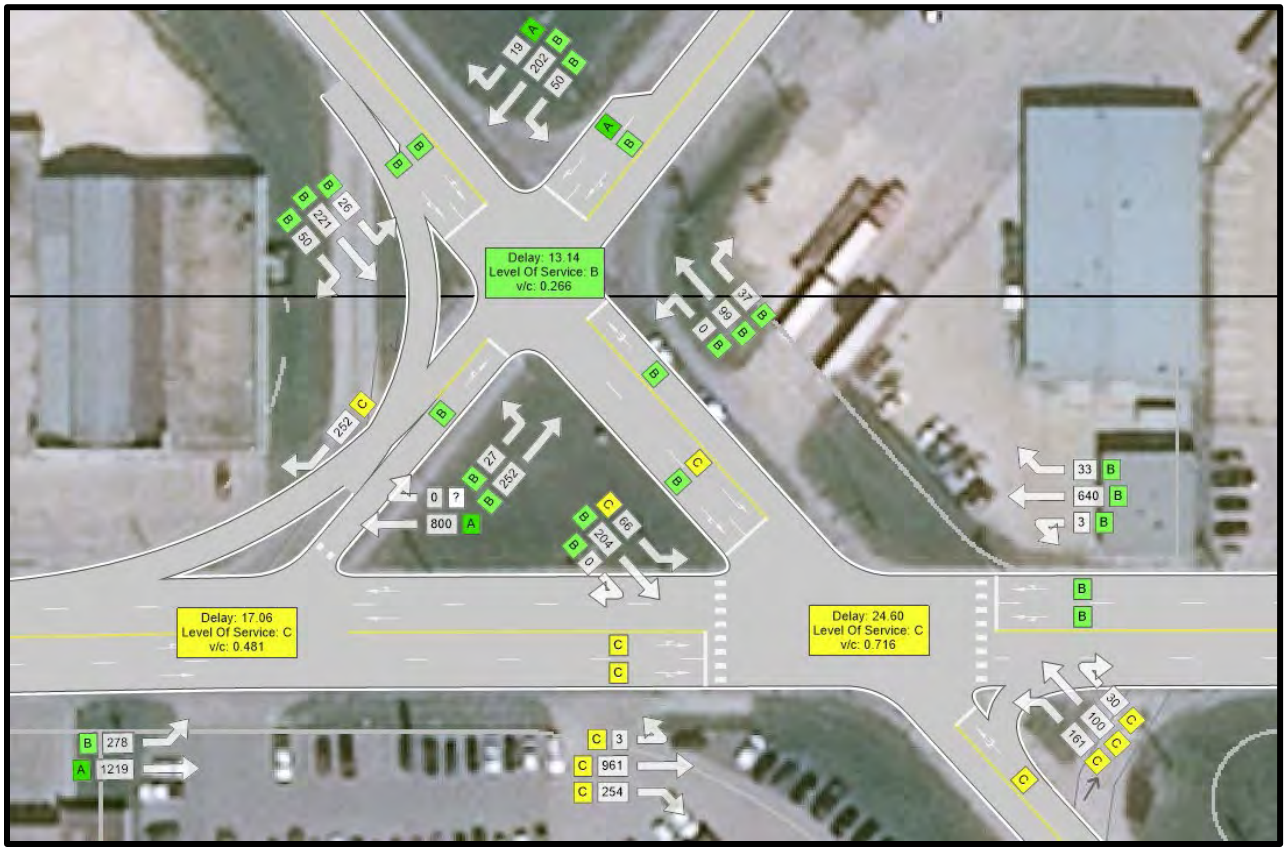


Figure 32: Marion St / Panet St / Dawson Rd – 2030 PM Background

Table 24: 2030 Background Growth Traffic Analysis at Marion St and Dawson Rd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
EBL	C	22.38		C	26.19	
EBT	C	24.24	0.79	C	28.27	0.88
EBR	C	26.94		C	32.71	
WBL	C	28.33		B	15.58	
WBT	C	32.23	0.91	B	15.92	0.49
WBR	D	37.91		B	16.30	
NWBL	D	47.60		C	30.74	
NWBT	D	47.60	0.95	C	30.74	0.70
NWBR	D	47.60		C	30.74	
SEBL	B	11.61	0.07	C	27.19	0.51
SEBT	B	11.54	0.17	B	16.29	0.32
SEBR	B	11.54		B	16.29	
Intersection	**C**	**32.43**	**0.818**	**C**	**24.60**	**0.716**

The analysis shows that all three intersections are operating without significant concern in the current and future background growth scenarios. Only the northwest bound approach at the intersection of Marion St and Dawson Rd is experiencing notable delay however this delay is addressed in the future scenarios by optimizing signal conditions. As the intersections continue to operate at acceptable levels in future scenarios, no mitigation measures are anticipated to address future background growth.

5.2.2 Post-Development Scenarios

2025 Background + Partial Build Out

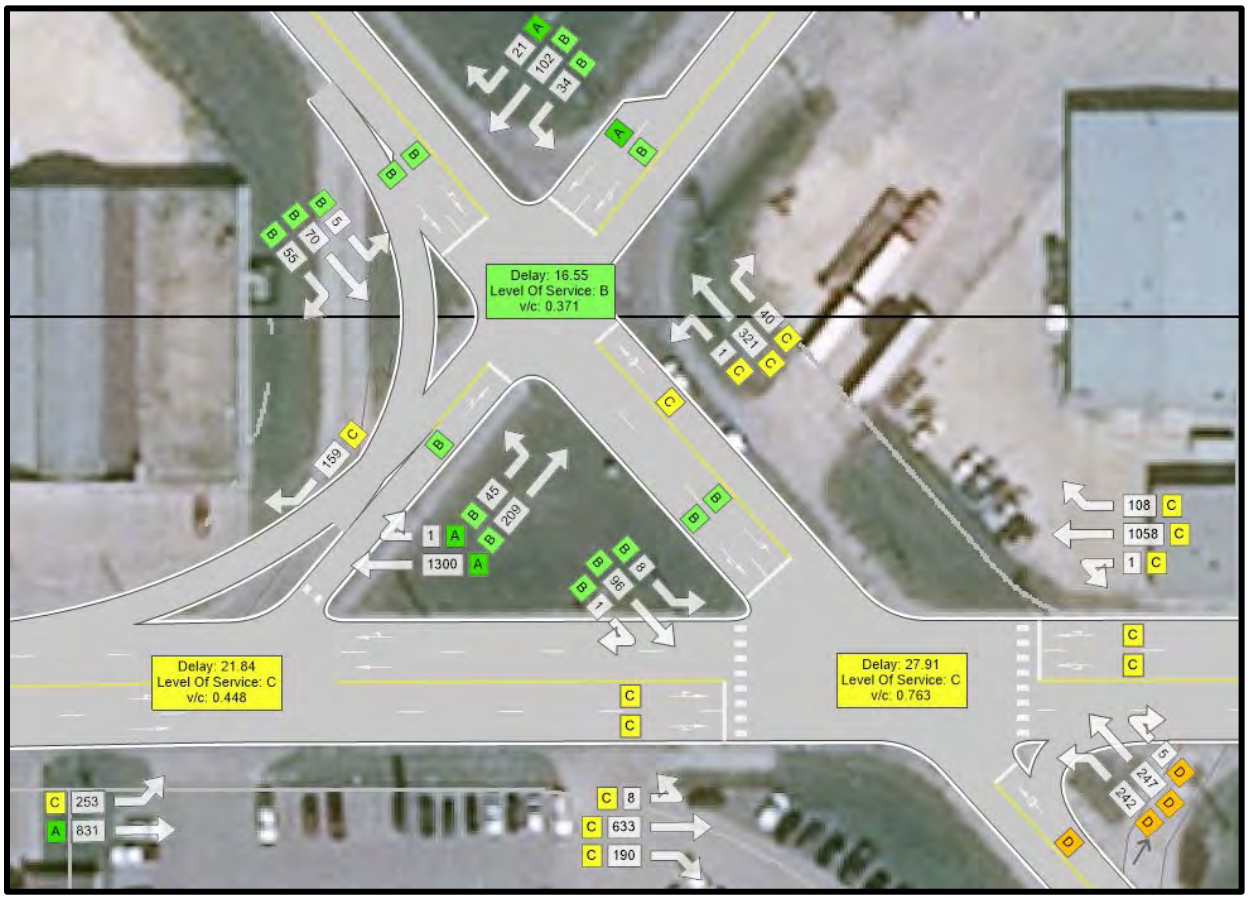


Figure 33: Marion St / Panet St / Dawson Rd – 2025 AM Partial Build Out



Figure 34: Marion St / Panet St / Dawson Rd – 2025 PM Partial Build Out

Table 25: 2025 Partial Build Out Traffic Analysis at Marion St and Dawson Rd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
EBL	C	20.88		B	18.60	
EBT	C	21.80	0.71	B	19.73	0.81
EBR	C	23.36		C	22.14	
WBL	C	27.49		B	11.21	
WBT	C	29.88	0.87	B	11.37	0.43
WBR	C	33.24		B	11.55	
NWBL	D	35.40		D	42.14	
NWBT	D	35.40	0.85	D	42.14	0.79
NWBR	D	35.40		D	42.14	
SEBL	B	13.88	0.09	D	46.72	0.65
SEBT	B	13.09	0.13	C	21.15	0.37
SEBR	B	13.09		C	21.15	
Intersection	**C**	**27.91**	**0.763**	**C**	**20.72**	**0.730**

2030 Background + Full Build Out

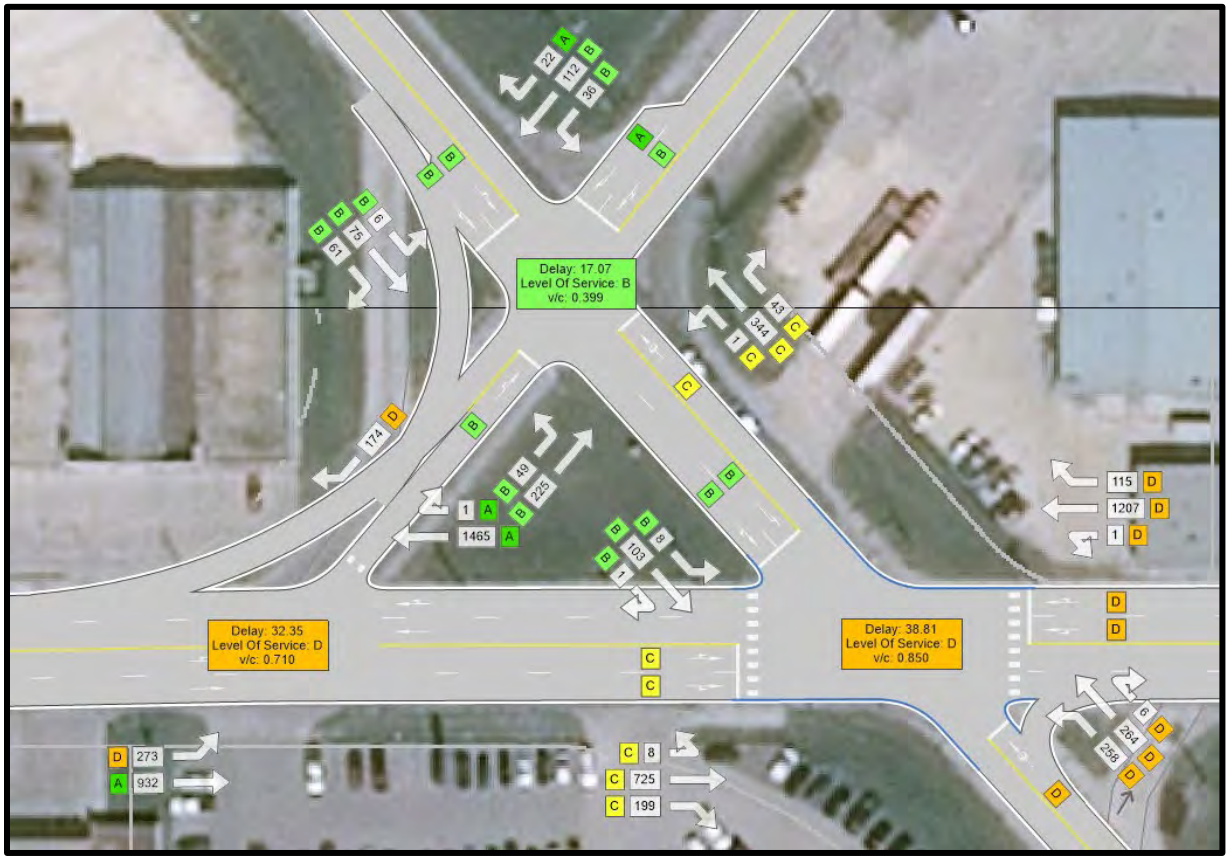


Figure 35: Marion St / Panet St / Dawson Rd – 2030 AM Full Build Out

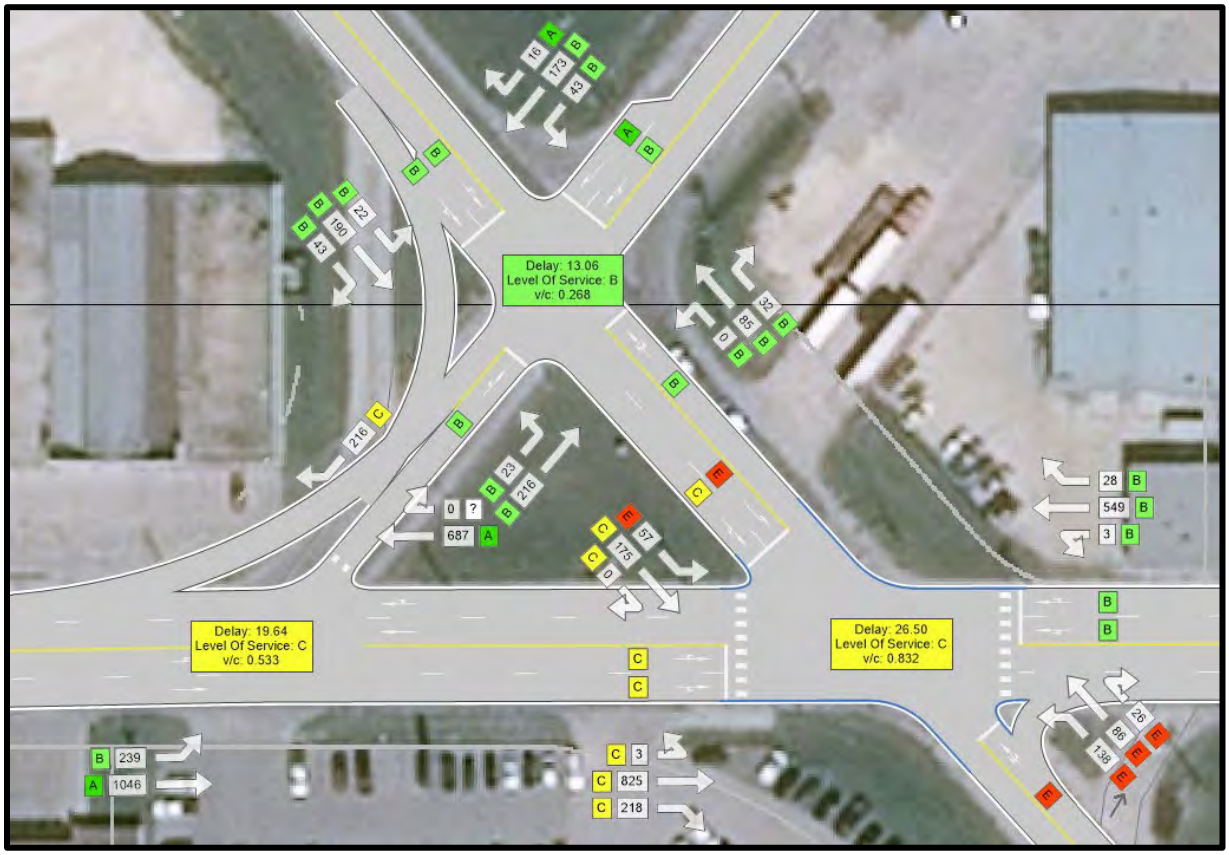


Figure 36: Marion St / Panet St / Dawson Rd – 2030 PM Partial Build Out

Table 26: 2030 Full Build Out Traffic Analysis at Marion St and Dawson Rd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
EBL	C	27.09		C	22.00	
EBT	C	29.10	0.85	C	23.84	0.88
EBR	C	31.67		C	27.69	
WBL	D	37.57		B	12.00	
WBT	D	43.88	0.99	B	12.15	0.45
WBR	D	52.60		B	12.34	
NWBL	D	45.84		E	66.12	
NWBT	D	45.84	0.93	E	66.12	0.93
NWBR	D	45.84		E	66.12	
SEBL	B	13.89	0.09	E	72.91	0.80
SEBT	B	13.18	0.15	C	24.33	0.40
SEBR	B	13.18		C	24.33	
Intersection	**D**	**38.81**	**0.850**	**C**	**26.50**	**0.832**

The analysis of the partial and full development scenarios shows that even with the future development traffic, the intersections of Marion St & Panet Road, Marion St & Dawson Rd, and Panet Rd & Dawson Rd

continue to operate without significant concern. Though there were several critical movements identified in the 2030 PM Peak Full Build Out scenario, the overall intersection is expected to operate with only moderate delay. Therefore, no mitigation measures are recommended for these intersections to accommodate the new traffic generated from the proposed development.

5.3 MARION STREET AT LAGIMODIÈRE BOULEVARD

5.3.1 Existing Conditions and Background Growth Scenarios

The traffic volumes and operating conditions at the intersection of Marion and Lagimodière for the existing conditions (2019), 2025 background growth and 2030 background growth scenarios for both the AM and PM peak periods are shown in the figures and tables below.

Existing Conditions (2019)

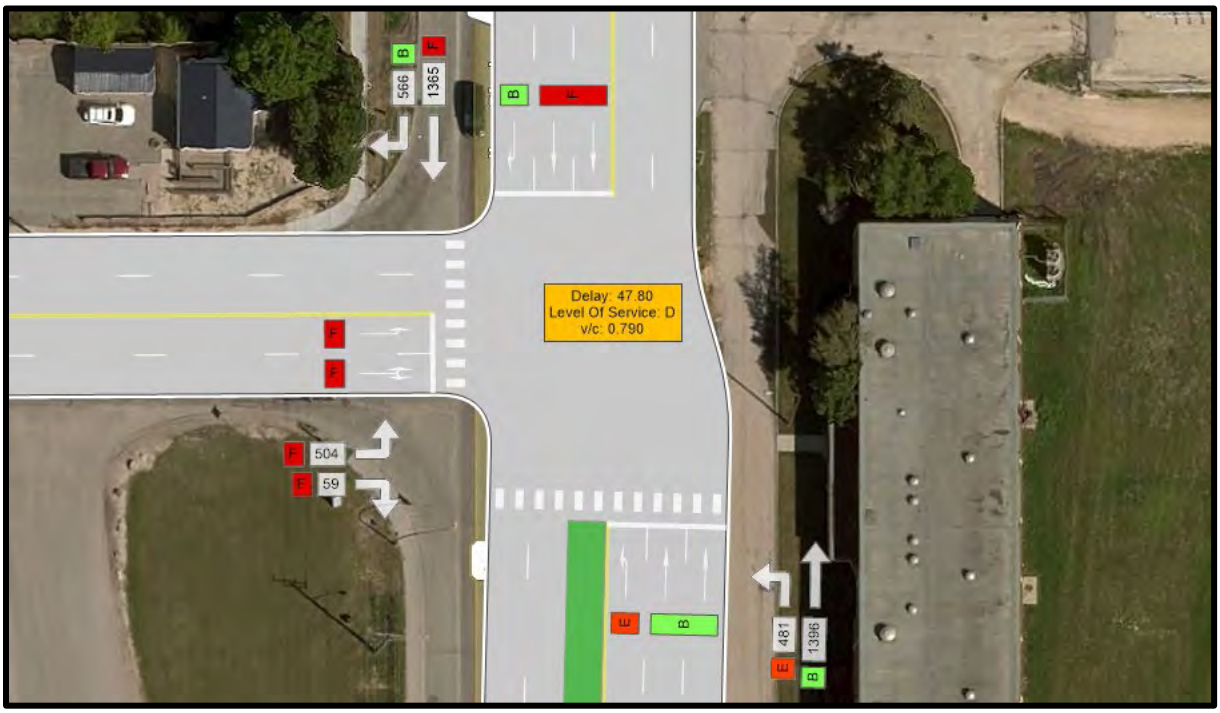


Figure 37: Marion St and Lagimodière Blvd - 2019 AM Background

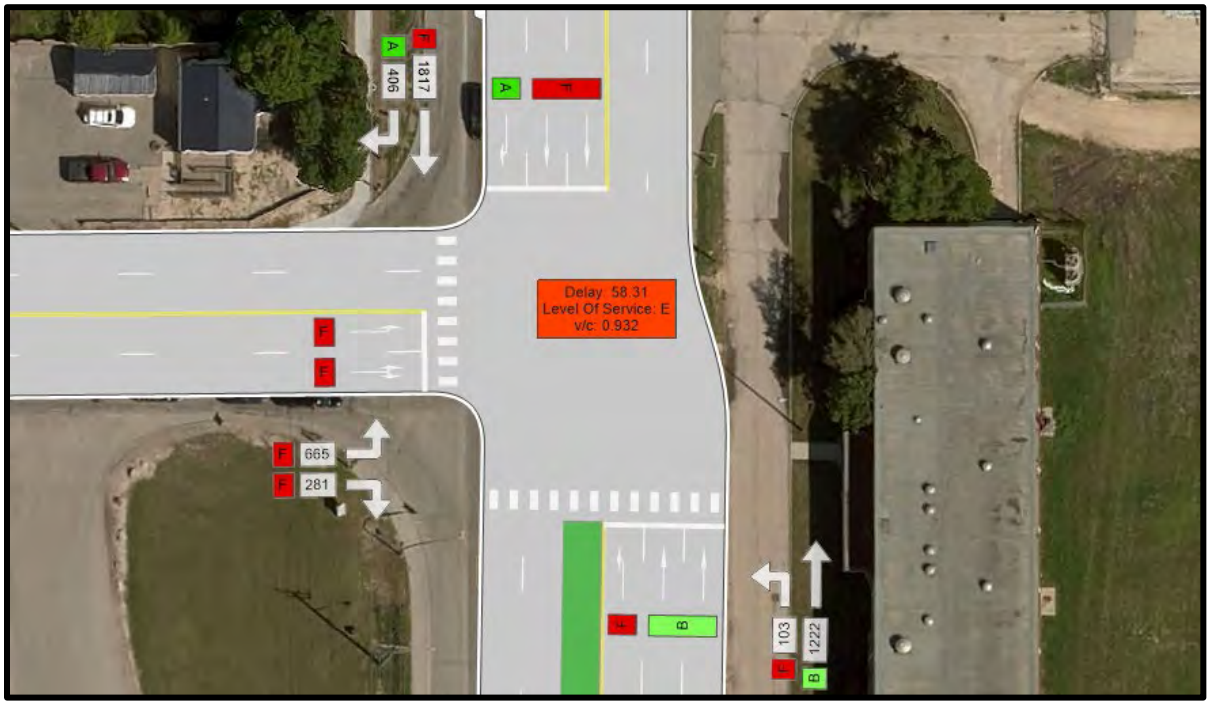


Figure 38: Marion St and Lagimodière Blvd - 2019 PM Background

Table 27: 2019 Existing Conditions Traffic Analysis at Marion St and Lagimodière Blvd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	E	56.06	0.86	F	170.79	1.19
NBT	B	10.12	0.59	B	17.33	0.61
SBT	F	71.48	1.03	F	73.75	1.06
SBR	B	16.42	0.59	A	2.47	0.32
EBL	F	106.57	1.03	F	88.43	0.99
EBR	F	110.17	1.03	F	105.01	1.06
Intersection	**D**	**47.80**	**0.790**	**E**	**58.31**	**0.932**

2025 Background Growth

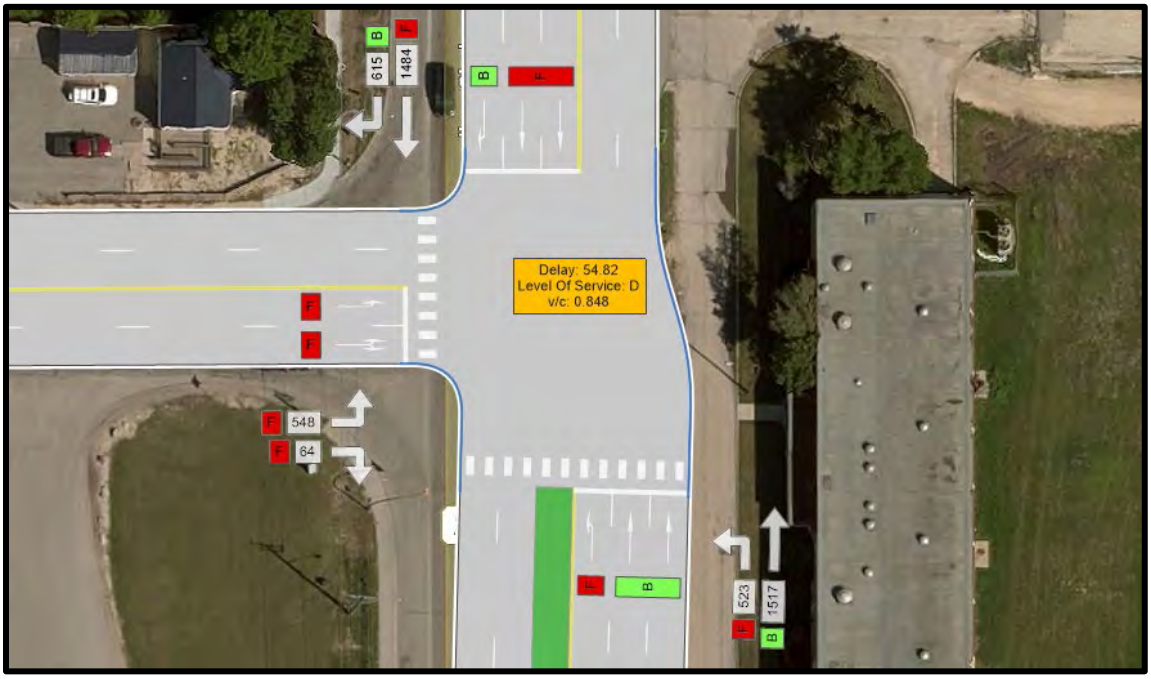


Figure 39: Marion St and Lagimodière Blvd - 2025 AM Background

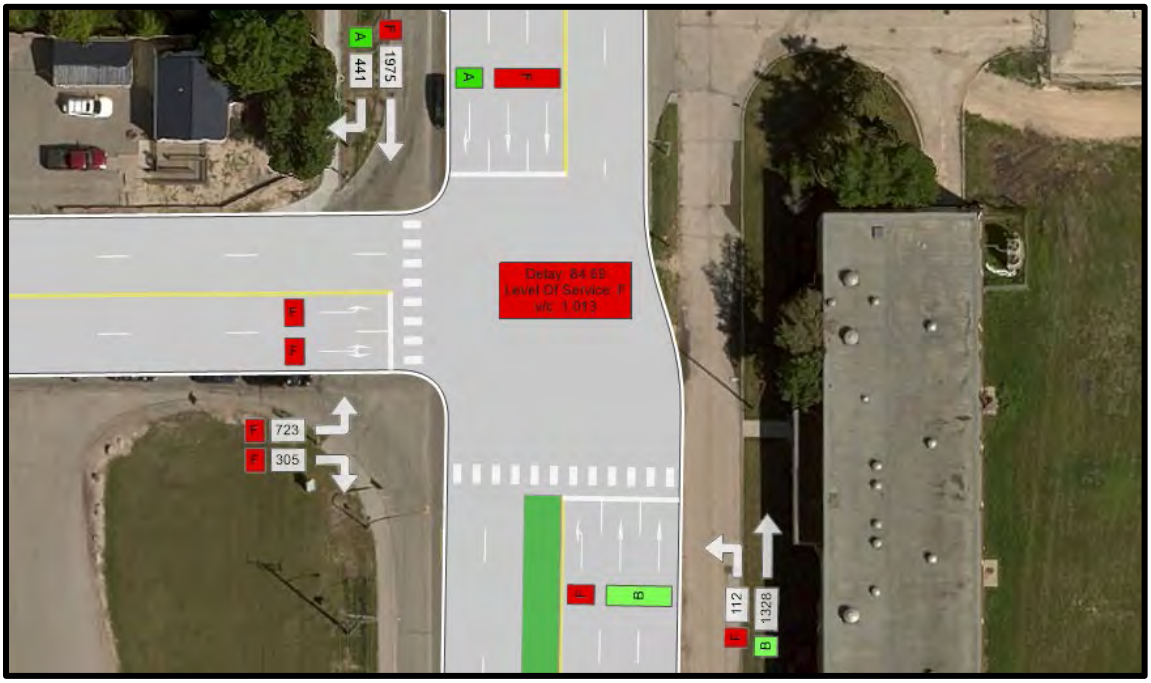


Figure 40: Marion St and Lagimodière Blvd - 2025 PM Background

Table 28: 2025 Background Growth Traffic Analysis at Marion St and Lagimodière Blvd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	118.47	1.09	F	109.21	1.01
NBT	B	12.17	0.66	B	19.88	0.66
SBT	F	69.56	1.03	F	128.42	1.19
SBR	B	13.27	0.6	A	3.17	0.36
EBL	F	110.05	1.04	F	102.73	1.05
EBR	F	114.39	1.04	F	130.76	1.12
Intersection	**D**	**54.82**	**0.848**	**F**	**84.69**	**1.013**

2030 Background Growth

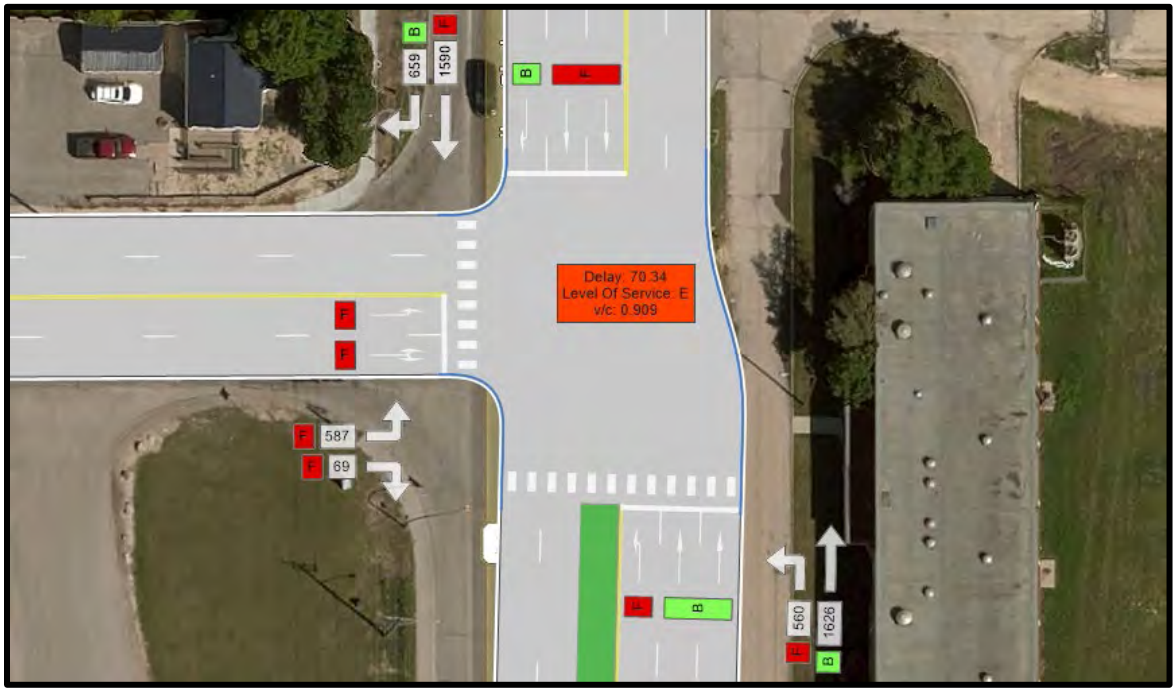


Figure 41: Marion St and Lagimodière Blvd - 2030 AM Background

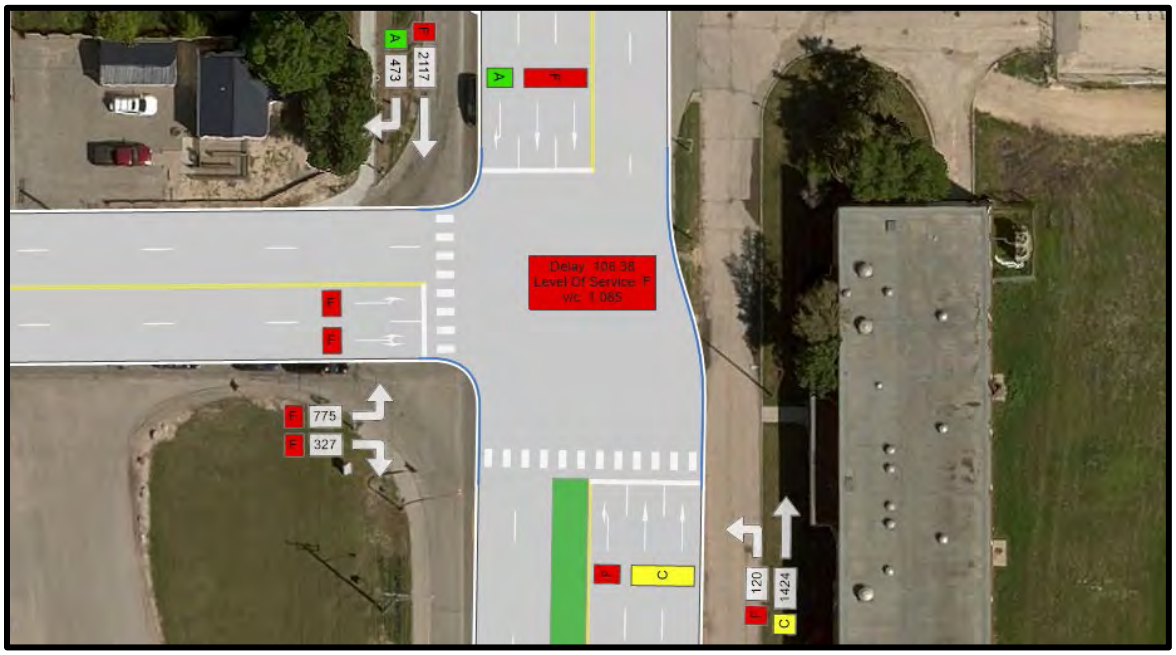


Figure 42: Marion St and Lagimodière Blvd - 2030 PM Background

Table 29: 2030 Background Growth Traffic Analysis at Marion St and Lagimodière Blvd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	150.27	1.18	F	128.55	1.07
NBT	B	13.24	0.71	C	21.23	0.71
SBT	F	95.67	1.11	F	165.45	1.28
SBR	B	14.34	0.64	A	3.42	0.38
EBL	F	135.91	1.11	F	137.94	1.12
EBR	F	141.4	1.12	F	161.02	1.20
Intersection	**E**	**70.34**	**0.909**	**F**	**106.38**	**1.085**

The analysis shows that the intersection is currently operating with significant delays in both the AM and PM peak periods. In particular the SB through movement is significantly delayed in the AM and PM peak. The EB approach also experiences significant delays during both periods. These concerns are only exacerbated with the projected traffic growth to 2025 and 2030, with the intersection expected to operate at LOS E and LOS F in the AM and PM respectively by 2030.

5.3.2 Mitigation Scenarios for Background Growth

2025 and 2030 Background Growth

To improve the operating conditions based on the background growth traffic scenario the following treatments were investigated for the Marion St and Lagimodière Blvd intersection. The improvements identified below were designed to provide an acceptable level of service for future 2025 background traffic:

- Add an exclusive EB right-turn lane with 100 m of storage and adjust the previous left/right turn curb lane to be a second exclusive left-turn lane
- Add an additional NB left-turn lane, matching the storage of 120 m to the existing NB left-turn lane
- Add an additional SB through lane on Lagimodière Boulevard that continues to Lagimodière & Maginot. As will be discussed in the next section, to provide an acceptable level at the intersection of Lagimodière and Maginot, an additional NB lane on Lagimodière would also be required and would be expected to continue to the intersection at Marion Street. Therefore, an additional NB through lane has also been included with the other proposed mitigation measures.
- Introduce overlap control for SB right-turn lane (corresponding to all EB traffic movements) and for the EB right-turn lane (corresponding to the NB left-turn movement)

The proposed intersection configuration with mitigation measures is shown in Figure 43.

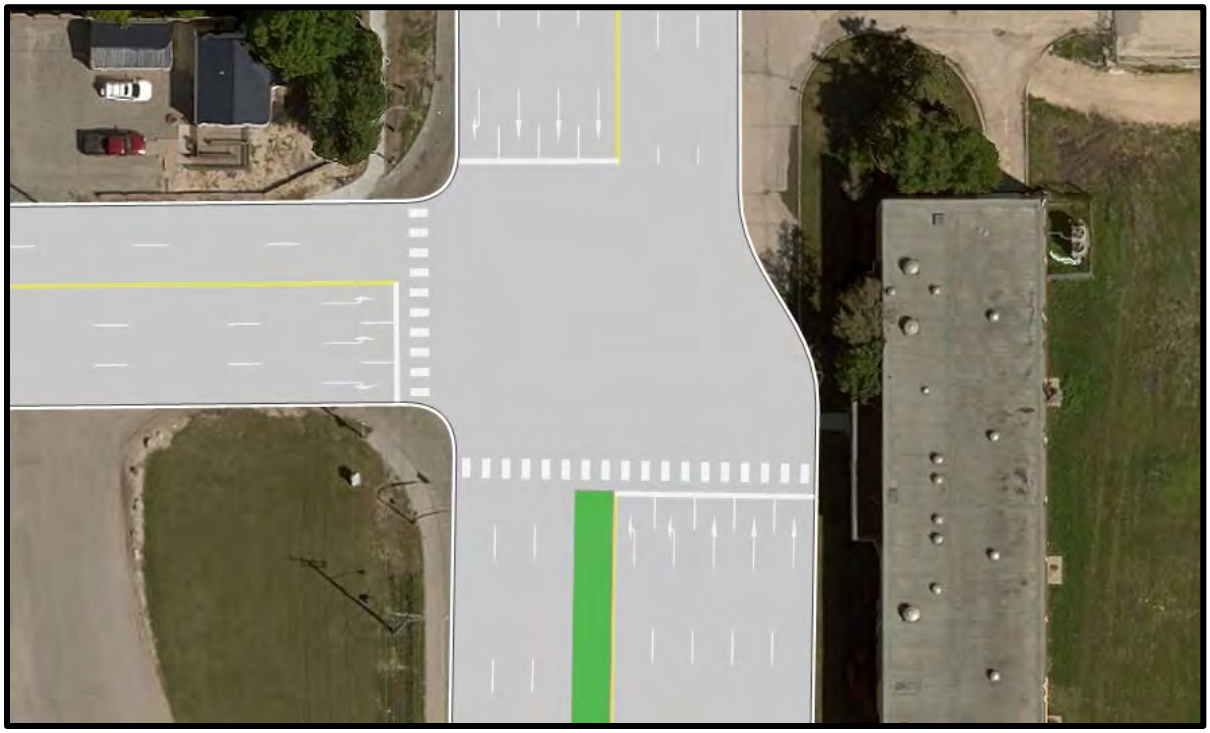


Figure 43: Marion St and Lagimodière Blvd - Intersection Configuration with Mitigation Measures

It was determined that the mitigation measures required to accommodate 2025 background growth are also sufficient to address the 2030 background volumes. Table 30 summarizes the LOS, v/c ratio and delay by movement and at the intersection level for the 2025 and 2030 mitigated background growth scenarios in the AM and PM peak periods respectively.

Table 30: Analysis of Mitigation Measures at Marion St and Lagimodière Blvd

	AM Peak						PM Peak					
	2025 Background with Mitigation			2030 Background with Mitigation			2025 Background with Mitigation			2030 Background with Mitigation		
Movement	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
NBL	D	45.83	0.84	D	44.02	0.85	D	39.85	0.43	D	44.25	0.45
NBT	B	10.34	0.5	B	10.78	0.54	B	10.84	0.48	B	11.56	0.5
SBT	C	32.54	0.81	D	43.78	0.89	D	35.73	0.96	D	41.45	0.98
SBR	B	11.07	0.6	B	14.99	0.66	A	3.81	0.39	A	4.17	0.41
EBL	D	40.63	0.76	D	42.38	0.81	C	32.87	0.83	D	38.39	0.89
EBR	B	15.53	0.11	B	14.42	0.11	B	19.55	0.49	C	23.18	0.54
Intersection	**C**	**24.84**	**0.672**	**C**	**26.98**	**0.720**	**C**	**24.75**	**0.685**	**C**	**28.42**	**0.734**

These extensive improvements reduce overall intersection delay in the 2025 scenario from 55 seconds to 25 seconds in the AM peak and from 85 seconds to 25 seconds in the PM peak. In 2030, with the mitigation measures in place the average intersection delay is projected to increase but still remain at an acceptable level (27 seconds in the AM and 28 seconds in the PM). With the improvements in place, no critical movements are identified for the 2025 or 2030 background growth scenarios.

5.3.3 Post-Development Scenarios

The traffic volumes and operating conditions at the intersection of Marion and Lagimodière for 2025 partial build out and 2030 full build out scenarios with the proposed mitigation measures to address 2025 and 2030 background growth are shown in the figures and tables below.

2025 Partial Build-Out

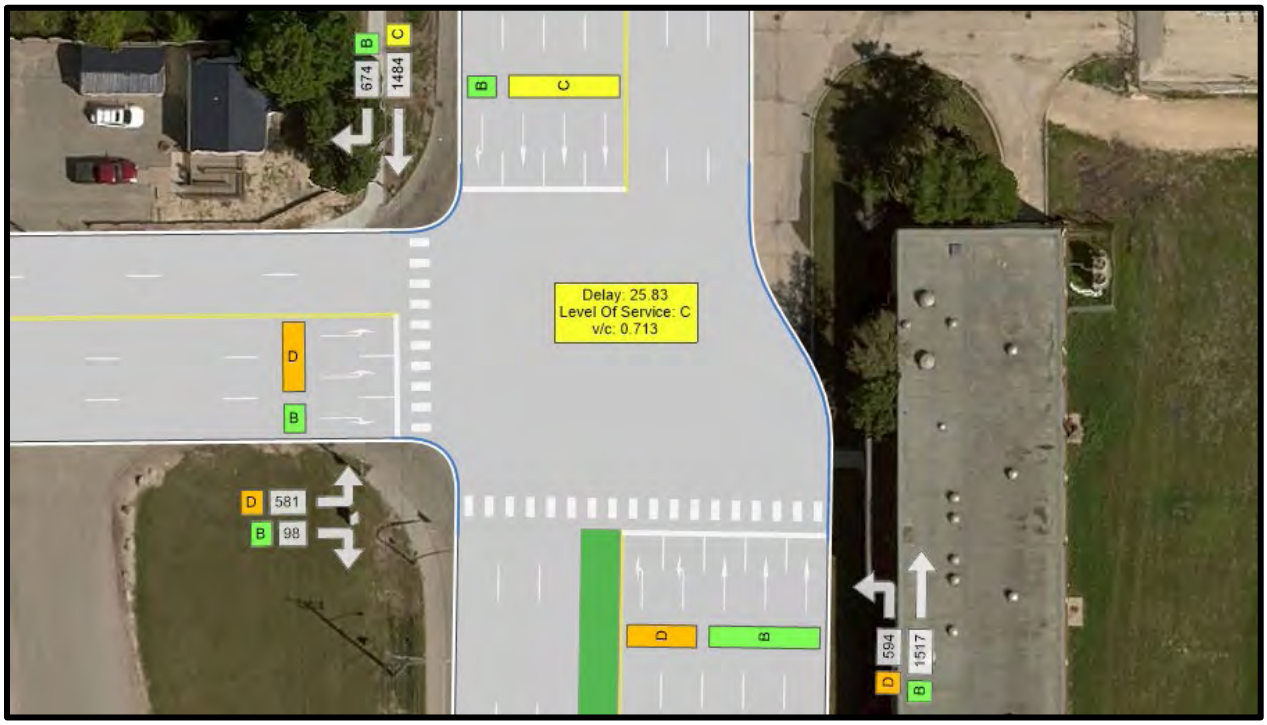


Figure 44: Marion St and Lagimodière Blvd - 2025 AM Partial Build Out with Mitigation Measures

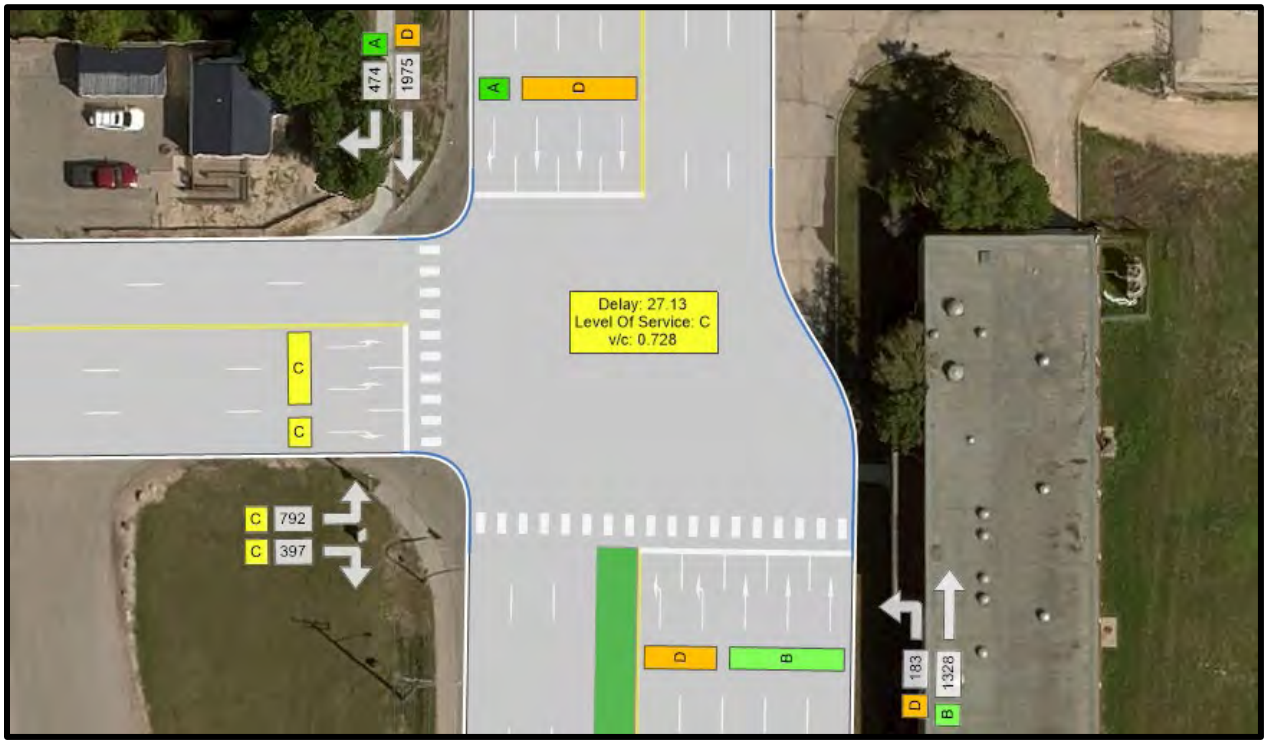


Figure 45: Marion St and Lagimodière Blvd - 2025 PM Partial Build Out with Mitigation Measures

Table 31: 2025 Partial Build Out with Mitigation Measures Traffic Analysis at Marion St and Lagimodière Blvd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	D	45.5	0.88	D	41.92	0.65
NBT	B	10.23	0.49	B	11.33	0.48
SBT	C	34.11	0.82	D	40.2	0.98
SBR	B	14.03	0.68	A	4.09	0.42
EBL	D	40.84	0.77	C	33.95	0.89
EBR	B	14.61	0.13	C	22	0.62
Intersection	**C**	**25.38**	**0.713**	**C**	**27.13**	**0.728**

2030 Full Build-Out

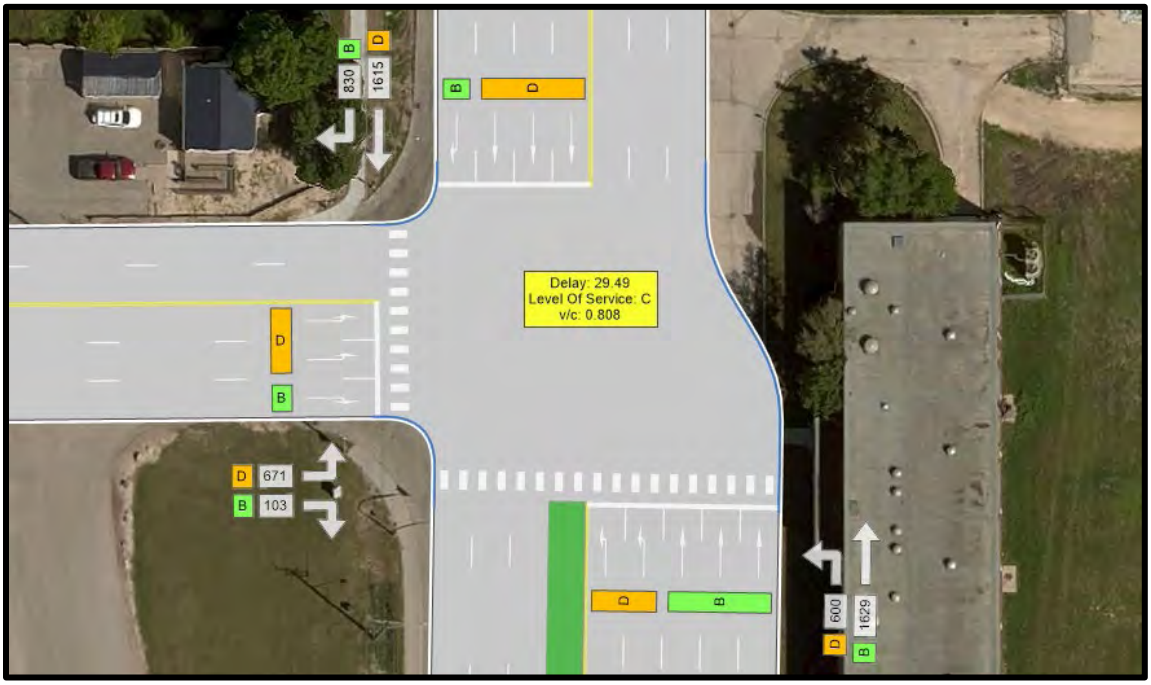


Figure 46: Marion St and Lagimodière Blvd - 2030 AM Full Build Out with Mitigation Measures

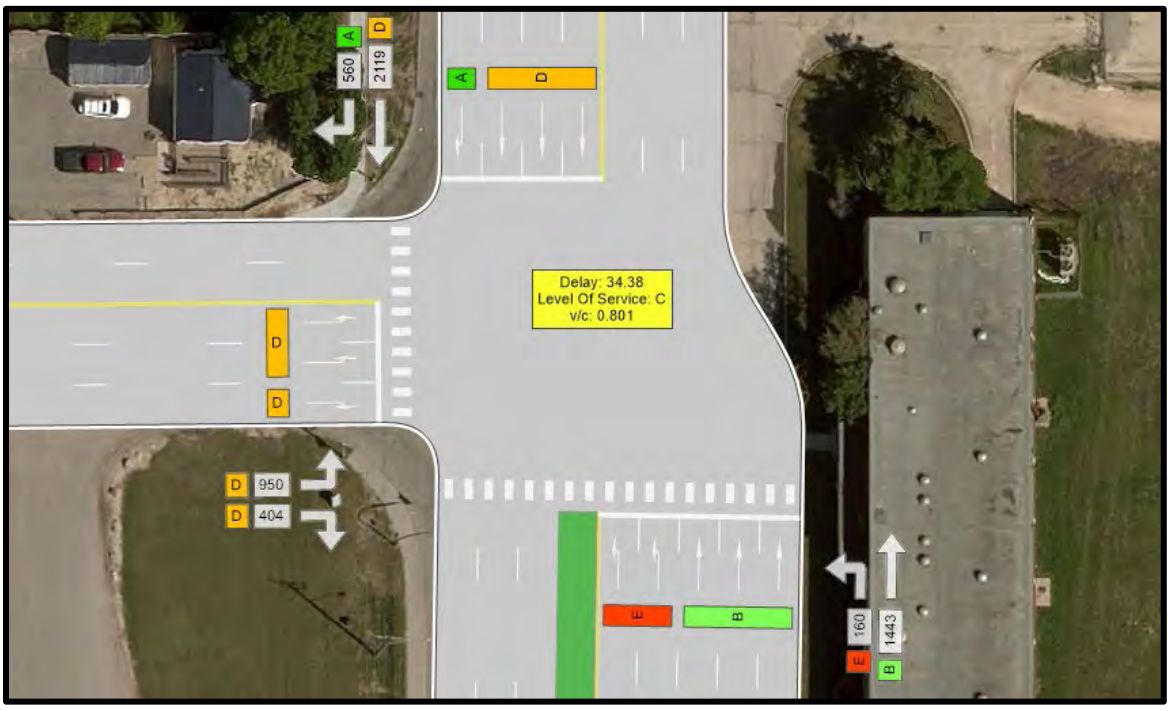


Figure 47: Marion St and Lagimodière Blvd - 2030 PM Full Build-Out with Mitigation Measures

Table 32: 2030 Full Build Out with Mitigation Measures Traffic Analysis at Marion St and Lagimodière Blvd

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	D	46.65	0.94	E	78.47	0.84
NBT	B	11.79	0.56	B	18.48	0.52
SBT	D	44.3	0.96	D	41.59	0.91
SBR	B	19.46	0.83	A	3.44	0.45
EBL	D	36.51	0.81	D	52.08	0.92
EBR	B	12.47	0.14	D	37.11	0.65
Intersection	**C**	**29.49**	**0.808**	**C**	**34.38**	**0.801**

The analysis of the partial and full build out scenarios show that with the proposed mitigation measures in place, the intersection is still expected to continue to operate at an acceptable level of service with the added development traffic. For the 2025 partial build out scenario, when development traffic is added to the improved intersection, the average intersection delay increases to 26 seconds in the AM Peak (from 25 seconds for background growth only) and to 27 seconds in the PM Peak (from 25 seconds for background growth only). With the more significant development traffic for the 2030 scenario, the improved intersection is expected to experience notable delays in the PM Peak for the NBL movement. However the level of service for this movements is still projected to be better than existing conditions. Overall, the traffic conditions at the improved intersection for the 2030 scenario are projected to be acceptable, with an average delay of 30 seconds in the AM peak and 34 seconds in the PM peak. Thus no further mitigation measures are recommended at this intersection to accommodate development traffic.

5.3.4 Marion St and Lagimodière Blvd Summary

A summary of the intersection level results for each of the analysis scenarios is presented in Table 33 below.

Table 33: Marion St and Lagimodière Blvd - Summary of Analysis Scenarios

	AM Peak			PM Peak		
Scenario	LOS	Delay	v/c	LOS	Delay	v/c
2019 BG (Existing)	D	47.80	0.790	E	58.31	0.932
2025 BG	D	54.82	0.848	F	84.69	1.013
2025 BG – Mitigated	C	24.84	0.672	C	24.75	0.685
2025 Partial Build Out - Unmitigated	E	71.14	0.913	F	91.16	1.054
2025 Partial Build Out - Mitigated	C	25.83	0.713	C	27.13	0.728
2030 BG	E	70.34	0.909	F	106.38	1.085
2030 BG – Mitigated	C	26.98	0.720	C	28.42	0.734
2030 Full Build Out - Unmitigated	F	89.63	0.988	F	140.21	1.212
2030 Full Build Out - Mitigated	C	29.49	0.808	C	34.38	0.801

As shown in the table above, if the extensive mitigation measures are implemented, the level of service at this intersection is expected to improve from existing conditions even with full development traffic.

5.4 LAGIMODIÈRE BOULEVARD AT MAGINOT STREET

5.4.1 Existing Conditions and Background Growth Scenarios

The traffic volumes and operating conditions at the intersection of Lagimodière Blvd and Maginot St for the existing conditions (2019), 2025 background growth and 2030 background growth scenarios for both the AM and PM peak periods are shown in the figures and tables below.



2019 Existing Conditions:

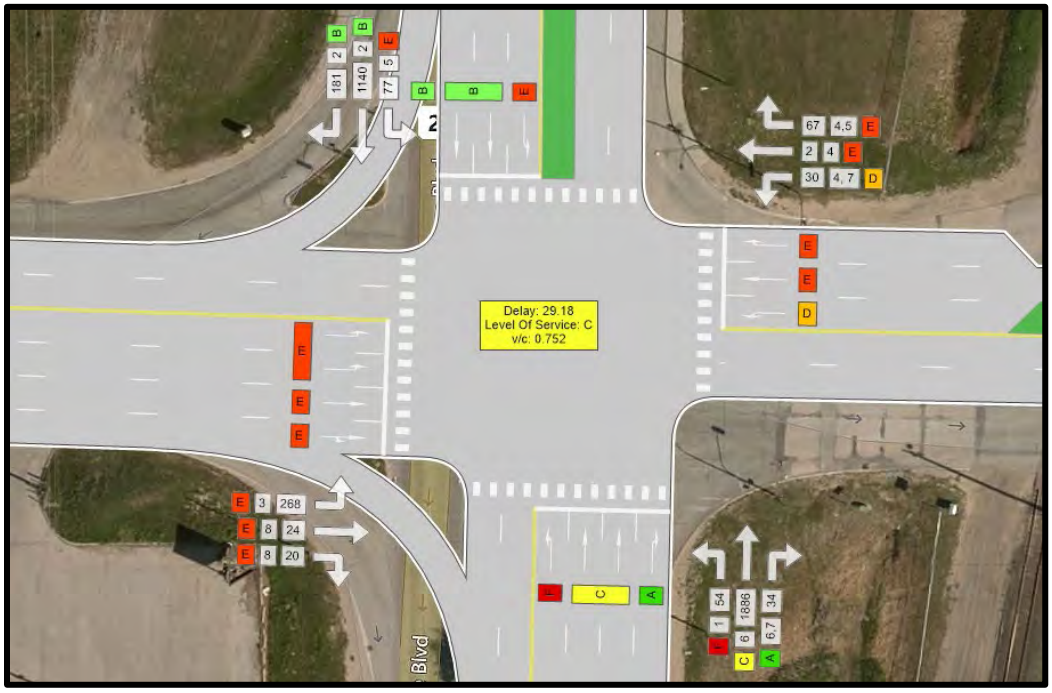


Figure 48: Lagimodière Blvd at Maginot St - 2019 AM Background

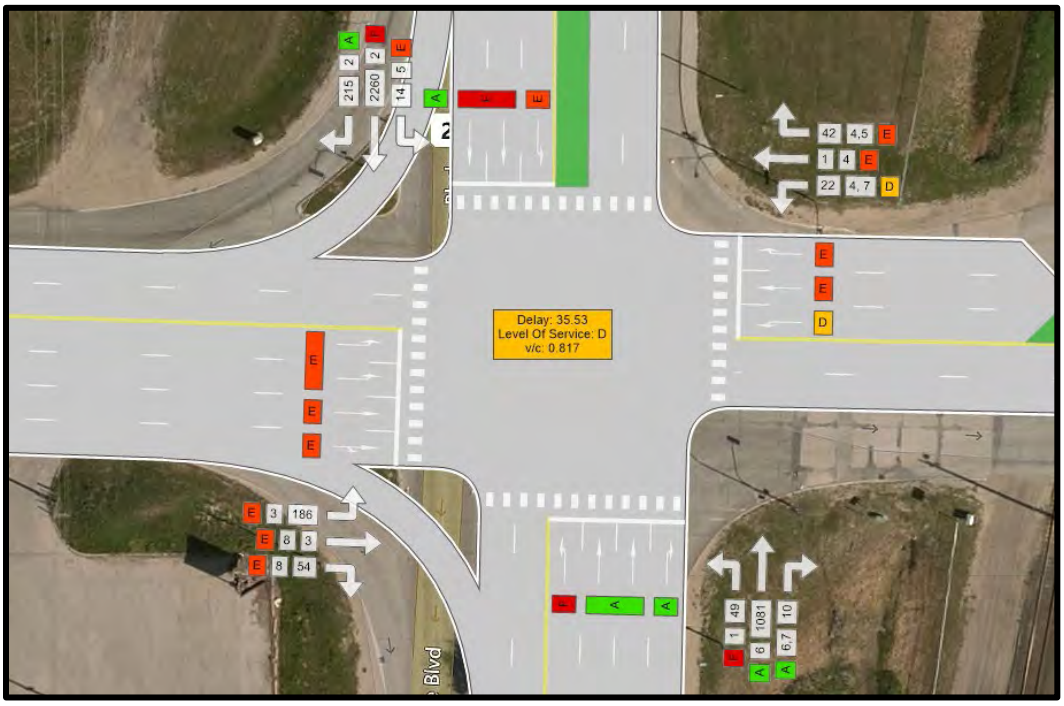


Figure 49: Lagimodière Blvd at Maginot St - 2019 PM Background

Table 34: 2019 Existing Conditions Traffic Analysis at Lagimodière Blvd and Maginot St

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	85.78	0.82	F	87.88	0.82
NBT	C	29.04	0.91	A	9.96	0.47
NBR	A	6.4	0.03	A	3.85	0.01
SBL	E	77.2	0.79	E	76.86	0.45
SBT	B	14.81	0.56	F	44.94	1.02
SBR	B	10.62	0.2	A	8.98	0.22
EBL	E	67.94	0.85	E	69.24	0.8
EBT	E	56.53	0.12	E	58.8	0.02
EBR	E	56.65	0.13	E	63.1	0.44
WBL	D	48.22	0.1	D	51.56	0.09
WBT	E	65.55	0.03	E	65.99	0.02
WBR	E	55.68	0.34	E	60.98	0.34
Intersection	**C**	**29.18**	**0.752**	**D**	**35.53**	**0.817**



2025 Background Growth

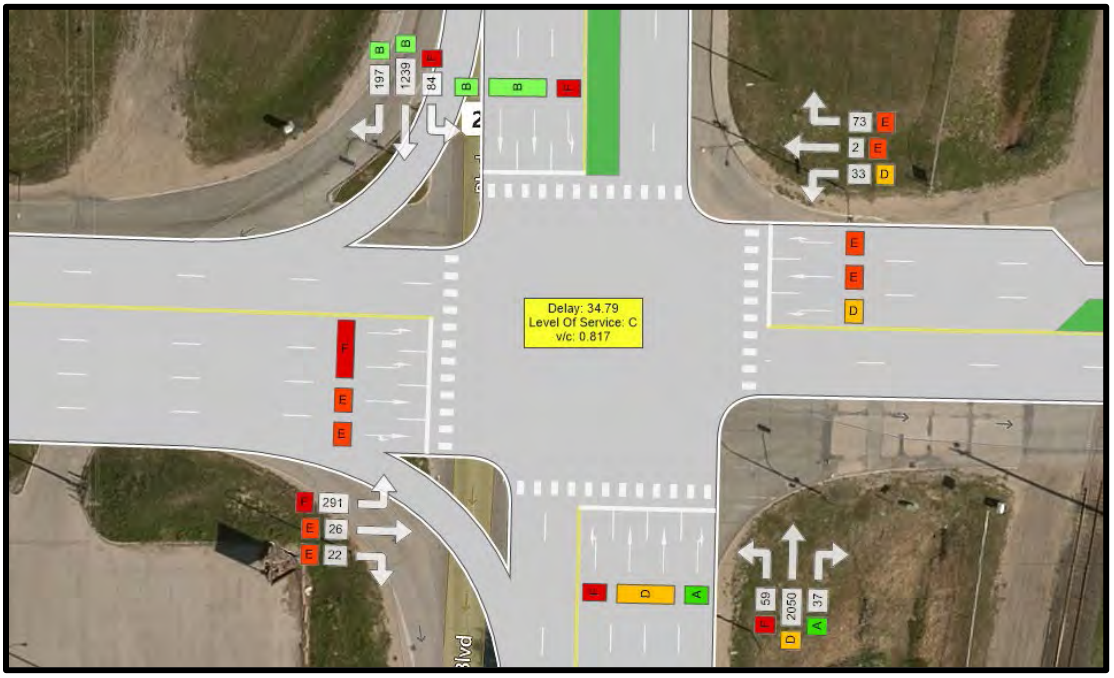


Figure 50: Lagimodière Blvd at Maginot St - 2025 AM Background

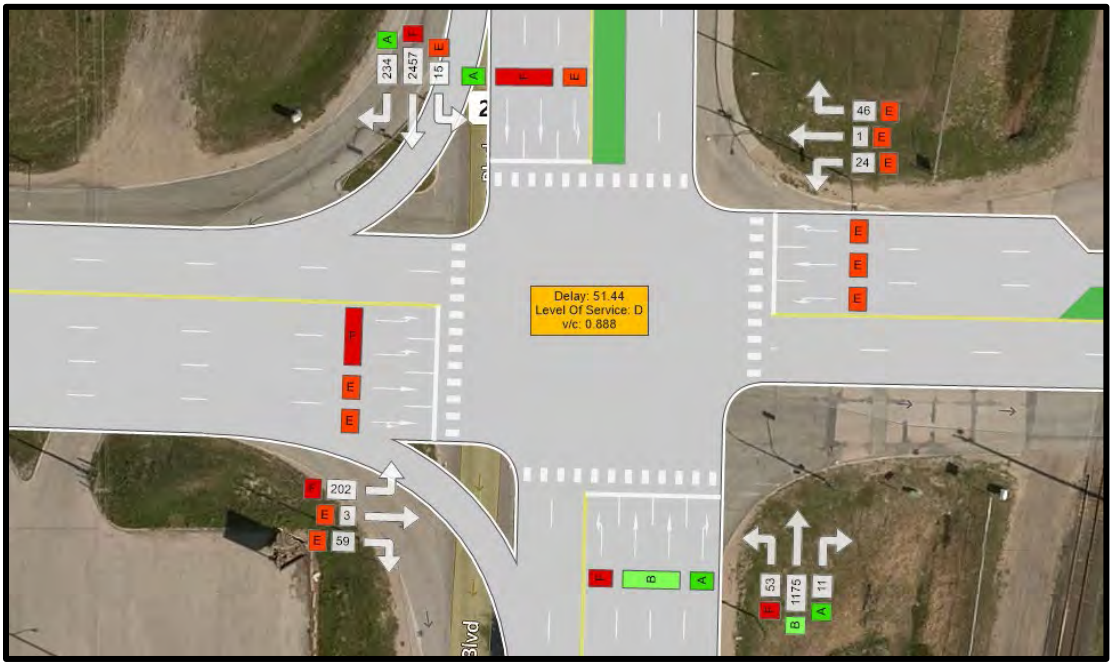


Figure 51: Lagimodière Blvd at Maginot St - 2025 PM Background

Table 35: 2025 Background Growth Traffic Analysis at Lagimodière Blvd and Maginot St

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	85.93	0.79	F	87.67	0.79
NBT	D	37.19	0.97	B	10.29	0.51
NBR	A	6.37	0.04	A	3.79	0.01
SBL	F	85.8	0.84	E	79.73	0.42
SBT	B	15.9	0.6	F	71.21	1.09
SBR	B	10.95	0.22	A	9.23	0.24
EBL	F	80.02	0.94	F	80.76	0.9
EBT	E	61.12	0.14	E	63.51	0.02
EBR	E	61.25	0.15	E	68.89	0.49
WBL	D	52.61	0.12	E	56.21	0.11
WBT	E	70.52	0.03	E	70.79	0.02
WBR	E	60.58	0.38	E	65.8	0.38
Intersection	**C**	**34.79**	**0.825**	**D**	**51.44**	**0.888**

2030 Background Growth:

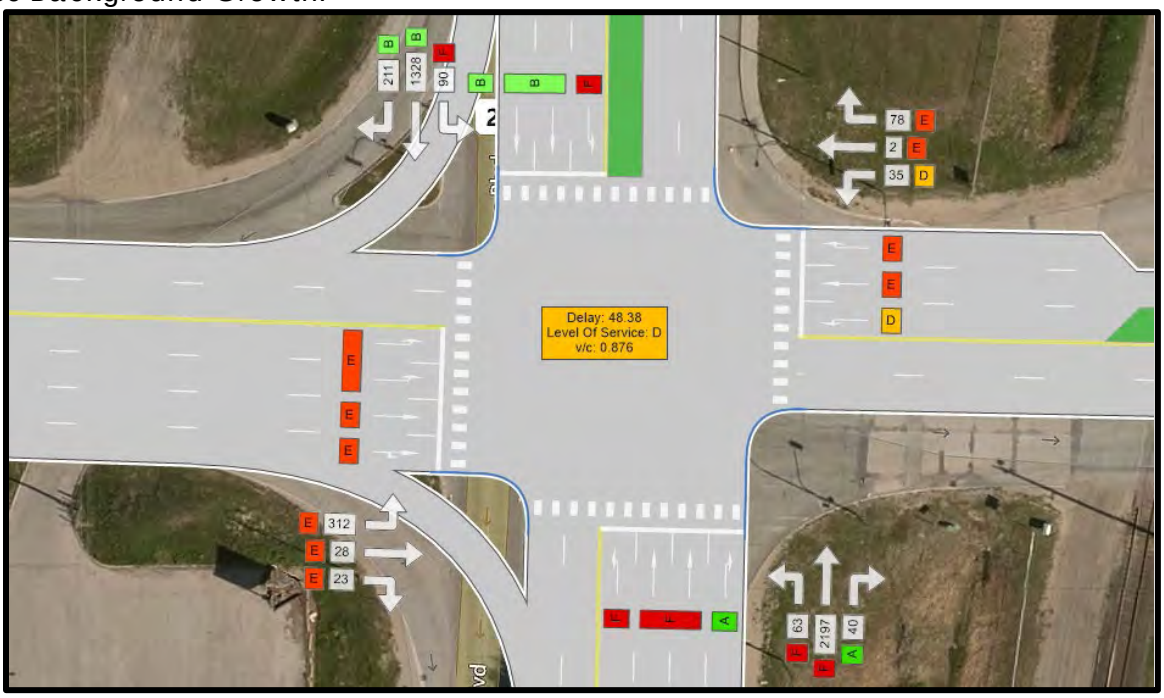


Figure 52: Lagimodière Blvd at Maginot St – 2030 PM Background

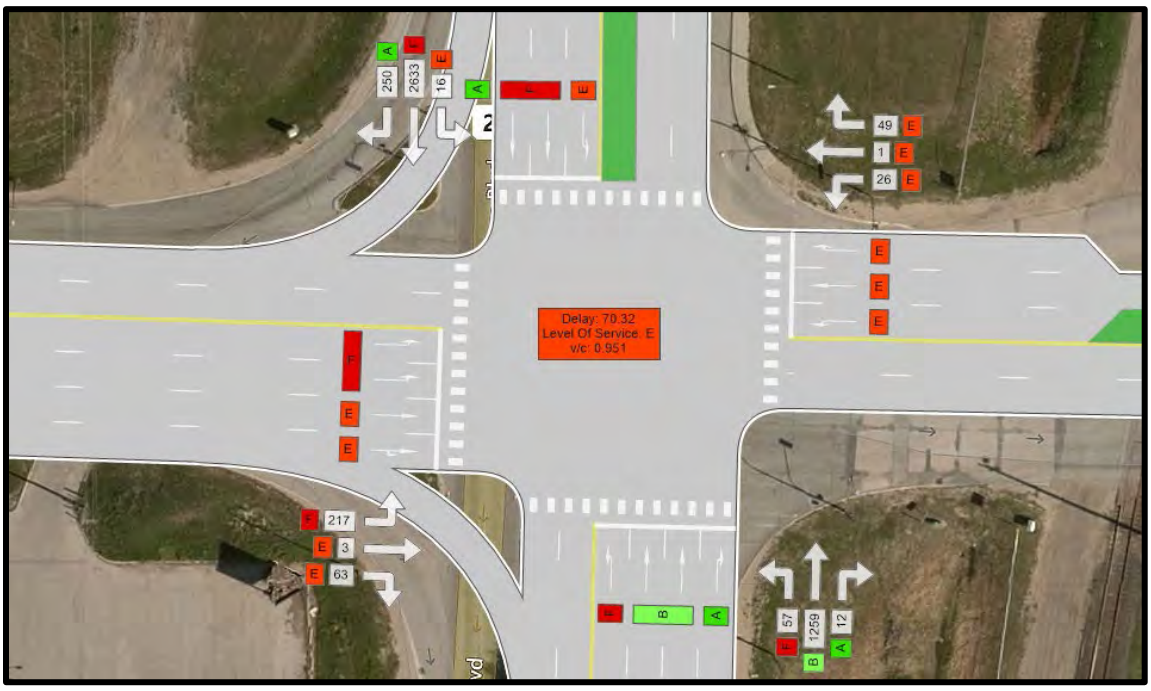


Figure 53: Lagimodière Blvd at Maginot St – 2030 PM Background

Table 36: 2030 Background Growth Traffic Analysis at Lagimodière Blvd and Maginot St

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	F	85.17	0.8	F	98.11	0.88
NBT	F	63.46	1.06	B	11.01	0.54
NBR	A	6.95	0.04	A	3.85	0.01
SBL	F	82.45	0.83	E	78.69	0.41
SBT	B	17.83	0.65	F	102.77	1.17
SBR	B	11.75	0.23	A	9.34	0.25
EBL	E	79.6	0.95	F	89.73	0.97
EBT	E	60.29	0.14	E	63.54	0.02
EBR	E	60.42	0.15	E	69.49	0.53
WBL	D	51.8	0.12	E	56.18	0.12
WBT	E	70.48	0.03	E	70.65	0.02
WBR	E	59.94	0.39	E	65.57	0.39
Intersection	**D**	**43.38**	**0.876**	**E**	**70.32**	**0.951**

The analysis shows that the intersection is currently operating at an acceptable level of service. Though almost all the side street movements are critical, this is considered reasonable for an intersection with many movements to accommodate and a much higher volume of traffic to serve on the major street. In 2025, the intersection is still expected to operate at LOS D overall in the PM peak, however the very high volume SB through movement is projected to experience significant delay (LOS F), which indicates that intersection is nearing capacity. Mitigation measures are considered necessary at that time or soon after to provide acceptable service. This issue becomes worse when traffic is projected to 2030, with the intersection expected to operate at LOS E in the PM.

5.4.2 Mitigation Scenarios

2025 and 2030 Background Scenarios

Maginot Street is currently fully developed with two through lanes and dual eastbound left turn lanes already in place. The measures to reduce the delays at this intersection to acceptable levels at this time are limited to addition of thru lane capacity on Lagimodière Blvd. As per the traffic analysis shown in the previous section, mitigation measures are considered necessary to accommodate 2025 background growth. Therefore, the effect of mitigation measures will be analyzed for the 2025 and 2030 scenarios. The treatments that have been investigated to improve the level of service for future background traffic include:

- Addition of a NB thru lane on Lagimodière Blvd
- Addition of a SB thru lane on Lagimodière Blvd

Table 37 summarizes the LOS, v/c ratio and delay by movement and at the intersection level for the 2025 and 2030 mitigated background growth scenarios in the AM and PM peak periods respectively.



Table 37: Analysis of Mitigation Measures at Lagimodière Blvd and Maginot St

	AM Peak						PM Peak					
	2025 Background with Mitigation			2030 Background with Mitigation			2025 Background with Mitigation			2030 Background with Mitigation		
Movement	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
NBL	E	62.49	0.79	E	65.67	0.79	E	74.01	0.8	F	81.65	0.79
NBT	C	20.39	0.79	C	22.94	0.83	A	9.03	0.38	A	9.26	0.39
NBR	A	6.64	0.04	A	7.1	0.04	A	3.96	0.01	A	4.04	0.01
SBL	E	57.24	0.79	E	61.62	0.8	E	67.82	0.47	E	74.52	0.43
SBT	B	13.86	0.49	B	14.85	0.51	B	18.5	0.82	C	20.52	0.84
SBR	B	11.92	0.25	B	12.56	0.26	A	9.79	0.25	B	10.07	0.26
EBL	E	57.66	0.94	E	59	0.93	E	64.94	0.88	E	75.21	0.9
EBT	D	40.17	0.13	D	43.5	0.13	D	50.35	0.02	E	58.56	0.02
EBR	D	40.27	0.14	D	43.6	0.14	D	54.82	0.47	E	63.68	0.49
WBL	C	32.33	0.09	D	35.52	0.1	D	43.26	0.09	D	51.31	0.11
WBT	D	45.74	0.02	D	50.59	0.02	E	56.09	0.02	E	65.79	0.02
WBR	D	36.9	0.3	D	41.2	0.33	D	51.11	0.33	E	60.74	0.37
Intersection	**C**	**22.51**	**0.628**	**C**	**24.48**	**0.674**	**B**	**19.46**	**0.662**	**C**	**21.57**	**0.709**

For the 2025 background growth scenario the additional thru lanes decrease intersection delay from 35 seconds to 23 seconds in the AM peak period and from 51 seconds to 19 seconds in the PM Peak period. With the mitigation measures in place the average intersection delay is projected to increase but still remain at an acceptable level in 2030 with an average delay of 25 seconds in the AM and 22 seconds in the PM. The side streets and left turning movements continue to experience significant delays even with the mitigation measures however this is not considered unusual for a large intersection with multiple protected movements such as this one.

5.4.3 Post-Development Scenarios

The traffic volumes and operating conditions at the intersection of Lagimodière and Maginot for 2025 partial build out and 2030 full build out scenarios with the proposed mitigation measures to address 2025 and 2030 background growth are shown in the figures and tables below.



2025 Partial Build-Out

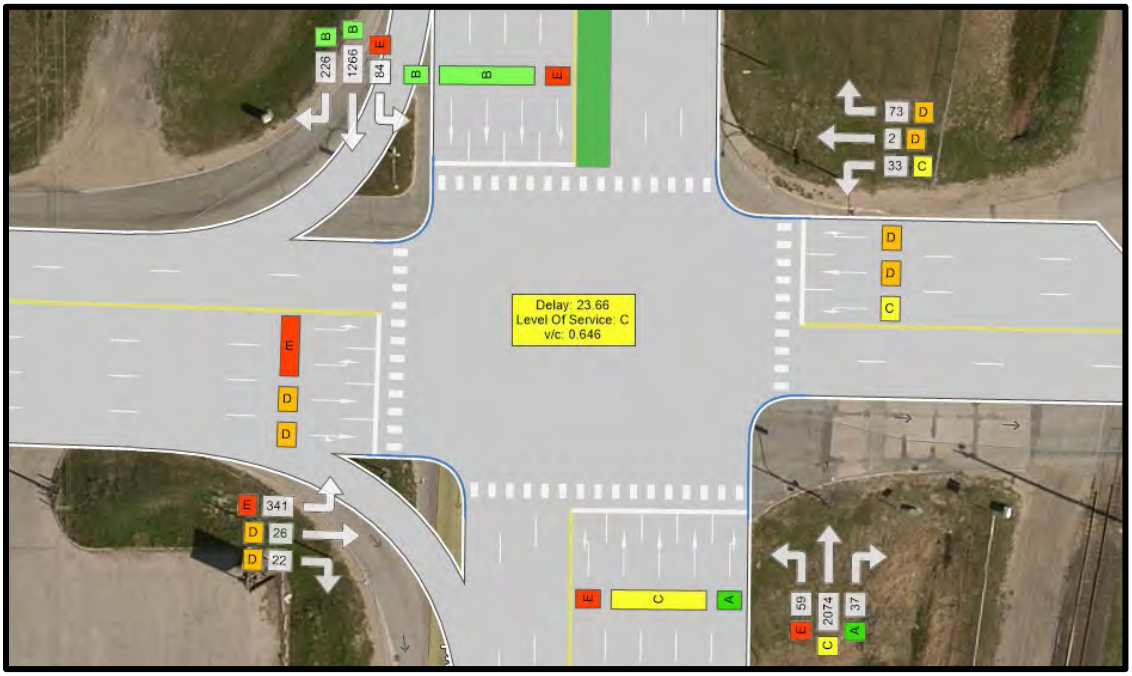


Figure 54: Lagimodière Blvd at Maginot St – 2025 AM Partial Build Out with Mitigation Measures

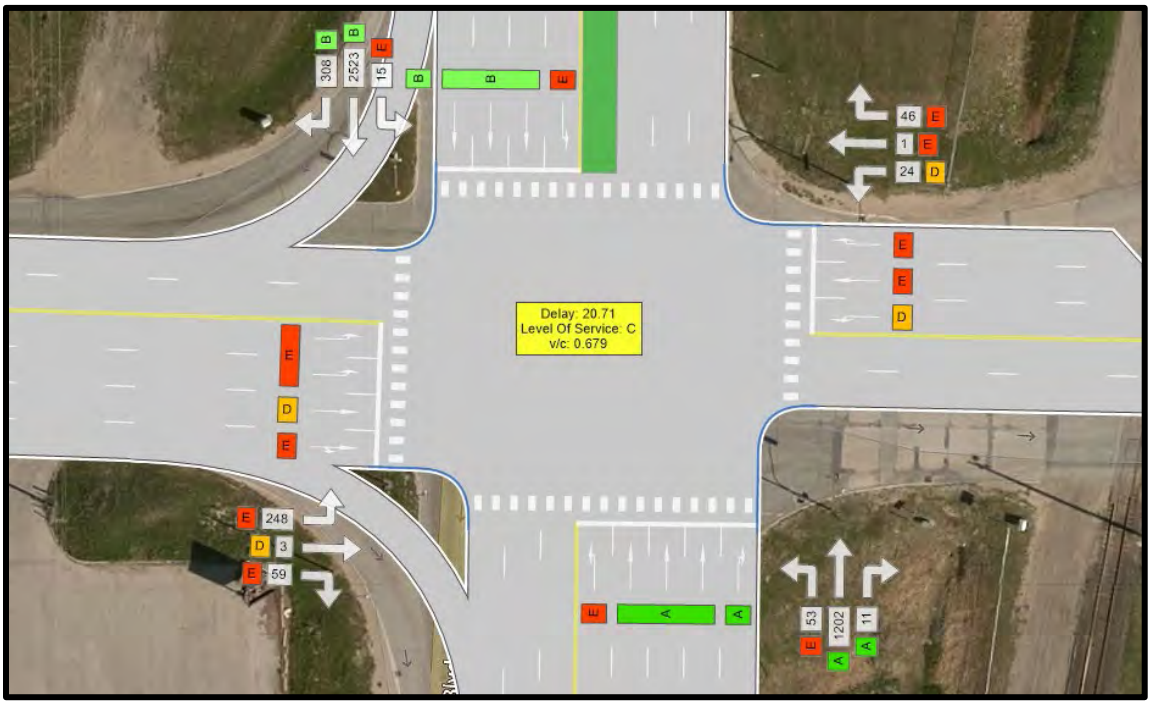


Figure 55: Lagimodière Blvd at Maginot St – 2025 PM Partial Build Out with Mitigation Measures

Table 38: 2025 Partial Build Out with Mitigation Measures at Lagimodière Blvd and Maginot St

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	E	63.58	0.74	E	74.52	0.74
NBT	C	21.63	0.79	A	9.38	0.38
NBR	A	7.26	0.04	A	4.17	0.01
SBL	E	63.1	0.8	E	72.06	0.46
SBT	B	14.26	0.47	B	19.23	0.82
SBR	B	12.57	0.27	B	10.65	0.32
EBL	E	55.77	0.91	E	70.9	0.92
EBT	D	42.48	0.11	D	53.52	0.02
EBR	D	42.56	0.12	E	57.59	0.43
WBL	C	34.73	0.09	D	46.42	0.09
WBT	D	50.67	0.03	E	60.98	0.02
WBR	D	41.51	0.31	E	55.73	0.32
Intersection	**C**	**23.66**	**0.646**	**C**	**20.71**	**0.679**



2030 Full Build-Out

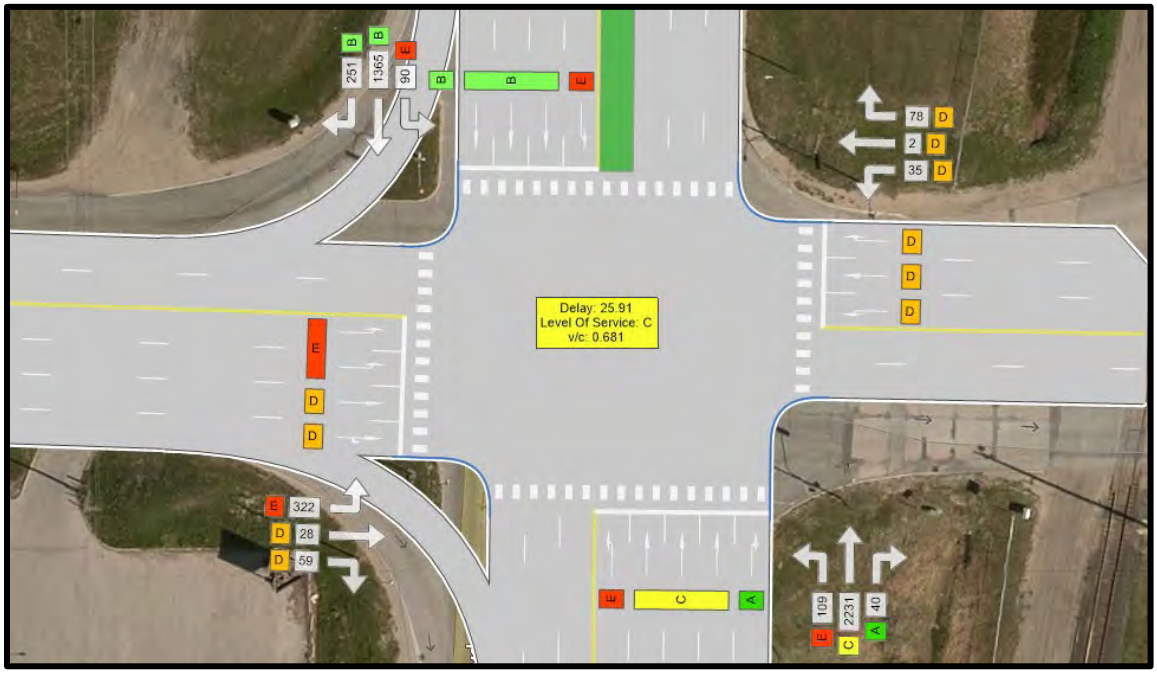


Figure 56: Lagimodière Blvd at Maginot St – 2030 AM Full Build Out with Mitigation Measures

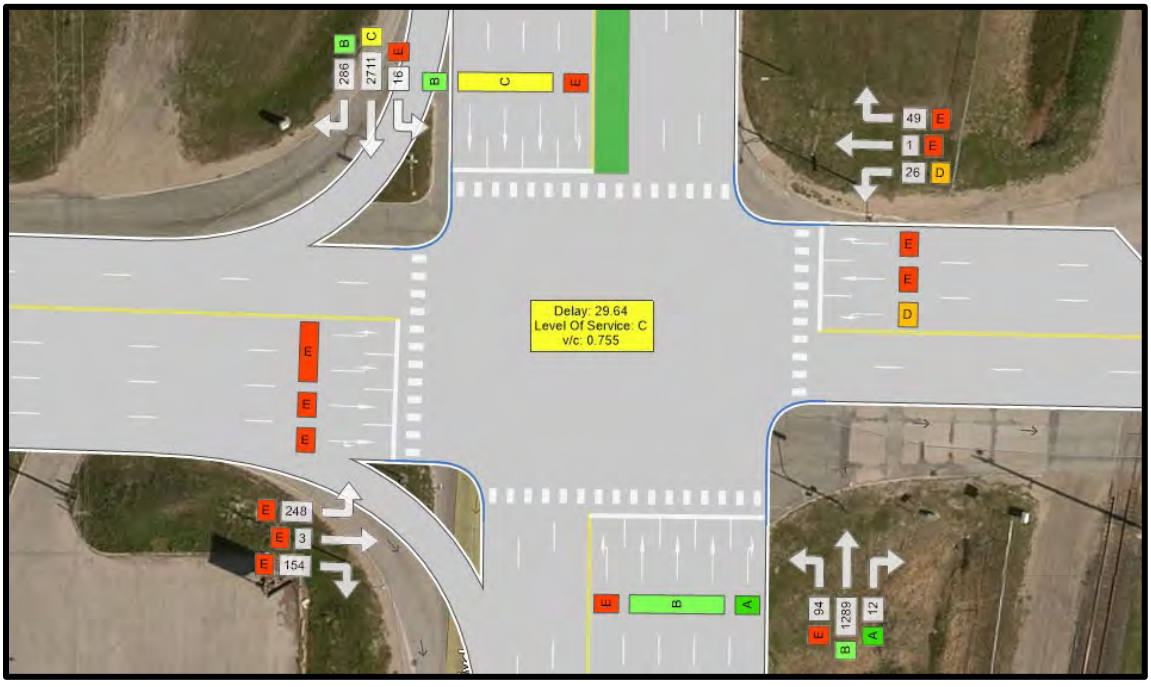


Figure 57: Lagimodière Blvd at Maginot St – 2030 PM full Build Out with Mitigation Measures

Table 39: 2030 Full Build Out with Mitigation Measures at Lagimodière Blvd and Maginot St

	AM Peak			PM Peak		
Movement	LOS	Delay	v/c	LOS	Delay	v/c
NBL	E	58.62	0.79	E	79.66	0.8
NBT	C	24.09	0.85	B	11.11	0.41
NBR	A	7.27	0.04	A	5.11	0.01
SBL	E	58.67	0.76	E	79.49	0.43
SBT	B	16.69	0.53	C	30.19	0.92
SBR	B	14.59	0.31	B	13.68	0.31
EBL	E	58.66	0.93	E	77.54	0.9
EBT	D	43.52	0.13	E	58.58	0.01
EBR	D	45.36	0.33	E	79.31	0.9
WBL	D	35.62	0.11	D	52.39	0.15
WBT	D	50.6	0.03	E	67.27	0.01
WBR	D	40.7	0.31	E	61.51	0.29
Intersection	**C**	**25.91**	**0.681**	**C**	**29.64**	**0.755**

The analysis of the partial and full build out scenarios shows that with the proposed mitigation measures in place, the intersection is still expected to continue to operate at an acceptable level of service with the added development traffic. For the 2025 partial build out scenario, when development traffic is added to the improved intersection, the average intersection delay remains at 24 seconds in the AM Peak (from 23 seconds for background growth only) and only increases to 21 seconds in the PM Peak (from 20 seconds for background growth only). For the 2030 scenario, the average intersection delay is projected to be 26 seconds in the AM Peak and 30 seconds in the PM Peak. It should be noted that for all scenarios (including the existing conditions), the level of service for Maginot St (EB/WB movements) is quite poor. This is a result of a long traffic cycle length required by the high traffic demand on Lagimodière Blvd and the priority given to this traffic (in terms of green time) as compared to traffic along Maginot St. However, with the given intersection configuration, this issue will persist with or without development traffic.

5.4.4 Lagimodière Blvd and Maginot St Summary

A summary of the intersection level results for each of the analysis scenarios is presented in Table 40 below.



Table 40: Lagimodière Blvd and Maginot St - Summary of Analysis Scenarios

	AM Peak			PM Peak		
Scenario	LOS	Delay	v/c	LOS	Delay	v/c
2019 BG (Existing)	C	29.18	0.752	D	35.53	0.817
2025 BG	C	34.79	0.817	D	51.44	0.888
2025 BG – Mitigated	C	22.51	0.628	B	19.46	0.662
2025 Partial Build Out - Unmitigated	D	39.75	0.837	E	60.60	0.911
2025 Partial Build Out - Mitigated	C	23.66	0.646	C	20.71	0.679
2030 BG	D	48.38	0.876	E	70.32	0.951
2030 BG – Mitigated	C	24.48	0.674	C	21.57	0.709
2030 Full Build Out - Unmitigated	D	54.97	0.887	F	101.19	1.004
2030 Full Build Out - Mitigated	C	25.91	0.681	C	29.64	0.755

5.5 MARION ST AND NICOLAS AVE

The intersection of Marion St and Nicolas Ave is located approximately 150 m east of the intersection of Marion St and Archibald St and is currently the only access point (entrance and exit) to several businesses located along Nicolas Ave. It is a T-intersection with stop control on the Nicolas Ave approach as shown in Figure 58.



Figure 58: Intersection of Marion St and Nicolas Ave

The level of service for each of the analysis scenarios in the AM and PM Peak periods are summarized in Table 41 and Table 42 below.

Table 41: AM Peak Period Traffic Analysis at Marion St and Nicolas Ave

	SBL	SBR	EBL	EBT	WBT	WBR	Intersection
2019 Existing							
Volume	6	7	31	956	1060	22	
LOS	F	C	B	A	A	A	**F**
Delay	105.43	21.78	11.19	0.00	0.00	0.00	**105.43**
2025 Background Growth							
Volume	7	8	34	1039	1152	24	
LOS	F	E	B	A	A	A	**F**
Delay	174.07	44.42	12.09	0.00	0.00	0.00	**174.07**
2025 Background Growth + Partial Build Out							
Volume	8	7	34	1162	1254	24	
LOS	F	F	B	A	A	A	**F**
Delay	267.63	79.97	12.88	0.00	0.00	0.00	**267.63**
2030 Background Growth							
Volume	7	8	36	1114	1235	26	
LOS	F	F	B	A	A	A	**F**
Delay	242.94	69.87	12.77	0.00	0.00	0.00	**242.94**
2030 Background Growth + Full Build Out							
Volume	9	7	36	1527	1501	27	
LOS	F	F	C	A	A	A	**F**
Delay	469.92	1020.56	15.59	0.00	0.00	0.00	**1020.56**



Table 42: PM Peak Period Traffic Analysis at Marion St and Nicolas Ave

	SBL	SBR	EBL	EBT	WBT	WBR	Intersection
2019 Existing							
Volume	14	21	7	1219	596	9	
LOS	F	C	B	A	A	A	**F**
Delay	61.07	19.10	11.69	0.00	0.00	0.00	**61.07**
2025 Background Growth							
Volume	15	23	8	1325	1050	5	
LOS	F	C	B	A	A	A	**F**
Delay	79.67	24.93	12.31	0.00	0.00	0.00	**79.67**
2025 Background Growth + Partial Build Out							
Volume	23	16	8	1472	1187	6	
LOS	F	F	B	A	A	A	**F**
Delay	66.21	166.03	14.08	0.00	0.00	0.00	**166.03**
2030 Background Growth							
Volume	16	24	8	1420	1125	6	
LOS	F	E	B	A	A	F	F
Delay	132.99	49.02	13.47	0.00	0.00	0.00	**132.99**
2030 Background Growth + Full Build Out							
Volume	24	18	8	1505	1830	8	
LOS	F	F	B	A	A	A	**F**
Delay	1255.82	1794.03	14.36	0.00	0.00	0.00	**1794.03**

Overall the intersection is operating without significant concern except for the SBL movement which is currently operating at LOS F in the AM and PM Peak periods. Delays for this movement are further increased with projected traffic growth. By 2030 the SBR movement is also expected to be critical. The additional traffic along Marion St generated by the proposed development further increases the delay. However, given the very low volumes served by this access point, and the current operating conditions, significant mitigation measures are not considered warranted. Consideration should be given to limit this intersection to a right in – right out operation, but with the impact of the train traffic, this may not be desirable either as traffic may still be able to exit to the east (assuming traffic would leave a gap) when traffic from the west is stopped by a train. Consideration could also be given to providing alternative access locations, but this would require private property.



6.0 PROPOSED NEW INTERSECTIONS

6.1 MARION ST AT LOUS RIEL WAY/DUPUY AVE

The primary access point to the development is proposed to be located at the existing intersection of Marion St and Louis Riel Way/Dupuy Ave. This existing intersection has three legs and is stop-controlled at Dupuy Ave. The intersection provides access to several light industrial businesses along Dupuy Ave. Figure 59 shows the existing intersection configuration, while Table 43 and Table 44 provide the operating conditions at the intersection for the existing and background growth scenarios.

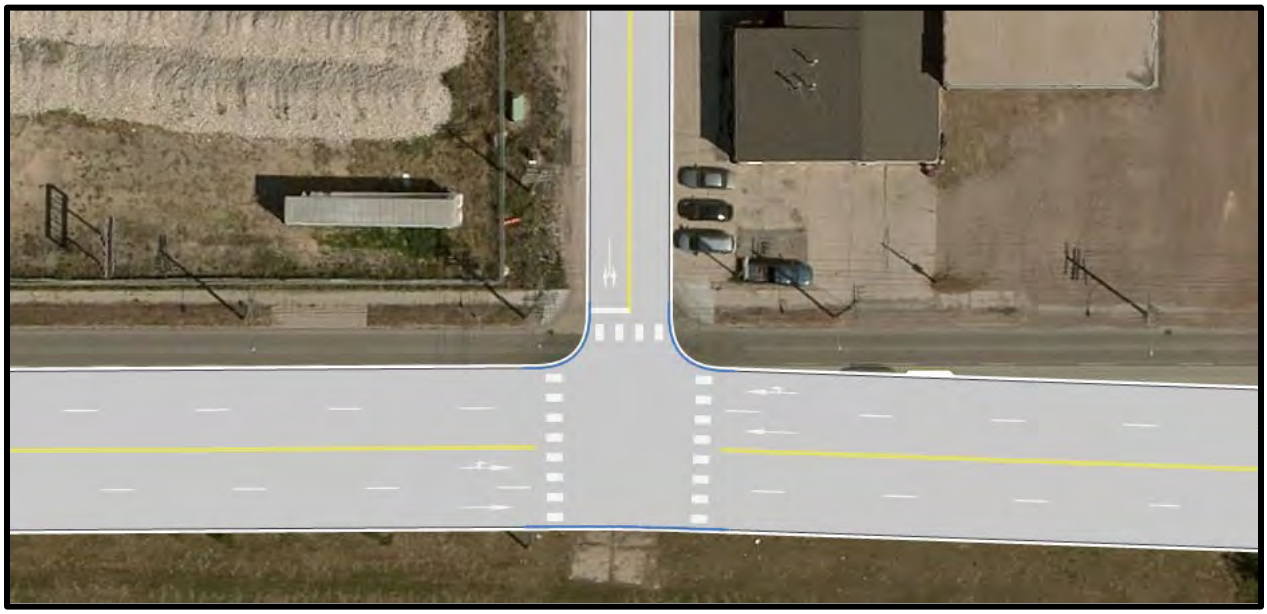


Figure 59: Marion St & Dupuy Ave Existing Intersection Configuration

Table 43: AM Peak Period Traffic Analysis at Marion St and Louis Riel Way/Dupuy Ave

	SBL	SBR	EBL	EBT	WBT	WBR	Intersection
2019 Existing							
Volume	11	11	15	915	1088	16	
LOS	E	F	B	A	A	A	**F**
Delay	95.93	33.51	12.88	0.00	0.00	0.00	**0.81**
2025 Background Growth							
Volume	12	12	16	995	1183	17	
LOS	F	F	B	A	A	A	**F**
Delay	155.60	60.33	14.14	0.00	0.00	0.00	**1.25**
2030 Background Growth							
Volume	13	13	17	1066	1268	19	
LOS	F	F	C	A	A	A	**F**
Delay	227.28	101.53	15.12	0.00	0.00	0.00	**1.87**

Table 44: PM Peak Period Traffic Analysis at Marion St and Louis Riel Way/Dupuy Ave

	SBL	SBR	EBL	EBT	WBT	WBR	Intersection
2019 Existing							
Volume	12	9	5	1275	1011	9	
LOS	F	F	C	A	A	A	**F**
Delay	187.03	72.28	15.67	0.00	0.00	0.00	**1.27**
2025 Background Growth							
Volume	13	10	5	1386	1099	10	
LOS	F	F	C	A	A	A	**F**
Delay	198.81	77.90	15.89	0.00	0.00	0.00	**1.36**
2030 Background Growth							
Volume	14	10	6	1485	1178	10	
LOS	F	F	C	A	A	A	**F**
Delay	310.03	148.04	17.10	0.00	0.00	0.00	**2.18**

The traffic analysis shows that the entire southbound approach is currently experiencing excessive delays and when traffic is projected to 2025 and 2030 these delays are only increased. However, as the volume of southbound traffic is quite low, these delays would likely continue to be considered acceptable.

For the future development scenarios, a south leg would be added to the intersection to provide access and egress to/from the new development. As this is the primary access point for the development, the intersection will be required to accommodate a high traffic volume entering and exiting the northbound approach in the AM and PM peak. A signalized intersection with the following configuration was analyzed for the development scenarios:

- Dual NB left-turn to handle PM peak traffic leaving the multi-use site and travelling west on Marion St
- An EB pocket right turn lane with 150 m of storage

The proposed intersection configuration is shown in Figure 22.



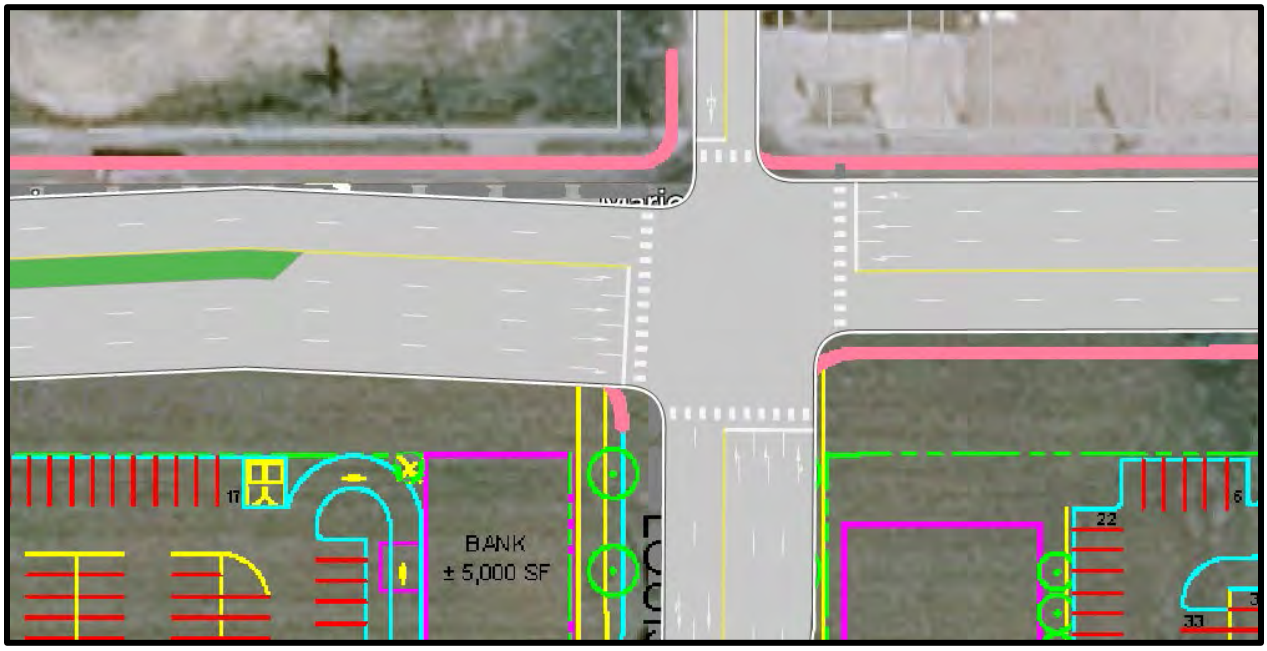


Figure 60: Marion St and Louis Riel Way/Dupuy Ave Proposed Signalized Intersection Configuration

The operating conditions at the intersection for the 2025 partial build out and 2030 full build out scenarios are shown in Table 45.

Table 45: Marion St and Louis Riel Way/Dupuy Ave Signalized Intersection Traffic Analysis

	AM Peak						PM Peak					
	2025 Partial Build Out			2030 Full Build Out			2025 Partial Build Out			2030 Full Build Out		
Movement	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
NBL	E	75.4	0.77	D	53.48	0.84	D	53.8	0.68	E	62.91	0.97
NBT	E	58.8	0.40	D	38.18	0.26	D	45.06	0.55	D	46.29	0.53
NBR	E	58.8		D	38.18		D	45.06		D	46.29	
SBL	E	78.26		E	62.14		E	61.19		E	72.91	
SBT	E	78.26	0.54	E	62.14	0.53	E	61.19	0.48	E	72.91	0.55
SBR	E	78.26		E	62.14		E	61.19		E	72.91	
EBL	A	5.92	0.06	A	9.1	0.06	A	5.69	0.03	B	10.43	0.03
EBT	A	8.99	0.47	B	14.14	0.55	B	14.29	0.68	C	26.42	0.86
EBR	A	6.23	0.12	B	13.75	0.46	A	8.21	0.15	B	16.85	0.51
WBL	A	5.41	0.17	A	8.66	0.23	B	13.24	0.33	C	34.10	0.50
WBT	A	9.68	0.54	B	15.08	0.61	A	9.84	0.48	B	16.87	0.61
WBR	A	9.69		B	15.1	0.62	A	9.84		B	16.87	
Intersection	**B**	**13.32**	**0.516**	**B**	**18.58**	**0.599**	**B**	**15.79**	**0.704**	**C**	**28.19**	**0.793**

The analysis shows that the proposed intersection configuration is expected to operate acceptably on an overall level without significant concern for all scenarios. However, in all scenarios, all the movements at the northbound approach (traffic exiting the development) are expected to be critical or close to critical and thus would experience significant delay. As an alternative and to provide better service to the traffic exiting the development, especially any transit service leaving the development, the operational effects of converting this intersection to a roundabout were analyzed.

The traffic analysis for the proposed roundabout configuration was performed using the intersection design aid software *SIDRA INTERSECTION 8.* Figure 59 shows the proposed roundabout configuration.

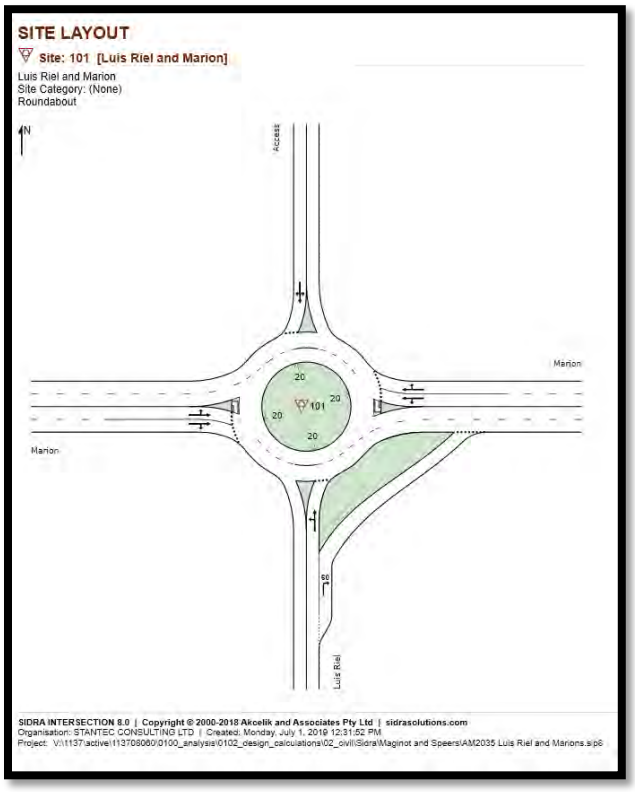


Figure 61 Roundabout Schematic Marion and Luis Riel

The analysis results for the 2025 and 2030 development scenarios for the proposed roundabout configuration are shown in Table 46 below. SIDRA traffic analysis reports are provided in Appendix E.

Table 46: Marion St and Louis Riel Way/Dupuy Ave Roundabout Traffic Analysis

	AM Peak						PM Peak					
	2025 Partial Build Out			2030 Full Build Out			2025 Partial Build Out			2030 Full Build Out		
Movement	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
NBL	B	10.2		B	11.0		B	11.8		B	16.4	
NBT	A	5.1	0.102	A	5.9	0.256	A	6.2	0.224	B	10.5	0.561
NBR	A	5.5		A	6.4		A	6.5		B	10.9	
SBL	B	11.6		B	12.9		B	11.7		B	12.8	
SBT	A	6.6	0.051	A	7.9	0.068	A	6.7	0.052	A	7.8	0.070
SBR	A	6.6		A	7.9		A	6.7		A	7.8	
EBL	A	7.9		A	8.3		A	8.5		A	8.9	
EBT	A	3.4	0.434	A	3.7	0.588	A	3.9	0.625	A	4.3	0.777
EBR	A	3.6		A	3.9		A	4.0		A	4.3	
WBL	A	8.2		B	11.1		A	8.5		B	13.0	
WBT	A	3.6	0.506	A	6.0	0.661	A	3.9	0.533	A	7.7	0.677
WBR	A	3.9		A	6.2		A	4.2		A	7.7	
Intersection	**A**	**4.0**	**0.506**	**A**	**5.6**	**0.661**	**A**	**4.6**	**0.625**	**A**	**7.2**	**0.777**

As demonstrated by the analysis results, the roundabout configuration provides a superior operation for all movements in all scenarios. For the 2030 PM full build out scenario the intersection is expected to still have significant unused capacity, operating at LOS A and with an average delay of 7.2 seconds. This is a notable improvement from the signalized intersection performance for the same scenario which was projected to operate at LOS C and with an average intersection delay of 28 seconds. Therefore, it is recommended that a roundabout be used for this intersection and that the City assist in its development by pursuing the utility relocations and property acquisition required.

As the roundabout would consist of two approach lanes in three of the four legs, enhanced pedestrian treatment, consisting of marked and potentially corridor treatments should be considered.

When a train is blocking the westbound movement of Marion, the roundabout may be impacted, however this would be the same as for a signalized or uncontrolled intersection. The roundabout design calls for a separate right turn cutoff to accommodate the northbound to eastbound movements. This movement would still be viable when the roundabout is full. During a train event, a conventional intersection would likely cause the queue to block access from the westbound left turn and the northbound left turn, so there is no disadvantage with a roundabout. During off peak times the roundabout would reduce overall delays and collision risk considerably.

6.2 SECONDARY ACCESS ON MARION ST

A secondary access intersection along Marion St is proposed approximately 275 m east of the primary access point at the intersection of Marion St & Louis Riel Way. It has been assumed that this access intersection will also be complete in the 2025 partial build out scenario. This roadway requires the acquisition of private land and negotiations have been initiated pending approval of the development.



Figure 62 shows the proposed configuration of the new intersection. Key features of the intersection configuration include:

- Stop controlled at NB approach
- Two lane approach for both EB and WB Marion St with share thru/right turn and thru/left turn curb lane for the EB and WB approaches respectively
- 30 m single right turn storage lane for NB development road
- One right turn only lane and one left turn only lane at NB intersection approach



Figure 62: Secondary Access Along Marion St – Proposed Intersection Configuration

The traffic volumes operating conditions at the new intersection for the 2025 Partial Build-Out and 2030 Full Build Out scenarios for the AM and PM peak period are summarized in Table 47 and Table 48 below.

Table 47: AM Peak Period Traffic Analysis of Secondary Access on Marion St

	AM Peak							
	2025 Partial Build Out				2030 Full Build Out			
Movement	Volume	LOS	Delay	v/c	Volume	LOS	Delay	v/c
NBL	2	F	108.43	0.05	8	F	410.58	0.58
NBR	24	B	13.38	0.06	59	B	14.98	0.15
EB	1072	A	0.00	0.00	1158	A	0.00	0.00
EBR	1	A	0.00	0.00	1	A	0.00	0.00
WBL	60	B	11.79	0.111	118	B	13.67	0.24
WB	1452	A	0.00	0.00	1573	A	0.00	0.00
Intersection		**F**	**108.43**	**0.054**		**F**	**410.58**	**0.585**

Table 48: PM Peak Period Traffic Analysis of Secondary Access on Marion St

	PM Peak							
	2025 Partial Build Out				2030 Full Build Out			
Movement	Volume	LOS	Delay	v/c	Volume	LOS	Delay	v/c
NBL	3	F	779.52	0.10	8	F	401.68	0.58
NBR	69	C	34.53	0.24	118	D	28.62	0.46
EB	1541	A	0.00	0.00	1673	A	0.00	0.00
EBR	1	A	0.00	0.00	1	A	0.00	0.00
WBL	15	B	18.07	0.04	49	C	17.84	0.16
WB	1138	A	0.00	0.00	1205	A	0.00	0.00
Intersection		**F**	**141.89**	**0.103**		**F**	**401.68**	**0.575**

The traffic analysis shows that in the AM peak periods, only the NBL movement experiences significant delay and operates at an LOS F. However, in the PM peak period, the entire NB approach (traffic exiting the development) is expected to operate with significant delay for the 2025 and 2030 scenarios. The level of service for this approach could be improved with signalization, however this would reduce the level of service provided to the much busier EB and WB movements. As this is the secondary access point to the development, the lower level of service for exiting vehicles is considered acceptable. More focus has been placed on improving service for those drivers entering/exiting at the intersection of Marion St and Louis Riel Way. Consideration may be given to restricting movement to right in right out only.

6.3 MAGINOT ST AND SPEERS RD

The 2025 and 2030 full-build out scenario includes a connection from the development to the intersection of Maginot St and Speers Rd, and thus access to Lagimodière Blvd via Maginot street. For the 2025 partial build out scenario it is assumed that this connection will not attract significant traffic or only be accessible for emergency and construction traffic, therefore access to the development has not been distributed via this intersection. Once full build out of the development occurs and the route becomes known, it may attract some short cutting traffic, those that wish to avoid the left turn at Marion. To mitigate this possibility measures, such as traffic calming, should be considered to increase trip time for through trips.

The current configuration at this intersection is four way stop control, with a single lane approach at the North, South and East legs and a two-lane approach at the West leg. The existing intersection configuration is shown in Figure 61 below.



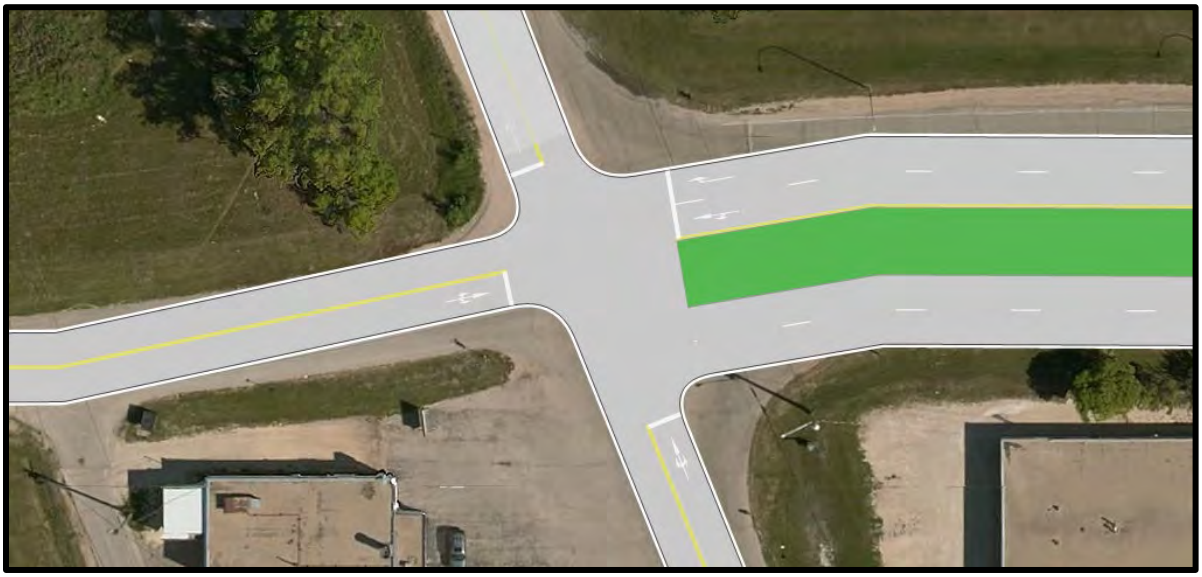


Figure 61: Maginot St and Speers Rd Existing Intersection Configuration

The operating conditions for the 2025 and 2030 development scenarios with the existing intersection configuration is provided in Table 49.

Table 49: Maginot St and Speers Rd All-Way Stop Traffic Analysis

	AM Peak				PM Peak			
	2025 Partial Build Out		2030 Full Build Out		2025 Partial Build Out		2030 Full Build Out	
Approach	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Northbound	A	9.81	B	14.68	A	9.49	B	14.66
Southbound	A	9.14	B	12.36	A	9.73	D	27.82
Eastbound	B	10.38	C	15.45	B	10.12	C	17.21
Westbound	B	10.22	B	12.42	B	15.09	C	22.73
Intersection	**B**	**10.07**	**B**	**13.77**	**B**	**12.06**	**C**	**22.00**

The traffic analysis shows that for the 2025 partial build out scenario the existing intersection configuration operates without significant concern. For the 2030 full build out scenario the intersection continues to operate at an acceptable level of service, however the southbound and westbound approaches are expected to experience some delay.

A roundabout analysis was also performed for this intersection for the development scenarios. The proposed roundabout configuration is shown in Figure 64. The anticipated traffic on Speers is approximately 10,000 vehicles per day, which would normally require a divided cross section, but the RBT analysis shows that a single lane south bound approach is sufficient for operational requirements.

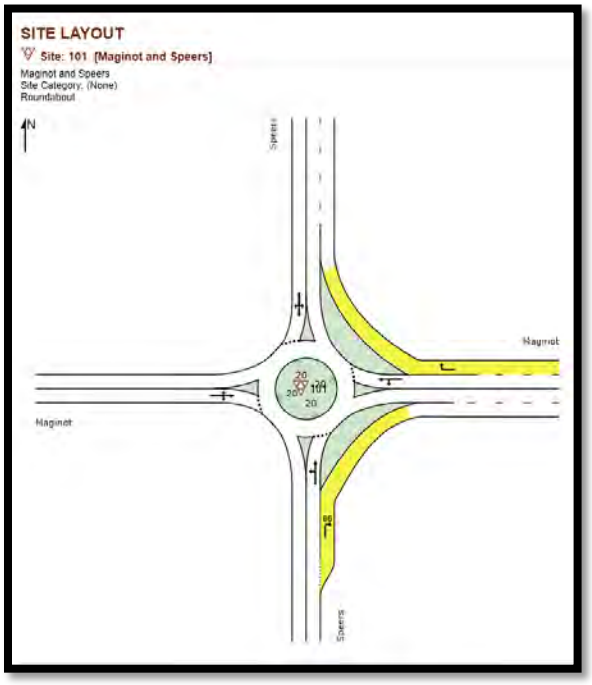


Figure 64 Roundabout Schematic Speers and Maginot

The analysis results for the 2025 and 2030 development scenarios for the proposed roundabout configuration are shown in Table 50 below.

Table 50: Maginot St and Speers Rd Roundabout Traffic Analysis

	AM Peak						PM Peak					
	2025 Partial Build Out			2030 Full Build Out			2025 Partial Build Out			2030 Full Build Out		
Approach	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
Northbound	A	2.7	0.107	A	3.1	0.102	A	2.8	0.069	A	3.4	0.071
Southbound	A	7.0	0.047	A	6.2	0.146	A	7.5	0.092	A	7.1	0.392
Eastbound	A	4.0	0.161	A	5.8	0.237	A	3.9	0.152	A	6.5	0.242
Westbound	A	4.2	0.130	A	4.2	0.149	A	5.3	0.215	A	4.7	0.234
Intersection	**A**	**3.9**	**0.161**	**A**	**4.6**	**0.237**	**A**	**4.4**	**0.215**	**A**	**5.6**	**0.392**

The roundabout analysis results show that a roundabout would provide LOS A to all movements for all scenarios, which is an improvement from all-way stop control. In the 2030 full build out scenario the intersection would have a significant amount of unused capacity and therefore would be capable of accommodating future traffic growth.

7.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

7.1 SUMMARY

The development of the MRS D site has been identified in OurWinnipeg (2011) as an important piece in addressing the densification and redevelopment of lands in close proximity to the downtown core. The potential for capturing a significant portion of trips to the transit network and other active modes is one of the positive driving forces behind the development. The opportunity to create a mixed-use development where there is a great opportunity for a live, work, learn, play community to be established is great.

The location of this site requires additional examination of the limited access potential due to the presence of the rail lines, the concerns expressed regarding access of emergency vehicles, also due to the presence of rail lines, and the current and projected vehicular capacity available along the external road network. Access, capacity and also emergency services response have been addressed in this report.

The access issues are handled by the proposed development site plan, with two connections to Marion St, one primary and one secondary, and a connection to Speers Rd, with ultimate connection to the Lagimodière Blvd and Maginot Ave intersection.

The study identified that the current traffic demand cannot be satisfied adequately with the current intersection geometry and traffic control. The addition of traffic from external developments already approved by the City (background growth) exacerbate the poor operating conditions over the study time frame. This situation is well understood by the city as there were numerous studies conducted in recent years attempting to find solutions to these issues. None have been accepted by Council.

The Transit Master Plan currently under way has identified possibilities which may increase modal split in the range of up to 30% for some areas. This could significantly reduce the pressure on existing infrastructure. However, this study provides possible options for improving the current and non-development operating conditions based on strategic additional infrastructure at key intersections and modifications to the signal timing based on the current mode share. **As noted, these are suggested solutions only, and should not to be considered the responsibility of the developer to initiate or provide significant contribution to. These however may be considered by the City as part of their upcoming review of traffic operations along Marion St.**

The study determined that the access to Marion St, via Louis Riel Blvd, will perform acceptably at full build out with a conventional intersection design, but will perform much better when a roundabout is considered. The roundabout will impact adjacent property and utilities, however, and will require participation by the City to resolve those challenges. The secondary access was determined to perform poorly using a stop-control. Consideration of limiting this access to right in right out is an option that is better supported by a roundabout at the Louis Riel intersection. A roundabout at this location has significant impact to adjacent property and was dropped from consideration.

Traffic volumes generated by the development were reduced by including a 10% transit mode share. The impact of increasing this mode share by providing a transit service that will be more attractive to the potential users was determined. Transit use from adjacent neighborhoods can be increased by other



service improvements, including a park and ride facility within or adjacent to the development site. These service improvements are being investigated through the Transit Master Plan that is currently underway. The impact of an improved mode share will have a positive effect on the intersection operating conditions and needs to be examined further to determine if it will be enough to defer capacity improvements to the external roads.

7.2 CONCLUSIONS

The development of the MRS D lands will generate new traffic and assigns it to an existing transportation network that has current (predevelopment) capacity constraints that result in congestion and long delays. The situation is exacerbated by train activity at several different crossings.

The current capacity constraints caused by anticipated increases to background growth can be mitigated by the suggested improvements in this report, and those improvements to the background traffic, which are not related to this development, are adequate to also accommodate the projected development traffic.

Improvements to the existing street network at the development access points are anticipated to allow the adjacent streets to retain reasonable operating conditions. The use of a roundabout at the Maginot and Speers intersection is superior to the current stop control condition and is being pursued by the proponent. Replacing the current proposed standard intersection treatment at Marion and Louis Riel with a roundabout greatly improves the operating conditions but requires assistance from the City related to property acquisition and utility relocation.

It is anticipated that the transit operations improvements being considered in the Transit Master Plan will have a positive impact to transit mode share, reducing the traffic demand in the study area, however the infrastructure improvements noted in this study to accommodate background traffic are still relevant.

7.3 RECOMMENDATIONS

The traffic generated by the proposed development can be accommodated by the transportation network, if the proposed or alternative mitigation to address current congestion issues are initiated and/or the anticipated transit system improvements are successful in shifting the way people move in Winnipeg.

The operation of Marion St and Louis Riel intersection is greatly improved if a roundabout intersection treatment is used to accommodate current and estimated future background traffic.

Improvements to the Marion, Lagimodière and Archibald corridors are being identified by the City as part of an upcoming study. Therefore, it is recommended that the City be allowed to use the findings within this report as a starting point to address background traffic growth along these corridors. It should be noted that addressing improvements to accommodate background growth will adequately address the demand created by this development.

The demand created by this development as a percentage of total demand at key intersections was presented in Section 3.3 and also shown below. These percentages may be used as a basis for discussion for potential contributions towards infrastructure upgrades.



Intersection	2025 Partial Build Out		2030 Full Build Out	
	AM	PM	AM	PM
Marion St at Archibald St	5%	6%	15%	14%
Marion St at Dupuy Ave	14%	17%	27%	28%
Marion St at Lagimodière Blvd	4%	5%	7%	7%
Lagimodière Blvd at Maginot St	3%	5%	4%	6%
Maginot St at Speers Rd	11%	16%	34%	43%



APPENDIX A

Transportation Engineering Background Information

Appendix A TRANSPORTATION ENGINEERING BACKGROUND INFORMATION

This appendix contains background information on transportation engineering concepts and performance measures

A.1 PERFORMANCE MEASURES

A.1.1 Highway Capacity Manual

The intersection capacity and level of service analysis was based in part on methodology from the *Highway Capacity Manual* (HCM). Several performance measures from the HCM methodology are detailed below:

- **Level of Service (LOS)** – Based on the average vehicle delay during a 15-minute analysis period. Levels of Service range from A (minimal delay) to F (unacceptable delay) and may be measured on an intersection, approach, or movement basis.

- **Degree of Saturation** – The ratio of demand flow rate (v) to maximum capacity (c). Where the v/c ratio is 1.0 or greater, the intersection is operating at full capacity and experiencing major congestion.

- **Vehicle Delay** – The average time that vehicles are delayed on an intersection, approach, or movement basis. Measured in seconds of delay per vehicle or total hours of delay during the peak hour being analyzed.

For design and planning purposes, LOS D or better under peak hour conditions is considered acceptable. Table A.1 and Table A.2 describe the characteristics of each LOS for signalized and unsignalized stop-controlled intersections, respectively, as listed in the HCM.

Table B.1: Signalized Intersections - HCM Level of Service Characteristics

HCM Level of Service	Average Signal Delay per Vehicle (sec/veh)	Characteristics
A	≤ 10	Free flow, low volumes and high speeds, most drivers can select own speed
B	> 10 and ≤ 20	Stable flow, speed restricted slightly by traffic
C	> 20 and ≤ 35	Stable flow, speed controlled by traffic
D	> 35 and ≤ 55	Approaching unstable flow, low speed
E	> 55 and ≤ 80	Unstable flow and speeds, volumes at/near capacity
F	> 80	Forced flow, low speed, volume above capacity

Table B.2: Stop Controlled Intersections - HCM Level of Service Characteristics

HCM Level of Service	Total Delay (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

APPENDIX B

2019 Traffic Volumes

2019 Traffic volumes

Intersection: Archibald St and Marion St
Count Date: 5/7/2019
Other notes: Count performed by Stantec

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	801	760	62	66	249	82	2	730	269	2	850	81
PM Peak Hour	305	401	64	75	789	86	1	990	783	1	847	99

Intersection: Marion St and Nicolas Ave
Count Date: 5/8/2019
Other notes: Count performed by Stantec

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	0	0	0	6	0	7	31	956	0	0	1060	22
PM Peak Hour	0	0	0	3	0	1	7	1219	0	0	966	5

Intersection: Marion St and Dupuy Ave/Louis Riel Way
Count Date: 5/21/2019
Other notes: Count performed by Stantec

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	0	0	0	11	0	11	15	915	0	0	1088	16
PM Peak Hour	0	0	0	12	0	9	5	1275	0	0	1011	9

Intersection: Marion St and Panet Rd
Count Date: N/A
Other notes: Calculated from surrounding counts

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	0	0	0	0	0	146	233	683	0	0	1074	0
PM Peak Hour	0	0	0	0	0	216	239	1046	0	0	687	0

Intersection: Marion St and Dawson Rd
Count Date: 5/14/2019
Other notes: Count performed by Stantec

	NWBL	NWBT	NWBR	SEBL	SEBT	SEBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	220	227	5	7	88	0	7	521	155	1	854	99
PM Peak Hour	138	86	26	57	175	0	3	825	218	3	549	28

Intersection: Panet St and Dawson Rd
Count Date: 5/16/2019
Other notes: Count performed by Stantec

	NWBL	NWBT	NWBR	SEBL	SEBT	SEBR	NEBL	NEBT	NEBR	SWBL	SWBT	SWBR
AM Peak Hour	1	295	37	5	64	51	41	192	0	31	94	19
PM Peak Hour	0	85	32	22	190	43	23	216	0	43	173	16

Intersection: Marion St and Lagimodiere Blvd
Count Date: 11/6/2014
Other notes: City of Winnipeg Count, 2019 volumes calculated using 1.4% annual growth rate

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	481	1396	0	0	1365	566	504	0	59	0	0	0
PM Peak Hour	103	1222	0	0	1817	406	665	0	281	0	0	0

Intersection: Maginot St and Lagimodiere Blvd
Count Date: 3/8/2016 & 3/9/2016
Other notes: City of Winnipeg Count, 2019 volumes calculated using 1.4% annual growth rate

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	54	1886	34	77	1140	181	257	23	19	29	2	64
PM Peak Hour	47	1037	10	13	2168	206	178	3	52	21	1	40

Intersection: Maginot St and Speers Rd
Count Date: 5/22/2019
Other notes: Count performed by Stantec

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM Peak Hour	4	16	151	33	5	8	21	123	8	69	76	87
PM Peak Hour	6	10	91	51	16	15	4	115	15	81	151	19

APPENDIX C

Mode Share Reduction Traffic Volume Analysis

AM Peak - 2025 Background Growth

Growth Factor 1.087

	Marion St at Archibald St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	871	826	67	72	271	89	0	794	292	0	924	88
	15%	822	780	64	68	256	84	0	749	276	0	873	83
	20%	774	734	60	64	241	79	0	705	260	0	821	78
	30%	677	643	52	56	211	69	0	617	227	0	719	68
	Marion St at Nicolas Ave											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	7	0	8	34	1039	0	0	1152	24
	15%	0	0	0	6	0	7	32	981	0	0	1088	23
	20%	0	0	0	6	0	7	30	924	0	0	1024	21
	30%	0	0	0	5	0	6	26	808	0	0	896	19
	Marion St at Dupuy Ave											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	12	0	12	16	995	0	0	1183	17
	15%	0	0	0	11	0	11	15	939	0	0	1117	16
	20%	0	0	0	11	0	11	14	884	0	0	1051	15
	30%	0	0	0	9	0	9	13	774	0	0	920	14
	Marion St at Panet St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	159	253	742	0	0	1167	1
	15%	0	0	0	0	0	150	239	701	0	0	1103	1
	20%	0	0	0	0	0	141	225	660	0	0	1038	1
	30%	0	0	0	0	0	123	197	577	0	0	908	1
	Marion St at Dawson Rd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	239	247	5	8	96	1	8	566	168	1	928	108
	15%	226	233	5	7	90	1	7	535	159	1	877	102
	20%	213	219	5	7	85	1	7	503	150	1	825	96
	30%	186	192	4	6	74	1	6	440	131	1	722	84
	Dawson Rd at Panet St											
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
Analysis Case	10%	45	209	0	34	102	21	5	70	55	1	321	40
	15%	42	197	0	32	97	20	5	66	52	1	303	38
	20%	40	186	0	30	91	18	5	62	49	1	285	36
	30%	35	162	0	26	79	16	4	54	43	1	249	31
	Marion St at Lagimodiere Blvd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	523	1517	0	0	1484	615	548	0	64	0	0	0
	15%	494	1433	0	0	1401	581	517	0	61	0	0	0
	20%	465	1349	0	0	1319	547	487	0	57	0	0	0
	30%	407	1180	0	0	1154	479	426	0	50	0	0	0
	Lagimodiere Blvd at Maginot St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	59	2050	37	84	1239	197	291	26	22	33	2	73
	15%	55	1936	35	79	1170	186	275	25	21	31	2	69
	20%	52	1822	33	74	1101	175	259	23	19	29	2	65
	30%	46	1595	29	65	964	153	227	20	17	25	2	57
	Maginot St at Speers Rd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	4	17	164	36	5	9	23	134	9	75	83	95
	15%	4	16	155	34	5	8	22	126	8	71	78	89
	20%	4	15	146	32	5	8	20	119	8	67	73	84
	30%	3	14	128	28	4	7	18	104	7	58	64	74

AM Peak - 2025 Site Generated

	Marion St at Archibald St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	49	26	0	0	0	48	0	0	80	22
	15%	0	0	46	25	0	0	0	45	0	0	76	21
	20%	0	0	44	23	0	0	0	43	0	0	71	20
	30%	0	0	38	20	0	0	0	37	0	0	62	17
	Marion St at Nicolas Ave												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	0	0	123	0	0	102	0
	15%	0	0	0	0	0	0	0	116	0	0	96	0
	20%	0	0	0	0	0	0	0	109	0	0	91	0
	30%	0	0	0	0	0	0	0	96	0	0	79	0
	Marion St at Dupuy Ave												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	95	0	61	0	0	0	0	3	116	71	4	0
	15%	90	0	58	0	0	0	0	3	110	67	4	0
	20%	84	0	54	0	0	0	0	3	103	63	4	0
	30%	74	0	47	0	0	0	0	2	90	55	3	0
	Marion St at Panet St												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	0	0	89	0	0	133	0
	15%	0	0	0	0	0	0	0	84	0	0	126	0
	20%	0	0	0	0	0	0	0	79	0	0	118	0
	30%	0	0	0	0	0	0	0	69	0	0	103	0
	Marion St at Dawson Rd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	3	0	0	0	0	0	0	67	22	0	130	0
	15%	3	0	0	0	0	0	0	63	21	0	123	0
	20%	3	0	0	0	0	0	0	60	20	0	116	0
	30%	2	0	0	0	0	0	0	52	17	0	101	0
	Dawson Rd at Panet St												
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
Analysis Case	10%	0	0	0	0	0	0	0	0	0	0	0	0
	15%	0	0	0	0	0	0	0	0	0	0	0	0
	20%	0	0	0	0	0	0	0	0	0	0	0	0
	30%	0	0	0	0	0	0	0	0	0	0	0	0
	Marion St at Lagimodiere Blvd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	71	0	0	0	0	59	33	0	34	0	0	0
	15%	67	0	0	0	0	56	31	0	32	0	0	0
	20%	63	0	0	0	0	52	29	0	30	0	0	0
	30%	55	0	0	0	0	46	26	0	26	0	0	0
	Lagimodiere Blvd at Maginot St												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	24	0	0	27	29	50	0	0	0	0	0
	15%	0	23	0	0	26	27	47	0	0	0	0	0
	20%	0	21	0	0	24	26	44	0	0	0	0	0
	30%	0	19	0	0	21	23	39	0	0	0	0	0
	Maginot St at Speers Rd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	25	0	0	0	0	25	0	14	15	0
	15%	0	0	24	0	0	0	0	24	0	13	14	0
	20%	0	0	22	0	0	0	0	22	0	12	13	0
	30%	0	0	19	0	0	0	0	19	0	11	12	0

AM Peak - 2025 Background Growth + Site Generated

	Marion St at Archibald St														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	871	826	116	98	271	89	0	842	292	0	1004	110	4519	
	15%	822	780	110	92	256	84	0	795	276	0	948	104	4268	-5.56%
	20%	774	734	103	87	241	79	0	748	260	0	892	98	4017	-11.1%
	30%	677	643	91	76	211	69	0	655	227	0	781	86	3514	-22.22%
	Marion St at Nicolas Ave														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	0	0	0	7	0	8	34	1162	0	0	1254	24	2488	
	15%	0	0	0	6	0	7	32	1098	0	0	1185	23	2350	-5.56%
	20%	0	0	0	6	0	7	30	1033	0	0	1115	21	2212	-11.1%
	30%	0	0	0	5	0	6	26	904	0	0	976	19	1935	-22.22%
	Marion St at Dupuy Ave														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	95	0	61	12	0	12	16	998	116	71	1187	17	2585	
	15%	90	0	58	11	0	11	15	942	110	67	1121	16	2441	-5.56%
	20%	84	0	54	11	0	11	14	887	103	63	1055	15	2298	-11.1%
	30%	74	0	47	9	0	9	13	776	90	55	923	14	2010	-22.22%
	Marion St at Panet St														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	0	0	0	0	0	159	253	831	0	0	1300	1	2545	
	15%	0	0	0	0	0	150	239	785	0	0	1228	1	2404	-5.56%
	20%	0	0	0	0	0	141	225	739	0	0	1156	1	2262	-11.1%
	30%	0	0	0	0	0	123	197	647	0	0	1011	1	1979	-22.22%
	Marion St at Dawson Rd														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	242	247	5	8	96	1	8	633	190	1	1058	108	2597	
	15%	229	233	5	7	90	1	7	598	180	1	1000	102	2453	-5.56%
	20%	215	219	5	7	85	1	7	563	169	1	941	96	2309	-11.1%
	30%	188	192	4	6	74	1	6	493	148	1	823	84	2020	-22.22%
	Dawson Rd at Panet St														
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**	**Total**	**% Change**
Analysis Case	10%	45	209	0	34	102	21	5	70	55	1	321	40	902	
	15%	42	197	0	32	97	20	5	66	52	1	303	38	852	-5.56%
	20%	40	186	0	30	91	18	5	62	49	1	285	36	802	-11.1%
	30%	35	162	0	26	79	16	4	54	43	1	249	31	702	-22.22%
	Marion St at Lagimodiere Blvd														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	594	1517	0	0	1484	674	581	0	98	0	0	0	4948	
	15%	561	1433	0	0	1401	637	549	0	93	0	0	0	4673	-5.56%
	20%	528	1349	0	0	1319	599	516	0	87	0	0	0	4398	-11.1%
	30%	462	1180	0	0	1154	524	452	0	76	0	0	0	3849	-22.22%
	Lagimodiere Blvd at Maginot St														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	59	2074	37	84	1266	226	341	26	22	33	2	73	4242	
	15%	55	1959	35	79	1196	213	322	25	21	31	2	69	4006	-5.56%
	20%	52	1844	33	74	1125	201	303	23	19	29	2	65	3771	-11.1%
	30%	46	1613	29	65	985	176	265	20	17	25	2	57	3299	-22.22%
	Maginot St at Speers Rd														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	4	17	189	36	5	9	23	159	9	89	98	95	732	
	15%	4	16	179	34	5	8	22	150	8	84	92	89	692	-5.56%
	20%	4	15	168	32	5	8	20	141	8	79	87	84	651	-11.1%
	30%	3	14	147	28	4	7	18	123	7	69	76	74	570	-22.22%

PM Peak - 2025 Background Growth

Growth Factor 1.087

	Marion St at Archibald St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	332	436	70	82	858	93	0	1076	851	0	921	108
	15%	313	412	66	77	810	88	0	1016	804	0	870	102
	20%	295	387	62	72	762	83	0	957	757	0	818	96
	30%	258	339	54	63	667	73	0	837	662	0	716	84
	Marion St at Nicolas Ave											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	15	0	23	8	1325	0	0	1050	5
	15%	0	0	0	14	0	22	7	1251	0	0	992	5
	20%	0	0	0	14	0	20	7	1178	0	0	933	5
	30%	0	0	0	12	0	18	6	1031	0	0	817	4
	Marion St at Dupuy Ave											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	13	0	10	5	1386	0	0	1099	10
	15%	0	0	0	12	0	9	5	1309	0	0	1038	9
	20%	0	0	0	12	0	9	5	1232	0	0	977	9
	30%	0	0	0	10	0	8	4	1078	0	0	855	8
	Marion St at Panet St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	235	260	1137	0	0	747	0
	15%	0	0	0	0	0	222	245	1074	0	0	705	0
	20%	0	0	0	0	0	209	231	1011	0	0	664	0
	30%	0	0	0	0	0	183	202	884	0	0	581	0
	Marion St at Dawson Rd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	150	93	28	62	190	0	3	897	237	3	597	30
	15%	142	88	27	59	180	0	3	847	224	3	564	29
	20%	133	83	25	55	169	0	3	797	211	3	530	27
	30%	117	73	22	48	148	0	3	697	184	3	464	24
	Dawson Rd at Panet St											
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
Analysis Case	10%	25	235	0	47	188	17	24	207	47	0	92	35
	15%	24	222	0	44	178	16	23	195	44	0	87	33
	20%	22	209	0	42	167	15	21	184	42	0	82	31
	30%	19	183	0	36	146	14	19	161	36	0	72	27
	Marion St at Lagimodiere Blvd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	112	1328	0	0	1975	441	723	0	305	0	0	0
	15%	106	1255	0	0	1865	417	683	0	288	0	0	0
	20%	100	1181	0	0	1756	392	643	0	272	0	0	0
	30%	87	1033	0	0	1536	343	562	0	238	0	0	0
	Lagimodiere Blvd at Maginot St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	53	1175	11	15	2457	234	202	3	59	24	1	46
	15%	50	1110	10	14	2320	221	191	3	55	23	1	43
	20%	47	1044	10	14	2184	208	180	3	52	21	1	41
	30%	41	914	8	12	1911	182	157	3	46	19	1	36
	Maginot St at Speers Rd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	7	11	99	55	17	16	4	125	16	88	164	21
	15%	6	10	93	52	16	15	4	118	15	83	155	20
	20%	6	10	88	49	15	14	4	111	14	78	146	18
	30%	5	8	77	43	14	13	3	97	13	68	128	16

PM Peak - 2025 Site Generated

Base Case

Marion St at Archibald St												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	36	15	0	0	0	96	0	0	73	64
15%	0	0	34	14	0	0	0	91	0	0	69	60
20%	0	0	32	13	0	0	0	85	0	0	65	57
30%	0	0	28	12	0	0	0	75	0	0	57	50
Marion St at Nicolas Ave												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	0	1	0	0	0	147	0	0	137	1
15%	0	0	0	1	0	0	0	139	0	0	129	1
20%	0	0	0	1	0	0	0	131	0	0	122	1
30%	0	0	0	1	0	0	0	114	0	0	107	1
Marion St at Dupuy Ave												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	143	0	121	0	1	0	1	28	143	110	-14	0
15%	135	0	114	0	1	0	1	26	135	104	-13	0
20%	127	0	108	0	1	0	1	25	127	98	-12	0
30%	111	0	94	0	1	0	1	22	111	86	-11	0
Marion St at Panet St												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	0	0	0	2	2	210	0	0	106	0
15%	0	0	0	0	0	2	2	198	0	0	100	0
20%	0	0	0	0	0	2	2	187	0	0	94	0
30%	0	0	0	0	0	2	2	163	0	0	82	0
Marion St at Dawson Rd												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	2	0	0	0	0	0	0	161	48	0	104	0
15%	2	0	0	0	0	0	0	152	45	0	98	0
20%	2	0	0	0	0	0	0	143	43	0	92	0
30%	2	0	0	0	0	0	0	125	37	0	81	0
Dawson Rd at Panet St												
Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
10%	1	1	0	0	1	0	0	0	1	0	0	0
15%	1	1	0	0	1	0	0	0	1	0	0	0
20%	1	1	0	0	1	0	0	0	1	0	0	0
30%	1	1	0	0	1	0	0	0	1	0	0	0
Marion St at Lagimodiere Blvd												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	71	0	0	0	0	33	69	0	92	0	0	0
15%	67	0	0	0	0	31	65	0	87	0	0	0
20%	63	0	0	0	0	29	61	0	82	0	0	0
30%	55	0	0	0	0	26	54	0	72	0	0	0
Lagimodiere Blvd at Maginot St												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	27	0	0	66	74	46	0	0	0	0	0
15%	0	26	0	0	62	70	43	0	0	0	0	0
20%	0	24	0	0	59	66	41	0	0	0	0	0
30%	0	21	0	0	51	58	36	0	0	0	0	0
Maginot St at Speers Rd												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	23	0	0	0	0	23	0	37	37	0
15%	0	0	22	0	0	0	0	22	0	35	35	0
20%	0	0	20	0	0	0	0	20	0	33	33	0
30%	0	0	18	0	0	0	0	18	0	29	29	0

PM Peak - 2025 Background Growth + Site Generated

	Marion St at Archibald St													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Base Case	10%	332	436	106	97	858	93	0	1172	851	0	994	172	5109	
	15%	313	412	100	91	810	88	0	1107	804	0	938	162	4825	-5.56%
	20%	295	387	94	86	762	83	0	1042	757	0	883	153	4541	-11.1%
	30%	258	339	82	75	667	73	0	912	662	0	773	133	3974	-22.22%
	Marion St at Nicolas Ave													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	0	0	0	16	0	23	8	1472	0	0	1187	6	2712	
	15%	0	0	0	15	0	22	7	1390	0	0	1121	6	2561	-5.56%
	20%	0	0	0	14	0	20	7	1308	0	0	1055	6	2411	-11.1%
	30%	0	0	0	13	0	18	6	1145	0	0	923	5	2109	-22.22%
	Marion St at Dupuy Ave													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	143	0	121	13	1	10	6	1414	143	110	1085	10	3056	
	15%	135	0	114	12	1	9	6	1335	135	104	1025	9	2886	-5.56%
	20%	127	0	108	12	1	9	6	1257	127	98	964	9	2716	-11.1%
	30%	111	0	94	10	1	8	5	1100	111	86	844	8	2377	-22.22%
	Marion St at Panet St													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	0	0	0	0	0	237	262	1347	0	0	853	0	2698	
	15%	0	0	0	0	0	224	247	1272	0	0	805	0	2548	-5.56%
	20%	0	0	0	0	0	210	233	1197	0	0	758	0	2399	-11.1%
	30%	0	0	0	0	0	184	204	1048	0	0	663	0	2099	-22.22%
	Marion St at Dawson Rd													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	152	93	28	62	190	0	3	1058	285	3	701	30	2606	
	15%	144	88	27	59	180	0	3	999	269	3	662	29	2462	-5.56%
	20%	135	83	25	55	169	0	3	940	253	3	623	27	2317	-11.1%
	30%	118	73	22	48	148	0	3	823	222	3	545	24	2027	-22.22%
	Dawson Rd at Panet St													
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**	**Total**	**% Change**
	10%	26	236	0	47	189	17	24	207	48	0	92	35	920	
	15%	25	223	0	44	179	16	23	195	45	0	87	33	869	-5.56%
	20%	23	210	0	42	168	15	21	184	42	0	82	31	818	-11.1%
	30%	20	183	0	36	147	14	19	161	37	0	72	27	716	-22.22%
	Marion St at Lagimodiere Blvd													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	183	1328	0	0	1975	474	792	0	397	0	0	0	5150	
	15%	173	1255	0	0	1865	448	748	0	375	0	0	0	4864	-5.56%
	20%	163	1181	0	0	1756	422	704	0	353	0	0	0	4578	-11.1%
	30%	142	1033	0	0	1536	369	616	0	309	0	0	0	4006	-22.22%
	Lagimodiere Blvd at Maginot St													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	53	1202	11	15	2523	308	248	3	59	24	1	46	4493	
	15%	50	1135	10	14	2382	291	234	3	55	23	1	43	4243	-5.56%
	20%	47	1068	10	14	2242	274	221	3	52	21	1	41	3993	-11.1%
	30%	41	935	8	12	1962	239	193	3	46	19	1	36	3494	-22.22%
	Maginot St at Speers Rd													
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
	10%	7	11	122	55	17	16	4	148	16	125	201	21	744	
	15%	6	10	115	52	16	15	4	140	15	118	190	20	703	-5.56%
	20%	6	10	108	49	15	14	4	132	14	111	179	18	661	-11.1%
	30%	5	8	95	43	14	13	3	115	13	97	156	16	579	-22.22%

AM Peak - 2030 Background Growth

Growth Factor 1.165

	Marion St at Archibald St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	933	886	72	77	290	96	0	851	313	0	990	94
	15%	882	836	68	73	274	90	0	803	296	0	935	89
	20%	830	787	64	68	258	85	0	756	279	0	880	84
	30%	726	689	56	60	226	74	0	662	244	0	770	73
	Marion St at Nicolas Ave												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	7	0	8	36	1114	0	0	1235	26
	15%	0	0	0	7	0	8	34	1052	0	0	1167	24
	20%	0	0	0	6	0	7	32	990	0	0	1098	23
	30%	0	0	0	5	0	6	28	866	0	0	961	20
	Marion St at Dupuy Ave												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	13	0	13	17	1066	0	0	1268	19
	15%	0	0	0	12	0	12	17	1007	0	0	1197	18
	20%	0	0	0	11	0	11	16	948	0	0	1127	17
	30%	0	0	0	10	0	10	14	829	0	0	986	15
	Marion St at Panet St												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	170	272	796	0	0	1251	1
	15%	0	0	0	0	0	161	256	752	0	0	1182	1
	20%	0	0	0	0	0	151	241	707	0	0	1112	1
	30%	0	0	0	0	0	132	211	619	0	0	973	1
	Marion St at Dawson Rd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	256	265	6	8	103	1	8	607	181	1	995	115
	15%	242	250	6	8	97	1	8	573	171	1	940	109
	20%	228	235	5	7	91	1	7	540	161	1	885	103
	30%	199	206	5	6	80	1	6	472	140	1	774	90
	Dawson Rd at Panet St												
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
Analysis Case	10%	48	224	0	36	110	22	6	75	59	1	344	43
	15%	45	211	0	34	103	21	6	70	56	1	325	41
	20%	42	199	0	32	97	20	5	66	53	1	306	38
	30%	37	174	0	28	85	17	5	58	46	1	267	34
	Marion St at Lagimodiere Blvd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	560	1627	0	0	1591	660	587	0	69	0	0	0
	15%	529	1536	0	0	1502	623	555	0	65	0	0	0
	20%	498	1446	0	0	1414	586	522	0	61	0	0	0
	30%	436	1265	0	0	1237	513	457	0	53	0	0	0
	Lagimodiere Blvd at Maginot St												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	63	2198	40	90	1328	211	312	28	23	35	2	78
	15%	59	2076	37	85	1255	199	295	26	22	33	2	74
	20%	56	1953	35	80	1181	187	278	25	21	31	2	69
	30%	49	1709	31	70	1033	164	243	22	18	27	2	61
	Maginot St at Speers Rd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	5	19	176	38	6	9	24	143	9	80	89	101
	15%	4	18	166	36	6	9	23	135	9	76	84	96
	20%	4	17	156	34	5	8	22	127	8	71	79	90
	30%	4	15	137	30	5	7	19	111	7	63	69	79

AM Peak - 2030 Site Generated

	Marion St at Archibald St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	170	88	0	0	0	154	0	0	228	63
	15%	0	0	161	83	0	0	0	145	0	0	215	60
	20%	0	0	151	78	0	0	0	137	0	0	203	56
	30%	0	0	132	68	0	0	0	120	0	0	177	49
	Marion St at Nicolas Ave											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	1	0	413	0	0	292	1
	15%	0	0	0	0	0	1	0	390	0	0	276	1
	20%	0	0	0	0	0	1	0	367	0	0	260	1
	30%	0	0	0	0	0	1	0	321	0	0	227	1
	Marion St at Dupuy Ave											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	278	1	73	0	2	0	0	4	404	94	9	0
	15%	263	1	69	0	2	0	0	4	382	89	9	0
	20%	247	1	65	0	2	0	0	4	359	84	8	0
	30%	216	1	57	0	2	0	0	3	314	73	7	0
	Marion St at Panet St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	4	2	136	0	0	214	0
	15%	0	0	0	0	0	4	2	128	0	0	202	0
	20%	0	0	0	0	0	4	2	121	0	0	190	0
	30%	0	0	0	0	0	3	2	106	0	0	166	0
	Marion St at Dawson Rd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	2	0	0	0	0	0	0	118	18	0	212	0
	15%	2	0	0	0	0	0	0	111	17	0	200	0
	20%	2	0	0	0	0	0	0	105	16	0	188	0
	30%	2	0	0	0	0	0	0	92	14	0	165	0
	Dawson Rd at Panet St											
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
Analysis Case	10%	1	1	0	0	2	0	0	0	2	0	0	0
	15%	1	1	0	0	2	0	0	0	2	0	0	0
	20%	1	1	0	0	2	0	0	0	2	0	0	0
	30%	1	1	0	0	2	0	0	0	2	0	0	0
	Marion St at Lagimodiere Blvd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	40	3	0	0	25	171	84	0	34	0	0	0
	15%	38	3	0	0	24	162	79	0	32	0	0	0
	20%	36	3	0	0	22	152	75	0	30	0	0	0
	30%	31	2	0	0	19	133	65	0	26	0	0	0
	Lagimodiere Blvd at Maginot St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	46	34	0	0	37	40	10	0	36	0	0	0
	15%	43	32	0	0	35	38	9	0	34	0	0	0
	20%	41	30	0	0	33	36	9	0	32	0	0	0
	30%	36	26	0	0	29	31	8	0	28	0	0	0
	Maginot St at Speers Rd											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	80	4	38	32	34	82	3	0	8	7	71
	15%	0	76	4	36	30	32	77	3	0	8	7	67
	20%	0	71	4	34	28	30	73	3	0	7	6	63
	30%	0	62	3	30	25	26	64	2	0	6	5	55

AM Peak - 2030 Background Growth + Site Generated

	Marion St at Archibald St														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	933	886	242	165	290	96	0	1005	313	0	1218	157	5306	
	15%	882	836	229	156	274	90	0	949	296	0	1151	149	5011	-5.56%
	20%	830	787	215	147	258	85	0	893	279	0	1083	140	4716	-11.1%
	30%	726	689	188	128	226	74	0	781	244	0	948	122	4127	-22.22%
	Marion St at Nicolas Ave														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	0	0	0	7	0	9	36	1527	0	0	1527	27	3133	
	15%	0	0	0	7	0	9	34	1442	0	0	1442	25	2959	-5.56%
	20%	0	0	0	6	0	8	32	1357	0	0	1357	24	2785	-11.1%
	30%	0	0	0	5	0	7	28	1188	0	0	1188	21	2437	-22.22%
	Marion St at Dupuy Ave														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	278	1	73	13	2	13	17	1070	404	94	1277	19	3261	
	15%	263	1	69	12	2	12	17	1011	382	89	1206	18	3080	-5.56%
	20%	247	1	65	11	2	11	16	951	359	84	1135	17	2898	-11.1%
	30%	216	1	57	10	2	10	14	832	314	73	993	15	2536	-22.22%
	Marion St at Panet St														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	0	0	0	0	0	174	274	932	0	0	1465	1	2846	
	15%	0	0	0	0	0	164	258	880	0	0	1384	1	2688	-5.56%
	20%	0	0	0	0	0	155	243	828	0	0	1303	1	2530	-11.1%
	30%	0	0	0	0	0	135	213	725	0	0	1140	1	2214	-22.22%
	Marion St at Dawson Rd														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	258	265	6	8	103	1	8	725	199	1	1207	115	2896	
	15%	244	250	6	8	97	1	8	685	188	1	1140	109	2735	-5.56%
	20%	230	235	5	7	91	1	7	645	177	1	1073	103	2574	-11.1%
	30%	201	206	5	6	80	1	6	564	154	1	939	90	2252	-22.22%
	Dawson Rd at Panet St														
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**	**Total**	**% Change**
Analysis Case	10%	49	225	0	36	112	22	6	75	61	1	344	43	973	
	15%	46	212	0	34	105	21	6	70	58	1	325	41	919	-5.56%
	20%	43	200	0	32	99	20	5	66	55	1	306	38	865	-11.1%
	30%	38	175	0	28	87	17	5	58	48	1	267	34	757	-22.22%
	Marion St at Lagimodiere Blvd														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	600	1630	0	0	1616	831	671	0	103	0	0	0	5450	
	15%	567	1539	0	0	1526	784	634	0	97	0	0	0	5147	-5.56%
	20%	534	1449	0	0	1436	738	597	0	91	0	0	0	4845	-11.1%
	30%	467	1268	0	0	1257	646	522	0	80	0	0	0	4239	-22.22%
	Lagimodiere Blvd at Maginot St														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	109	2232	40	90	1365	251	322	28	59	35	2	78	4611	
	15%	103	2108	37	85	1290	237	304	26	56	33	2	74	4355	-5.56%
	20%	97	1984	35	80	1214	223	286	25	53	31	2	69	4099	-11.1%
	30%	85	1736	31	70	1062	195	251	22	46	27	2	61	3586	-22.22%
	Maginot St at Speers Rd														
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
Analysis Case	10%	5	99	180	76	38	43	106	146	9	88	96	172	1059	
	15%	4	93	170	72	36	41	101	138	9	83	90	163	1000	-5.56%
	20%	4	88	160	68	34	39	95	130	8	79	85	153	942	-11.1%
	30%	4	77	140	59	29	34	83	114	7	69	74	134	824	-22.22%

PM Peak - 2030 Background Growth

Growth Factor 1.165

	Marion St at Archibald St											
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	355	467	75	87	919	100	0	1154	912	0	987	115
	15%	336	441	70	83	868	95	0	1090	862	0	932	109
	20%	316	415	66	78	817	89	0	1025	811	0	877	103
	30%	276	363	58	68	715	78	0	897	710	0	768	90
	Marion St at Nicolas Ave												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	16	0	24	8	1420	0	0	1126	6
	15%	0	0	0	15	0	23	8	1342	0	0	1063	6
	20%	0	0	0	15	0	22	7	1263	0	0	1001	5
	30%	0	0	0	13	0	19	6	1105	0	0	875	5
	Marion St at Dupuy Ave												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	14	0	10	6	1486	0	0	1178	10
	15%	0	0	0	13	0	10	6	1403	0	0	1113	10
	20%	0	0	0	12	0	9	5	1321	0	0	1047	9
	30%	0	0	0	11	0	8	5	1156	0	0	916	8
	Marion St at Panet St												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	0	0	0	0	0	252	278	1219	0	0	801	0
	15%	0	0	0	0	0	238	263	1151	0	0	756	0
	20%	0	0	0	0	0	224	248	1083	0	0	712	0
	30%	0	0	0	0	0	196	217	948	0	0	623	0
	Marion St at Dawson Rd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	161	100	30	66	204	0	3	961	254	3	640	33
	15%	152	95	29	63	193	0	3	908	240	3	604	31
	20%	143	89	27	59	181	0	3	855	226	3	569	29
	30%	125	78	24	52	159	0	3	748	198	3	498	25
	Dawson Rd at Panet St												
	Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
Analysis Case	10%	27	252	0	50	202	19	26	221	50	0	99	37
	15%	25	238	0	47	190	18	24	209	47	0	94	35
	20%	24	224	0	45	179	17	23	197	45	0	88	33
	30%	21	196	0	39	157	15	20	172	39	0	77	29
	Marion St at Lagimodiere Blvd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	120	1424	0	0	2117	473	775	0	327	0	0	0
	15%	113	1345	0	0	2000	447	732	0	309	0	0	0
	20%	107	1266	0	0	1882	421	689	0	291	0	0	0
	30%	93	1108	0	0	1647	368	603	0	255	0	0	0
	Lagimodiere Blvd at Maginot St												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	57	1260	12	16	2633	251	217	3	63	26	1	49
	15%	54	1190	11	15	2487	237	205	3	59	24	1	46
	20%	51	1120	10	15	2341	223	193	3	56	23	1	44
	30%	44	980	9	13	2048	195	169	3	49	20	1	38
	Maginot St at Speers Rd												
	Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Analysis Case	10%	7	12	106	59	19	17	5	134	17	94	176	22
	15%	7	11	100	56	18	17	4	127	17	89	166	21
	20%	6	10	94	53	17	16	4	119	16	84	156	20
	30%	5	9	82	46	15	14	4	104	14	73	137	17

PM Peak - 2030 Site Generated

Base Case

Marion St at Archibald St												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	98	42	0	0	0	270	0	0	204	173
15%	0	0	93	40	0	0	0	255	0	0	193	163
20%	0	0	87	37	0	0	0	240	0	0	181	154
30%	0	0	76	33	0	0	0	210	0	0	159	135
Marion St at Nicolas Ave												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	0	2	0	0	0	410	0	0	380	2
15%	0	0	0	2	0	0	0	387	0	0	359	2
20%	0	0	0	2	0	0	0	364	0	0	338	2
30%	0	0	0	2	0	0	0	319	0	0	296	2
Marion St at Dupuy Ave												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	385	2	152	0	2	0	1	32	405	111	-18	0
15%	364	2	144	0	2	0	1	30	383	105	-17	0
20%	342	2	135	0	2	0	1	28	360	99	-16	0
30%	299	2	118	0	2	0	1	25	315	86	-14	0
Marion St at Panet St												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	0	0	0	0	4	5	288	0	0	130	0
15%	0	0	0	0	0	4	5	272	0	0	123	0
20%	0	0	0	0	0	4	4	256	0	0	116	0
30%	0	0	0	0	0	3	4	224	0	0	101	0
Marion St at Dawson Rd												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	3	0	0	0	0	0	1	254	34	0	127	0
15%	3	0	0	0	0	0	1	240	32	0	120	0
20%	3	0	0	0	0	0	1	226	30	0	113	0
30%	2	0	0	0	0	0	1	198	26	0	99	0
Dawson Rd at Panet St												
Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**
10%	3	3	0	0	2	0	0	0	2	0	0	0
15%	3	3	0	0	2	0	0	0	2	0	0	0
20%	3	3	0	0	2	0	0	0	2	0	0	0
30%	2	2	0	0	2	0	0	0	2	0	0	0
Marion St at Lagimodiere Blvd												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	40	19	0	0	2	87	175	0	77	0	0	0
15%	38	18	0	0	2	82	165	0	73	0	0	0
20%	36	17	0	0	2	77	156	0	68	0	0	0
30%	31	15	0	0	2	68	136	0	60	0	0	0
Lagimodiere Blvd at Maginot St												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	37	30	0	0	78	36	31	0	91	0	0	0
15%	35	28	0	0	74	34	29	0	86	0	0	0
20%	33	27	0	0	69	32	28	0	81	0	0	0
30%	29	23	0	0	61	28	24	0	71	0	0	0
Maginot St at Speers Rd												
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
10%	0	61	7	110	88	88	62	6	0	17	17	39
15%	0	58	7	104	83	83	59	6	0	16	16	37
20%	0	54	6	98	78	78	55	5	0	15	15	35
30%	0	47	5	86	68	68	48	5	0	13	13	30

PM Peak - 2030 Background Growth + Site Generated

Base Case

Marion St at Archibald St														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	355	467	173	129	919	100	0	1424	912	0	1191	288	5960	
15%	336	441	163	122	868	95	0	1345	862	0	1125	272	5628	-5.56%
20%	316	415	153	115	817	89	0	1265	811	0	1059	256	5297	-11.1%
30%	276	363	134	101	715	78	0	1107	710	0	926	224	4635	-22.22%
Marion St at Nicolas Ave														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	0	0	0	18	0	24	8	1830	0	0	1506	8	3395	
15%	0	0	0	17	0	23	8	1729	0	0	1422	7	3206	-5.56%
20%	0	0	0	16	0	22	7	1627	0	0	1338	7	3018	-11.1%
30%	0	0	0	14	0	19	6	1424	0	0	1171	6	2640	-22.22%
Marion St at Dupuy Ave														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	385	2	152	14	2	10	7	1518	405	111	1160	10	3777	
15%	364	2	144	13	2	10	6	1433	383	105	1096	10	3567	-5.56%
20%	342	2	135	12	2	9	6	1349	360	99	1031	9	3357	-11.1%
30%	299	2	118	11	2	8	5	1180	315	86	902	8	2937	-22.22%
Marion St at Panet St														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	0	0	0	0	0	256	283	1507	0	0	931	0	2977	
15%	0	0	0	0	0	241	268	1423	0	0	879	0	2811	-5.56%
20%	0	0	0	0	0	227	252	1339	0	0	827	0	2646	-11.1%
30%	0	0	0	0	0	199	220	1172	0	0	724	0	2315	-22.22%
Marion St at Dawson Rd														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	164	100	30	66	204	0	4	1215	288	3	767	33	2875	
15%	155	95	29	63	193	0	4	1148	272	3	724	31	2716	-5.56%
20%	146	89	27	59	181	0	4	1080	256	3	682	29	2556	-11.1%
30%	127	78	24	52	159	0	3	945	224	3	596	25	2236	-22.22%
Dawson Rd at Panet St														
Mode Share	**NEBL**	**NEBT**	**NEBR**	**SWBL**	**SWBT**	**SWBR**	**SEBL**	**SEBT**	**SEBR**	**NWBL**	**NWBT**	**NWBR**	**Total**	**% Change**
10%	30	255	0	50	204	19	26	221	52	0	99	37	992	
15%	28	241	0	47	192	18	24	209	49	0	94	35	937	-5.56%
20%	26	226	0	45	181	17	23	197	46	0	88	33	882	-11.1%
30%	23	198	0	39	158	15	20	172	41	0	77	29	772	-22.22%
Marion St at Lagimodiere Blvd														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	160	1443	0	0	2119	560	950	0	404	0	0	0	5637	
15%	151	1363	0	0	2002	529	897	0	382	0	0	0	5323	-5.56%
20%	142	1283	0	0	1884	498	844	0	359	0	0	0	5010	-11.1%
30%	124	1122	0	0	1648	436	739	0	315	0	0	0	4384	-22.22%
Lagimodiere Blvd at Maginot St														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	94	1290	12	16	2711	287	248	3	154	26	1	49	4891	
15%	89	1218	11	15	2561	271	234	3	145	24	1	46	4619	-5.56%
20%	84	1146	10	15	2410	255	220	3	137	23	1	44	4347	-11.1%
30%	73	1003	9	13	2109	223	193	3	120	20	1	38	3804	-22.22%
Maginot St at Speers Rd														
Mode Share	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**% Change**
10%	7	73	113	169	107	105	67	140	17	111	193	61	1164	
15%	7	69	107	160	101	100	63	132	17	105	182	58	1099	-5.56%
20%	6	65	100	151	95	94	59	124	16	99	172	54	1035	-11.1%
30%	5	57	88	132	83	82	52	109	14	87	150	48	905	-22.22%

APPENDIX D

PTV Vistro Reports

Vistro File: V:\...\20190722_Market_Lands_Updated_Traffic_Counts.vistro

Scenario 1 AM Peak 2019

Report File: V:\...\2019 BG - AM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	EB Right	0.790	47.8	D
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.752	29.2	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.250	9.3	A
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.152	105.4	F
13	Marion & Dupuy	Two-way stop	HCM 6th Edition	SB Left	0.248	95.9	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.348	17.2	C
15	Marion & Dawson	Signalized	HCM 6th Edition	NWB Thru	0.711	26.5	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NWB Thru	0.342	16.2	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	0.833	58.6	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Generated with PTV VISTRO

Version 7.00-03

Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	47.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.790

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	481	1396	1365	566	504	59
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	131	379	371	154	137	16
Total Analysis Volume [veh/h]	523	1517	1484	615	548	64
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	45	108	63	32	32	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	19	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	102	102	59	91	26	26
g / C, Green / Cycle	0.73	0.73	0.42	0.65	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.56	0.43	0.43	0.39	0.19	0.19
s, saturation flow rate [veh/h]	934	3503	3418	1589	1709	1483
c, Capacity [veh/h]	607	2552	1444	1035	317	275
d1, Uniform Delay [s]	41.19	9.10	40.42	13.90	57.00	57.00
k, delay calibration	0.50	0.50	0.50	0.50	0.33	0.34
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	14.87	1.03	31.05	2.52	49.57	53.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.59	1.03	0.59	1.03	1.03
d, Delay for Lane Group [s/veh]	56.06	10.12	71.48	16.42	106.57	110.17
Lane Group LOS	E	B	F	B	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.51	9.43	29.58	10.54	15.57	13.79
50th-Percentile Queue Length [m/ln]	57.22	71.85	225.38	80.33	118.68	105.08
95th-Percentile Queue Length [veh/ln]	12.00	14.47	39.31	15.87	22.41	20.22
95th-Percentile Queue Length [m/ln]	91.47	110.22	299.53	120.90	170.79	154.10

Movement, Approach, & Intersection Results

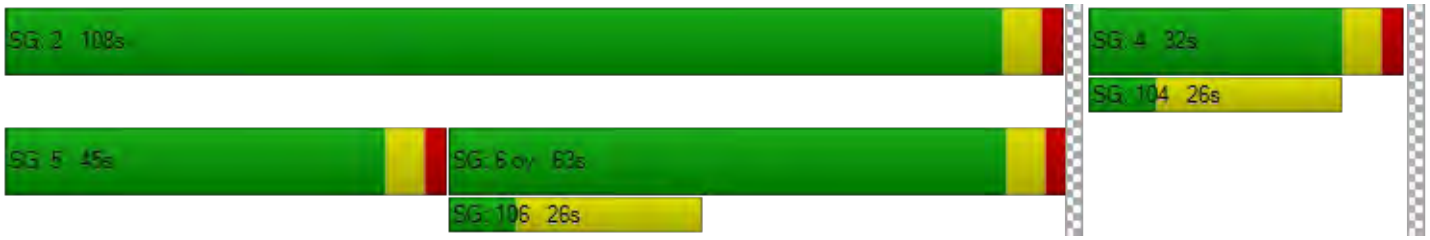
d_M, Delay for Movement [s/veh]	56.06	10.12	71.48	16.42	108.04	110.17
Movement LOS	E	B	F	B	F	F
d_A, Approach Delay [s/veh]	21.90		55.35		108.25	
Approach LOS	C		E		F	
d_I, Intersection Delay [s/veh]	47.80					
Intersection LOS	D					
Intersection V/C	0.790					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	0.00	59.43
l_p,int, Pedestrian LOS Score for Intersection	4.187	0.000	3.188
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	70.00	70.00	70.00
l_b,int, Bicycle LOS Score for Intersection	5.815	5.864	5.142
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	29.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	2.00	3.00	1.00	6.00	8.00	6.00	4.00	47.00	1.00	1.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	513	9	21	310	49	73	7	5	8	1	18
Total Analysis Volume [veh/h]	59	2050	37	84	1239	197	291	26	22	33	2	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	13	84	15	18	89	0	23	23	0	15	15	18
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	7	89	98	8	90	90	14	15	15	25	5	19
g / C, Green / Cycle	0.05	0.63	0.70	0.06	0.65	0.65	0.10	0.11	0.11	0.18	0.03	0.14
(v / s)_i Volume / Saturation Flow Rate	0.04	0.58	0.02	0.05	0.36	0.13	0.09	0.01	0.01	0.02	0.00	0.05
s, saturation flow rate [veh/h]	1509	3560	1577	1795	3446	1513	3348	1840	1573	1499	1885	1577
c, Capacity [veh/h]	72	2255	1108	106	2222	975	341	202	173	328	65	215
d1, Uniform Delay [s]	66.06	22.19	6.34	65.00	13.79	10.16	61.85	56.26	56.31	48.08	65.36	54.75
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	19.71	6.85	0.06	12.21	1.02	0.47	6.09	0.27	0.34	0.13	0.19	0.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.91	0.03	0.79	0.56	0.20	0.85	0.12	0.13	0.10	0.03	0.34
d, Delay for Lane Group [s/veh]	85.78	29.04	6.40	77.20	14.81	10.62	67.94	56.53	56.65	48.22	65.55	55.68
Lane Group LOS	F	C	A	E	B	B	E	E	E	D	E	E
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.44	27.42	0.31	3.25	10.01	2.40	5.39	0.82	0.75	0.99	0.07	2.40
50th-Percentile Queue Length [m/ln]	18.56	208.97	2.38	24.78	76.25	18.26	41.05	6.27	5.73	7.52	0.55	18.31
95th-Percentile Queue Length [veh/ln]	4.39	36.01	0.56	5.85	15.19	4.31	9.19	1.48	1.35	1.78	0.13	4.33
95th-Percentile Queue Length [m/ln]	33.41	274.41	4.28	44.60	115.78	32.87	70.06	11.28	10.32	13.54	1.00	32.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	85.78	29.04	6.40	77.20	14.81	10.62	67.94	56.53	56.65	48.22	65.55	55.68
Movement LOS	F	C	A	E	B	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	30.21			17.71			66.33			53.58		
Approach LOS	C			B			E			D		
d_I, Intersection Delay [s/veh]	29.18											
Intersection LOS	C											
Intersection V/C	0.752											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	59.43	59.43	59.43
l_p,int, Pedestrian LOS Score for Intersection	3.970	3.931	2.763	2.404
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1114	1186	243	129
d_b, Bicycle Delay [s]	13.73	11.60	54.03	61.29
l_b,int, Bicycle LOS Score for Intersection	3.330	2.814	1.839	1.738
Bicycle LOS	C	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.250

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	6.00	1.00	15.00	1.00	13.00	1.00	6.00	1.00	1.00	8.00	6.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	4	42	9	1	2	6	34	2	19	21	24
Total Analysis Volume [veh/h]	4	18	168	37	6	9	23	137	9	77	84	97
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	797	658	718	644	770
Degree of Utilization, x	0.24	0.08	0.24	0.25	0.13

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.93	0.26	0.91	0.99	0.43
95th-Percentile Queue Length [m]	7.07	1.95	6.94	7.51	3.28
Approach Delay [s/veh]	8.93	8.94	9.55	9.36	
Approach LOS	A	A	A	A	
Intersection Delay [s/veh]	9.25				
Intersection LOS	A				

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	105.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.152

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	7	31	956	1060	22
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	8	252	279	6
Total Analysis Volume [veh/h]	6	7	33	1006	1116	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.01	0.05	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	105.43	21.78	11.19	0.00	0.00	0.00
Movement LOS	F	C	B	A	A	A
95th-Percentile Queue Length [veh/ln]	0.56	0.56	0.17	0.08	0.00	0.00
95th-Percentile Queue Length [m/ln]	4.29	4.29	1.29	0.65	0.00	0.00
d_A, Approach Delay [s/veh]	60.39		0.36		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	0.53					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Marion & Dupuy

Control Type:	Two-way stop	Delay (sec / veh):	95.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.248

Intersection Setup

Name	Dupuy Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Dupuy Ave		Marion St		Marion St	
Base Volume Input [veh/h]	11	11	15	915	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	55.00	82.00	27.00	3.00	4.00	50.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	11	15	915	1088	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	4	241	286	4
Total Analysis Volume [veh/h]	12	12	16	963	1145	17
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.25	0.04	0.03	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	95.93	33.51	12.88	0.00	0.00	0.00
Movement LOS	F	D	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.06	1.06	0.10	0.05	0.00	0.00
95th-Percentile Queue Length [m/ln]	8.08	8.08	0.80	0.40	0.00	0.00
d_A, Approach Delay [s/veh]	64.72		0.21		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	0.81					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.348

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	4.00	4.00	2.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	233	683	1074	1	0	146
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	184	289	0	0	39
Total Analysis Volume [veh/h]	251	734	1155	1	0	157
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.43	0.01	0.01	0.00	0.00	0.35
d_M, Delay for Movement [s/veh]	15.93	0.00	0.00	0.00	0.00	17.16
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	2.19	1.09	0.00	0.00	0.00	1.53
95th-Percentile Queue Length [m/ln]	16.67	8.33	0.00	0.00	0.00	11.70
d_A, Approach Delay [s/veh]	4.06		0.00		17.16	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.91					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Marion & Dawson

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.711

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	6.00	6.00	1.00	4.00	1.00	3.00	8.00	40.00	13.00	20.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	142	42	0	232	27	60	62	1	2	24	0
Total Analysis Volume [veh/h]	8	566	168	1	928	108	239	247	5	8	96	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			1			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	56.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	40	0	0	40	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	34	24	24	24
g / C, Green / Cycle	0.49	0.49	0.49	0.49	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.22	0.23	0.30	0.30	0.41	0.01	0.06
s, saturation flow rate [veh/h]	1785	1515	1839	1611	1197	1028	1597
c, Capacity [veh/h]	920	736	945	782	487	103	548
d1, Uniform Delay [s]	11.89	11.95	13.23	13.24	26.61	15.36	16.09
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.50	2.09	2.65	3.66	42.91	1.47	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.46	0.59	0.62	1.01	0.08	0.18
d, Delay for Lane Group [s/veh]	13.39	14.04	15.88	16.89	69.52	16.83	16.80
Lane Group LOS	B	B	B	B	F	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.88	3.42	6.06	5.49	13.67	0.12	1.10
50th-Percentile Queue Length [m/ln]	29.55	26.03	46.16	41.85	104.14	0.91	8.34
95th-Percentile Queue Length [veh/ln]	6.98	6.15	10.09	9.34	19.84	0.22	1.97
95th-Percentile Queue Length [m/ln]	53.19	46.85	76.91	71.14	151.17	1.64	15.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.39	13.59	14.04	15.88	16.29	16.89	69.52	69.52	69.52	16.83	16.80	16.80
Movement LOS	B	B	B	B	B	B	E	E	E	B	B	B
d_A, Approach Delay [s/veh]	13.69			16.35			69.52			16.80		
Approach LOS	B			B			E			B		
d_I, Intersection Delay [s/veh]	26.53											
Intersection LOS	C											
Intersection V/C	0.711											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.388	2.916	0.000	0.000
Crosswalk LOS	C	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	971	971	686	686
d_b, Bicycle Delay [s]	9.26	9.26	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	2.172	2.415	2.370	1.733
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.342

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	3.00	2.00	18.00	5.00	5.00	2.00	7.00	22.00	20.00	32.00	12.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Peak Hour Factor	0.9400	0.9400	1.0000	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	51	0	8	25	5	0	78	10	1	17	14
Total Analysis Volume [veh/h]	44	204	0	33	100	20	1	314	39	5	68	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	40	0	0	40	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	24	24	24
g / C, Green / Cycle	0.49	0.49	0.49	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.14	0.08	0.01	0.20	0.05	0.05
s, saturation flow rate [veh/h]	1755	1643	1551	1760	1390	1113
c, Capacity [veh/h]	913	862	753	655	532	382
d1, Uniform Delay [s]	10.69	9.98	9.38	18.92	15.87	15.96
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.73	0.38	0.07	3.18	0.49	0.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.15	0.03	0.54	0.13	0.16
d, Delay for Lane Group [s/veh]	11.42	10.37	9.44	22.10	16.37	16.83
Lane Group LOS	B	B	A	C	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.13	1.06	0.15	4.82	0.75	0.69
50th-Percentile Queue Length [m/ln]	16.22	8.11	1.15	36.70	5.75	5.25
95th-Percentile Queue Length [veh/ln]	3.83	1.92	0.27	8.42	1.36	1.24
95th-Percentile Queue Length [m/ln]	29.20	14.60	2.07	64.13	10.34	9.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.42	11.42	0.00	10.37	10.37	9.44	22.10	22.10	22.10	16.37	16.40	16.83
Movement LOS	B	B		B	B	A	C	C	C	B	B	B
d_A, Approach Delay [s/veh]	11.42			10.24			22.10			16.58		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	16.25											
Intersection LOS	B											
Intersection V/C	0.342											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	971	971	686	686
d_b, Bicycle Delay [s]	9.26	9.26	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	1.969	1.812	2.144	1.664
Bicycle LOS	A	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	58.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.833

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	9.00	4.00	5.00	1.00	3.00	2.00	1.00	3.00	11.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	209	198	16	17	65	21	1	190	70	1	221	21
Total Analysis Volume [veh/h]	834	792	65	69	259	85	2	760	280	3	885	84
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			8			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			8			8		
v_co, Outbound Pedestrian Volume crossing	0			0			8			1		
v_ci, Inbound Pedestrian Volume crossing mi	8			1			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	76.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	56	60	0	14	18	0	0	46	0	0	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	50	57	6	13	13	41	41	41	41
g / C, Green / Cycle	0.42	0.47	0.05	0.11	0.11	0.34	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.46	0.46	0.04	0.10	0.10	0.22	0.18	0.26	0.27
s, saturation flow rate [veh/h]	1795	1860	1681	1840	1688	3532	1589	1855	1800
c, Capacity [veh/h]	748	879	88	199	183	1207	543	634	615
d1, Uniform Delay [s]	35.00	30.95	56.18	52.78	52.94	33.13	31.56	35.20	35.58
k, delay calibration	0.50	0.44	0.11	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	69.18	23.14	13.93	12.42	15.87	2.50	3.47	8.53	9.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.11	0.97	0.78	0.89	0.91	0.63	0.52	0.76	0.79
d, Delay for Lane Group [s/veh]	104.18	54.09	70.11	65.20	68.81	35.63	35.04	43.73	45.44
Lane Group LOS	F	D	E	E	E	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	35.19	28.46	2.38	5.88	5.72	9.49	6.89	13.78	14.10
50th-Percentile Queue Length [m/ln]	268.12	216.86	18.16	44.80	43.58	72.30	52.50	105.04	107.44
95th-Percentile Queue Length [veh/ln]	48.57	37.21	4.29	9.86	9.64	14.54	11.19	19.87	20.26
95th-Percentile Queue Length [m/ln]	370.12	283.53	32.69	75.10	73.46	110.79	85.30	151.44	154.37

Movement, Approach, & Intersection Results

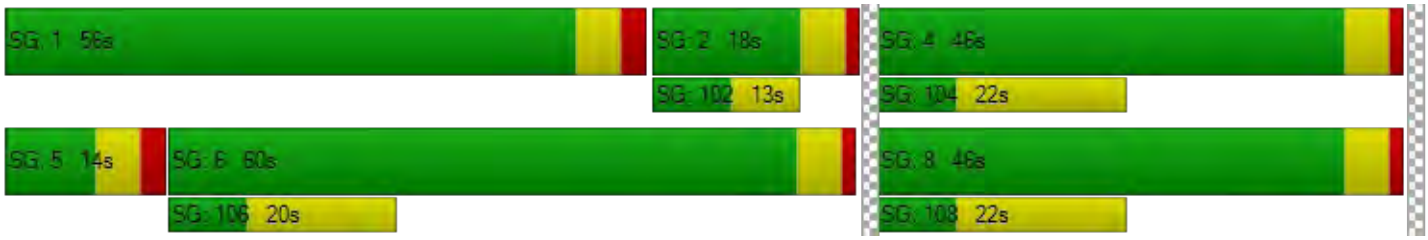
d_M, Delay for Movement [s/veh]	104.18	54.09	54.09	70.11	66.34	68.81	0.00	35.63	35.04	0.00	44.50	45.44
Movement LOS	F	D	D	E	E	E		D	D		D	D
d_A, Approach Delay [s/veh]	78.80			67.48			35.47			44.58		
Approach LOS	E			E			D			D		
d_I, Intersection Delay [s/veh]	58.65											
Intersection LOS	E											
Intersection V/C	0.833											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.050	2.750	3.233	2.933
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	917	217	683	683
d_b, Bicycle Delay [s]	17.60	47.70	26.00	26.00
l_b,int, Bicycle LOS Score for Intersection	4.350	1.900	2.418	2.359
Bicycle LOS	E	A	B	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 2 PM Peak 2019

Report File: V:\...\2019 BG - PM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.932	58.3	E
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.817	35.5	D
9	Maginot & Speers	Two-way stop	HCM 6th Edition	WB Left	0.156	15.5	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.191	61.1	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	SB Left	0.477	187.0	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.377	14.2	B
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Left	0.608	18.2	B
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.229	14.0	B
19	Archibald & Marion	Signalized	HCM 6th Edition	EB Right	0.973	73.5	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	58.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.932

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	3.00	2.00	2.00	1.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1222	1817	406	665	281
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	332	494	110	181	76
Total Analysis Volume [veh/h]	112	1328	1975	441	723	305
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	14	93	79	47	47	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	5	7	7	7	0
Pedestrian Clearance [s]	0	10	19	21	21	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	8	87	73	120	41	41
g / C, Green / Cycle	0.06	0.62	0.52	0.86	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.07	0.38	0.55	0.28	0.29	0.31
s, saturation flow rate [veh/h]	1652	3532	3560	1589	1795	1648
c, Capacity [veh/h]	94	2195	1857	1362	526	483
d1, Uniform Delay [s]	66.00	16.08	33.50	1.98	49.20	49.50
k, delay calibration	0.11	0.50	0.50	0.39	0.42	0.47
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	104.79	1.25	40.25	0.50	32.60	55.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.19	0.61	1.06	0.32	0.99	1.06
d, Delay for Lane Group [s/veh]	170.79	17.33	73.75	2.47	81.80	105.01
Lane Group LOS	F	B	F	A	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.04	12.02	39.15	1.27	22.65	24.21
50th-Percentile Queue Length [m/ln]	46.04	91.63	298.30	9.69	172.62	184.46
95th-Percentile Queue Length [veh/ln]	10.57	17.71	51.96	2.29	30.46	33.44
95th-Percentile Queue Length [m/ln]	80.51	134.96	395.97	17.44	232.10	254.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	170.79	17.33	73.75	2.47	88.43	105.01
Movement LOS	F	B	F	A	F	F
d_A, Approach Delay [s/veh]	29.26		60.74		93.31	
Approach LOS	C		E		F	
d_I, Intersection Delay [s/veh]	58.31					
Intersection LOS	E					
Intersection V/C	0.932					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	0.00	59.43
l_p,int, Pedestrian LOS Score for Intersection	4.255	0.000	2.794
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	70.00	70.00	70.00
l_b,int, Bicycle LOS Score for Intersection	5.320	6.126	5.829
Bicycle LOS	F	F	F

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	3.00	20.00	8.00	2.00	5.00	7.00	1.00	12.00	1.00	1.00	13.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	294	3	4	614	58	51	1	15	6	0	11
Total Analysis Volume [veh/h]	53	1175	11	15	2457	234	202	3	59	24	1	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	13	87	16	15	89	0	23	22	0	16	15	15
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	6	98	107	3	95	95	11	12	12	21	4	13
g / C, Green / Cycle	0.04	0.70	0.77	0.02	0.68	0.68	0.08	0.08	0.08	0.15	0.03	0.09
(v / s)_i Volume / Saturation Flow Rate	0.04	0.33	0.01	0.01	0.69	0.15	0.06	0.00	0.04	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1509	3532	1360	1695	3560	1551	3320	1885	1602	1501	1885	1449
c, Capacity [veh/h]	65	2480	1043	34	2418	1053	254	159	135	255	57	135
d1, Uniform Delay [s]	66.45	9.31	3.83	67.85	22.47	8.49	63.58	58.76	60.90	51.41	65.87	59.48
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	21.42	0.65	0.02	9.01	22.47	0.49	5.66	0.05	2.19	0.16	0.12	1.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.47	0.01	0.45	1.02	0.22	0.80	0.02	0.44	0.09	0.02	0.34
d, Delay for Lane Group [s/veh]	87.88	9.96	3.85	76.86	44.94	8.98	69.24	58.80	63.10	51.56	65.99	60.98
Lane Group LOS	F	A	A	E	F	A	E	E	E	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.22	7.08	0.06	0.60	40.28	2.54	3.75	0.10	2.08	0.74	0.04	1.59
50th-Percentile Queue Length [m/ln]	16.93	53.96	0.49	4.60	306.94	19.34	28.55	0.76	15.88	5.67	0.28	12.14
95th-Percentile Queue Length [veh/ln]	4.00	11.45	0.11	1.09	51.46	4.57	6.74	0.18	3.75	1.34	0.07	2.87
95th-Percentile Queue Length [m/ln]	30.48	87.22	0.87	8.28	392.10	34.81	51.40	1.37	28.58	10.21	0.50	21.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	87.88	9.96	3.85	76.86	44.94	8.98	69.24	58.80	63.10	51.56	65.99	60.98
Movement LOS	F	A	A	E	F	A	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	13.24			42.01			67.75			57.86		
Approach LOS	B			D			E			E		
d_I, Intersection Delay [s/veh]	35.53											
Intersection LOS	D											
Intersection V/C	0.817											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	61.29	61.29	61.29	61.29
l_p,int, Pedestrian LOS Score for Intersection	4.116	3.995	2.757	2.355
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1157	1186	229	129
d_b, Bicycle Delay [s]	12.43	11.60	54.91	61.29
l_b,int, Bicycle LOS Score for Intersection	2.582	3.792	1.777	1.677
Bicycle LOS	B	D	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.156

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	30.00	3.00	10.00	1.00	1.00	25.00	2.00	1.00	2.00	9.00	21.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	24	14	4	4	1	31	4	22	40	5
Total Analysis Volume [veh/h]	6	11	97	54	17	16	4	122	16	86	161	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.20	0.02	0.16	0.25	0.02
d_M, Delay for Movement [s/veh]	7.43	0.00	0.00	7.61	0.00	0.00	14.22	12.34	9.98	15.54	14.58	8.85
Movement LOS	A	A	A	A	A	A	B	B	A	C	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.01	0.12	0.12	0.12	0.83	0.83	0.83	1.97	1.97	0.06
95th-Percentile Queue Length [m/ln]	0.09	0.09	0.09	0.89	0.89	0.89	6.35	6.35	6.35	14.99	14.99	0.49
d_A, Approach Delay [s/veh]	0.39			4.72			12.13			14.46		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	9.90											
Intersection LOS	C											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	61.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.191

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	21	7	1219	966	5
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	5	2	314	249	1
Total Analysis Volume [veh/h]	14	22	7	1257	996	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.04	0.01	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	61.07	19.10	11.69	0.00	0.00	0.00
Movement LOS	F	C	B	A	A	A
95th-Percentile Queue Length [veh/ln]	0.87	0.87	0.04	0.02	0.00	0.00
95th-Percentile Queue Length [m/ln]	6.60	6.60	0.30	0.15	0.00	0.00
d_A, Approach Delay [s/veh]	35.42		0.06		0.00	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.59					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	187.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.477

Intersection Setup

Name	Dupuy Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Dupuy Ave		Marion St		Marion St	
Base Volume Input [veh/h]	12	9	5	1275	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	58.00	2.00	60.00	3.00	3.00	56.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	9	5	1275	1011	9
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	1	371	294	3
Total Analysis Volume [veh/h]	14	10	6	1483	1176	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.48	0.02	0.02	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	187.03	72.28	15.67	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	1.85	1.85	0.05	0.03	0.00	0.00
95th-Percentile Queue Length [m/ln]	14.12	14.12	0.41	0.20	0.00	0.00
d_A, Approach Delay [s/veh]	139.22		0.06		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.27					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.377

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	4.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	239	1046	687	0	0	216
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	284	187	0	0	59
Total Analysis Volume [veh/h]	260	1137	747	0	0	235
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.31	0.01	0.01	0.00	0.00	0.38
d_M, Delay for Movement [s/veh]	11.08	0.00	0.00	0.00	0.00	14.21
Movement LOS	B	A	A	A		B
95th-Percentile Queue Length [veh/ln]	1.30	0.65	0.00	0.00	0.00	1.75
95th-Percentile Queue Length [m/ln]	9.89	4.94	0.00	0.00	0.00	13.33
d_A, Approach Delay [s/veh]	2.06		0.00		14.21	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.62					
Intersection LOS	B					

Generated with PTV VISTRO

Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	18.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	1.00	1.00	4.00	4.00	4.00	14.00	8.00	11.00	7.00	1.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	224	59	1	149	8	38	23	7	15	48	0
Total Analysis Volume [veh/h]	3	897	237	3	597	30	150	93	28	62	190	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			0			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			0			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	40	0	0	40	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	34	24	24	24
g / C, Green / Cycle	0.49	0.49	0.49	0.49	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.33	0.33	0.18	0.18	0.27	0.05	0.11
s, saturation flow rate [veh/h]	1853	1563	1831	1645	986	1178	1795
c, Capacity [veh/h]	952	759	941	799	418	148	615
d1, Uniform Delay [s]	13.86	13.88	11.29	11.31	23.15	16.69	16.90
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.40	5.01	1.04	1.34	7.58	8.43	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.65	0.69	0.35	0.37	0.65	0.42	0.31
d, Delay for Lane Group [s/veh]	17.27	18.89	12.33	12.64	30.73	25.11	18.20
Lane Group LOS	B	B	B	B	C	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.16	6.35	3.02	2.77	4.69	1.00	2.25
50th-Percentile Queue Length [m/ln]	54.58	48.42	22.99	21.10	35.72	7.64	17.18
95th-Percentile Queue Length [veh/ln]	11.55	10.49	5.43	4.98	8.24	1.80	4.06
95th-Percentile Queue Length [m/ln]	88.02	79.93	41.38	37.98	62.77	13.74	30.92

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.27	17.78	18.89	12.33	12.47	12.64	30.73	30.73	30.73	25.11	18.20	18.20
Movement LOS	B	B	B	B	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	18.01			12.48			30.73			19.90		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	18.20											
Intersection LOS	B											
Intersection V/C	0.608											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.249	2.994	0.000	0.000
Crosswalk LOS	C	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	971	971	686	686
d_b, Bicycle Delay [s]	9.26	9.26	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	2.498	2.079	2.007	1.975
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	4.00	2.00	9.00	2.00	38.00	1.00	20.00	6.00	1.00	3.00	9.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	59	0	12	47	4	0	23	9	6	52	12
Total Analysis Volume [veh/h]	25	235	0	47	188	17	0	92	35	24	207	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	40	0	0	40	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	24	24	24
g / C, Green / Cycle	0.49	0.49	0.49	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.15	0.14	0.02	0.08	0.08	0.08
s, saturation flow rate [veh/h]	1788	1709	1130	1526	1771	1587
c, Capacity [veh/h]	925	892	549	574	667	544
d1, Uniform Delay [s]	10.78	10.59	9.40	16.49	16.42	16.47
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.76	0.72	0.10	0.89	0.76	1.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.26	0.03	0.22	0.22	0.24
d, Delay for Lane Group [s/veh]	11.54	11.31	9.50	17.37	17.18	17.52
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.25	2.00	0.13	1.47	1.67	1.52
50th-Percentile Queue Length [m/ln]	17.14	15.26	1.01	11.17	12.72	11.60
95th-Percentile Queue Length [veh/ln]	4.05	3.60	0.24	2.64	3.01	2.74
95th-Percentile Queue Length [m/ln]	30.86	27.46	1.83	20.11	22.90	20.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.54	11.54	0.00	11.31	11.31	9.50	17.37	17.37	17.37	17.18	17.32	17.52
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	11.54			11.19			17.37			17.34		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.01											
Intersection LOS	B											
Intersection V/C	0.229											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	971	971	686	686
d_b, Bicycle Delay [s]	9.26	9.26	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	1.989	1.975	1.769	1.789
Bicycle LOS	A	A	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	73.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.973

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	1	990	783	1	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	5.00	5.00	1.00	2.00	1.00	2.00	1.00	1.00	2.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	305	401	64	75	789	86	1	990	783	1	847	99
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.8500	0.9200	0.9200	0.8500	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	83	109	17	20	214	23	0	269	213	0	230	27
Total Analysis Volume [veh/h]	332	436	70	82	858	93	1	1076	851	1	921	108
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			1		
v_co, Outbound Pedestrian Volume crossing	0			0			5			8		
v_ci, Inbound Pedestrian Volume crossing mi	8			5			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	27	54	0	15	42	0	0	51	0	0	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	21	47	7	33	33	48	48	48	48
g / C, Green / Cycle	0.18	0.39	0.06	0.28	0.28	0.40	0.40	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.18	0.28	0.05	0.26	0.26	0.30	0.53	0.28	0.29
s, saturation flow rate [veh/h]	1795	1811	1738	1885	1821	3560	1602	1870	1803
c, Capacity [veh/h]	314	709	104	521	504	1419	638	745	719
d1, Uniform Delay [s]	49.50	30.84	55.63	42.24	42.25	31.11	36.09	29.95	30.38
k, delay calibration	0.23	0.21	0.11	0.32	0.32	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	50.25	2.56	12.08	18.20	18.68	3.85	160.36	5.20	6.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.06	0.71	0.78	0.93	0.93	0.76	1.33	0.69	0.72
d, Delay for Lane Group [s/veh]	99.75	33.40	67.70	60.44	60.93	34.96	196.45	35.15	36.41
Lane Group LOS	F	C	E	E	E	C	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.63	12.49	2.77	16.24	15.76	13.73	46.30	13.02	13.32
50th-Percentile Queue Length [m/ln]	103.88	95.16	21.12	123.74	120.08	104.64	352.80	99.21	101.49
95th-Percentile Queue Length [veh/ln]	20.24	18.28	4.99	22.85	22.27	19.81	68.69	18.94	19.30
95th-Percentile Queue Length [m/ln]	154.26	139.32	38.01	174.10	169.69	150.95	523.39	144.30	147.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	99.75	33.40	33.40	67.70	60.66	60.93	0.00	34.96	196.45	0.00	35.70	36.41
Movement LOS	F	C	C	E	E	E		C	F		D	D
d_A, Approach Delay [s/veh]	59.68			61.24			106.28			35.78		
Approach LOS	E			E			F			D		
d_I, Intersection Delay [s/veh]	73.52											
Intersection LOS	E											
Intersection V/C	0.973											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.151	2.842	3.343	3.059
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	600	750	750
d_b, Bicycle Delay [s]	21.60	29.40	23.44	23.44
l_b,int, Bicycle LOS Score for Intersection	2.942	2.412	3.149	2.409
Bicycle LOS	C	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190722_Market_Lands_Updated_Traffic_Counts.vistro

Scenario 7 AM Peak 2025 BG

Report File: V:\...\2025 BG - AM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.848	54.8	D
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.817	34.8	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.270	9.5	A
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.307	174.1	F
13	Marion & Dupuy	Two-way stop	HCM 6th Edition	SB Left	0.393	155.4	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.418	19.8	C
15	Marion & Dawson	Signalized	HCM 6th Edition	NWB Thru	0.742	28.4	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NEB Thru	0.379	14.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	0.946	75.0	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	54.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.848

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	523	1517	1484	615	548	64
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	142	412	403	167	149	17
Total Analysis Volume [veh/h]	568	1649	1613	668	596	70
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	36	106	70	34	34	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	19	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	100	100	64	98	28	28
g / C, Green / Cycle	0.71	0.71	0.46	0.70	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.69	0.47	0.47	0.42	0.21	0.21
s, saturation flow rate [veh/h]	819	3503	3418	1589	1709	1483
c, Capacity [veh/h]	519	2502	1562	1112	342	297
d1, Uniform Delay [s]	50.78	10.80	38.00	10.87	56.00	56.00
k, delay calibration	0.50	0.50	0.50	0.50	0.39	0.39
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	67.68	1.38	31.56	2.40	54.05	58.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.09	0.66	1.03	0.60	1.04	1.04
d, Delay for Lane Group [s/veh]	118.47	12.17	69.56	13.27	110.05	114.39
Lane Group LOS	F	B	F	B	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	15.11	11.90	31.79	9.83	17.18	15.26
50th-Percentile Queue Length [m/ln]	115.15	90.67	242.22	74.90	130.87	116.29
95th-Percentile Queue Length [veh/ln]	23.06	17.56	42.08	14.97	24.51	22.19
95th-Percentile Queue Length [m/ln]	175.70	133.78	320.62	114.08	186.79	169.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	118.47	12.17	69.56	13.27	111.82	114.39
Movement LOS	F	B	F	B	F	F
d_A, Approach Delay [s/veh]	39.41		53.08		112.07	
Approach LOS	D		D		F	
d_I, Intersection Delay [s/veh]	54.82					
Intersection LOS	D					
Intersection V/C	0.848					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	0.00	59.43
l_p,int, Pedestrian LOS Score for Intersection	4.349	0.000	3.306
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	70.00	70.00	70.00
l_b,int, Bicycle LOS Score for Intersection	5.961	6.014	5.231
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	2.00	3.00	1.00	6.00	8.00	6.00	4.00	47.00	1.00	1.00	3.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	2050	37	84	1239	197	291	26	22	33	2	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	557	10	23	337	54	79	7	6	9	1	20
Total Analysis Volume [veh/h]	64	2228	40	91	1347	214	316	28	24	36	2	79
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	77	99	11	15	37	0	21	25	0	11	15	15
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	8	97	107	9	98	98	15	16	16	26	5	20
g / C, Green / Cycle	0.05	0.65	0.71	0.06	0.65	0.65	0.10	0.11	0.11	0.17	0.03	0.13
(v / s)_i Volume / Saturation Flow Rate	0.04	0.63	0.03	0.05	0.39	0.14	0.09	0.01	0.02	0.02	0.00	0.05
s, saturation flow rate [veh/h]	1509	3560	1577	1795	3446	1513	3348	1840	1571	1495	1885	1577
c, Capacity [veh/h]	81	2306	1125	108	2254	990	335	196	167	311	61	209
d1, Uniform Delay [s]	70.17	24.87	6.31	69.81	14.72	10.45	67.08	60.79	60.85	52.45	70.31	59.45
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.76	12.32	0.06	15.99	1.18	0.50	12.94	0.32	0.40	0.16	0.22	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.97	0.04	0.84	0.60	0.22	0.94	0.14	0.15	0.12	0.03	0.38
d, Delay for Lane Group [s/veh]	85.93	37.19	6.37	85.80	15.90	10.95	80.02	61.12	61.25	52.61	70.52	60.58
Lane Group LOS	F	D	A	F	B	B	F	E	E	D	E	E
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.74	36.38	0.35	3.87	12.09	2.78	6.63	0.97	0.88	1.17	0.08	2.83
50th-Percentile Queue Length [m/ln]	20.87	277.24	2.69	29.50	92.12	21.18	50.54	7.38	6.70	8.94	0.60	21.55
95th-Percentile Queue Length [veh/ln]	4.93	46.28	0.64	6.97	17.79	5.00	10.86	1.74	1.58	2.11	0.14	5.09
95th-Percentile Queue Length [m/ln]	37.56	352.62	4.84	53.09	135.57	38.13	82.72	13.28	12.06	16.10	1.08	38.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	85.93	37.19	6.37	85.80	15.90	10.95	80.02	61.12	61.25	52.61	70.52	60.58
Movement LOS	F	D	A	F	B	B	F	E	E	D	E	E
d_A, Approach Delay [s/veh]	38.00			19.11			77.36			58.30		
Approach LOS	D			B			E			E		
d_I, Intersection Delay [s/veh]	34.79											
Intersection LOS	C											
Intersection V/C	0.817											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.104	4.043	2.774	2.414
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1240	413	253	120
d_b, Bicycle Delay [s]	10.83	47.20	57.20	66.27
l_b,int, Bicycle LOS Score for Intersection	3.484	2.923	1.863	1.753
Bicycle LOS	C	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	6.00	1.00	15.00	1.00	13.00	1.00	6.00	1.00	1.00	8.00	6.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	17	164	36	5	9	23	134	9	75	83	95
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	45	10	1	2	6	36	2	20	23	26
Total Analysis Volume [veh/h]	4	18	178	39	5	10	25	146	10	82	90	103
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	784	646	709	637	761
Degree of Utilization, x	0.26	0.08	0.26	0.27	0.14

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.01	0.27	1.01	1.09	0.47
95th-Percentile Queue Length [m]	7.73	2.08	7.72	8.31	3.56
Approach Delay [s/veh]	9.16	9.08	9.81	9.59	
Approach LOS	A	A	A	A	
Intersection Delay [s/veh]	9.49				
Intersection LOS	A				

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	174.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.307

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	8	34	1039	1152	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	9	282	313	7
Total Analysis Volume [veh/h]	8	9	37	1129	1252	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.31	0.02	0.07	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	174.07	44.42	12.09	0.00	0.00	0.00
Movement LOS	F	E	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.16	1.16	0.22	0.11	0.00	0.00
95th-Percentile Queue Length [m/ln]	8.83	8.83	1.66	0.83	0.00	0.00
d_A, Approach Delay [s/veh]	105.43		0.38		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	0.91					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 13: Marion & Dupuy

Control Type:	Two-way stop	Delay (sec / veh):	155.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.393

Intersection Setup

Name	Dupuy Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Dupuy Ave		Marion St		Marion St	
Base Volume Input [veh/h]	11	11	15	915	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	55.00	82.00	27.00	3.00	4.00	50.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	12	16	995	1183	17
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	4	270	321	5
Total Analysis Volume [veh/h]	13	13	17	1082	1286	18
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.39	0.05	0.04	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	155.41	60.25	14.14	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.69	1.69	0.13	0.06	0.00	0.00
95th-Percentile Queue Length [m/ln]	12.84	12.84	0.98	0.49	0.00	0.00
d_A, Approach Delay [s/veh]	107.83		0.22		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.25					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	19.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.418

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	4.00	4.00	2.00	5.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	742	1167	1	0	159
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	202	317	0	0	43
Total Analysis Volume [veh/h]	275	807	1268	1	0	173
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.53	0.01	0.01	0.00	0.00	0.42
d_M, Delay for Movement [s/veh]	19.31	0.00	0.00	0.00	0.00	19.77
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	3.04	1.52	0.00	0.00	0.00	2.02
95th-Percentile Queue Length [m/ln]	23.16	11.58	0.00	0.00	0.00	15.36
d_A, Approach Delay [s/veh]	4.91		0.00		19.77	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.46					
Intersection LOS	C					

Generated with PTV VISTRO

Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Marion & Dawson

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	6.00	6.00	1.00	4.00	1.00	3.00	8.00	40.00	13.00	20.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	566	168	1	928	108	239	247	5	8	96	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	154	46	0	252	29	65	67	1	2	26	0
Total Analysis Volume [veh/h]	9	615	183	1	1009	117	260	268	5	9	104	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			1			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	56.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	38	0	0	38	0	0	42	0	0	42	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	32	32	32	32	36	36	36
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.33	0.33	0.41	0.01	0.07
s, saturation flow rate [veh/h]	1569	1523	1839	1611	1285	1008	1597
c, Capacity [veh/h]	673	609	781	644	645	114	719
d1, Uniform Delay [s]	18.73	19.49	21.38	21.39	22.82	12.33	12.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.05	5.36	7.18	11.00	11.56	1.35	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.61	0.65	0.77	0.82	0.83	0.08	0.15
d, Delay for Lane Group [s/veh]	22.78	24.85	28.56	32.39	34.38	13.67	13.38
Lane Group LOS	C	C	C	C	C	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.11	6.35	10.58	9.88	10.64	0.13	1.10
50th-Percentile Queue Length [m/ln]	46.56	48.41	80.61	75.30	81.04	0.95	8.37
95th-Percentile Queue Length [veh/ln]	10.16	10.49	15.91	15.04	15.98	0.23	1.98
95th-Percentile Queue Length [m/ln]	77.46	79.91	121.25	114.59	121.80	1.72	15.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.78	23.51	24.85	28.56	30.11	32.39	34.38	34.38	34.38	13.67	13.38	13.38
Movement LOS	C	C	C	C	C	C	C	C	C	B	B	B
d_A, Approach Delay [s/veh]	23.80			30.35			34.38			13.40		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	28.39											
Intersection LOS	C											
Intersection V/C	0.742											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.507	2.993	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	800	900	900
d_b, Bicycle Delay [s]	14.40	14.40	12.10	12.10
l_b,int, Bicycle LOS Score for Intersection	2.225	2.489	2.439	1.748
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.379

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	3.00	2.00	18.00	5.00	5.00	2.00	7.00	22.00	20.00	32.00	12.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	209	0	34	102	21	1	321	40	5	70	55
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	57	0	9	28	6	0	87	11	1	19	15
Total Analysis Volume [veh/h]	49	227	0	37	111	23	1	349	43	5	76	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	22	22	22	26	26	26
g / C, Green / Cycle	0.37	0.37	0.37	0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.16	0.09	0.01	0.22	0.05	0.06
s, saturation flow rate [veh/h]	1767	1673	1551	1761	1391	1112
c, Capacity [veh/h]	719	688	569	823	667	482
d1, Uniform Delay [s]	14.14	13.10	12.21	12.40	10.17	10.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.55	0.71	0.13	1.98	0.34	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.38	0.21	0.04	0.48	0.11	0.14
d, Delay for Lane Group [s/veh]	15.69	13.81	12.35	14.38	10.52	10.83
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.69	1.32	0.19	3.60	0.56	0.51
50th-Percentile Queue Length [m/ln]	20.50	10.05	1.47	27.47	4.26	3.91
95th-Percentile Queue Length [veh/ln]	4.84	2.37	0.35	6.49	1.01	0.92
95th-Percentile Queue Length [m/ln]	36.90	18.09	2.64	49.45	7.67	7.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.69	15.69	0.00	13.81	13.81	12.35	14.38	14.38	14.38	10.52	10.54	10.83
Movement LOS	B	B		B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	15.69			13.61			14.38			10.66		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.08											
Intersection LOS	B											
Intersection V/C	0.379											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	733	867	867
d_b, Bicycle Delay [s]	12.03	12.03	9.63	9.63
l_b,int, Bicycle LOS Score for Intersection	2.015	1.842	2.208	1.676
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	75.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.946

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	9.00	4.00	5.00	1.00	3.00	2.00	1.00	3.00	11.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	871	826	67	72	271	89	2	794	292	3	924	88
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9600	0.9200	0.9200	0.9600	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	237	224	18	20	74	24	1	216	79	1	251	24
Total Analysis Volume [veh/h]	947	898	73	78	295	97	2	863	317	3	1004	96
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			8			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			8			8		
v_co, Outbound Pedestrian Volume crossing	0			0			8			1		
v_ci, Inbound Pedestrian Volume crossing mi	8			1			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	76.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	62	68	0	12	18	0	0	40	0	0	40	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	56	63	6	13	13	35	35	35	35
g / C, Green / Cycle	0.47	0.53	0.05	0.11	0.11	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.53	0.52	0.05	0.11	0.11	0.24	0.20	0.30	0.31
s, saturation flow rate [veh/h]	1795	1860	1681	1840	1688	3532	1589	1855	1800
c, Capacity [veh/h]	838	977	84	199	183	1030	464	541	525
d1, Uniform Delay [s]	32.00	28.32	56.79	53.50	53.50	39.84	37.60	42.50	42.50
k, delay calibration	0.50	0.46	0.11	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	73.53	26.27	30.67	33.35	41.12	8.12	7.95	42.92	52.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.13	0.99	0.93	1.01	1.04	0.84	0.68	1.02	1.05
d, Delay for Lane Group [s/veh]	105.53	54.59	87.45	86.85	94.62	47.96	45.56	85.42	94.91
Lane Group LOS	F	D	F	F	F	D	D	F	F
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	39.99	32.76	3.04	7.77	7.52	12.81	9.10	22.03	22.75
50th-Percentile Queue Length [m/ln]	304.71	249.62	23.19	59.23	57.33	97.60	69.35	167.86	173.39
95th-Percentile Queue Length [veh/ln]	55.18	42.15	5.48	12.42	12.20	18.68	14.05	30.05	31.51
95th-Percentile Queue Length [m/ln]	420.49	321.15	41.74	94.63	92.96	142.33	107.05	228.98	240.13

Movement, Approach, & Intersection Results

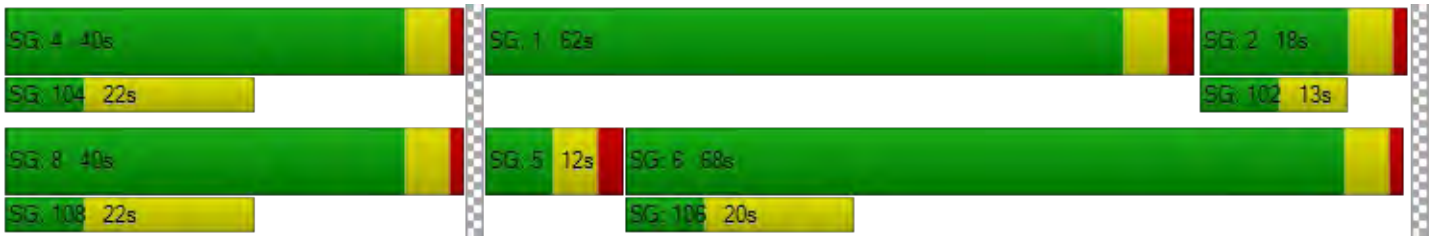
d_M, Delay for Movement [s/veh]	105.53	54.59	54.59	87.45	89.30	94.62	0.00	47.96	45.56	0.00	89.71	94.91
Movement LOS	F	D	D	F	F	F		D	D		F	F
d_A, Approach Delay [s/veh]	79.74			90.09			47.31			90.16		
Approach LOS	E			F			D			F		
d_I, Intersection Delay [s/veh]	75.04											
Intersection LOS	E											
Intersection V/C	0.946											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersection	3.146	2.806	3.331	3.013
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1050	217	583	583
d_b, Bicycle Delay [s]	13.54	47.70	30.10	30.10
l_b,int, Bicycle LOS Score for Intersection	4.724	1.947	2.533	2.467
Bicycle LOS	E	A	B	B

Sequence

Ring 1	4	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	8	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 8 PM Peak 2025 BG

Report File: V:\...\2025 BG - PM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	EB Right	1.013	84.7	F
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.888	51.4	D
9	Maginot & Speers	Two-way stop	HCM 6th Edition	WB Left	0.190	17.7	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.260	79.7	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	SB Left	0.502	198.8	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.429	15.5	C
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Left	0.667	20.5	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.248	12.9	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	1.058	91.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	84.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.013

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	3.00	2.00	2.00	1.00	3.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1328	1975	441	723	305
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	361	537	120	196	83
Total Analysis Volume [veh/h]	122	1443	2147	479	786	332
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	17	99	82	51	51	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	5	7	7	7	0
Pedestrian Clearance [s]	0	10	19	21	21	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	11	93	76	127	45	45
g / C, Green / Cycle	0.07	0.62	0.51	0.85	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.41	0.60	0.30	0.31	0.34
s, saturation flow rate [veh/h]	1652	3532	3560	1589	1795	1648
c, Capacity [veh/h]	121	2190	1804	1345	539	494
d1, Uniform Delay [s]	69.50	18.31	37.00	2.52	52.50	52.50
k, delay calibration	0.11	0.50	0.50	0.44	0.47	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	39.71	1.57	91.42	0.65	50.23	78.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.01	0.66	1.19	0.36	1.05	1.12
d, Delay for Lane Group [s/veh]	109.21	19.88	128.42	3.17	102.73	130.76
Lane Group LOS	F	B	F	A	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.89	15.18	53.58	2.03	27.70	29.27
50th-Percentile Queue Length [m/ln]	44.89	115.69	408.26	15.48	211.06	223.06
95th-Percentile Queue Length [veh/ln]	9.89	21.57	74.73	3.66	37.44	41.02
95th-Percentile Queue Length [m/ln]	75.40	164.39	569.45	27.86	285.30	312.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	109.21	19.88	128.42	3.17	110.73	130.76
Movement LOS	F	B	F	A	F	F
d_A, Approach Delay [s/veh]	26.85		105.57		116.63	
Approach LOS	C		F		F	
d_I, Intersection Delay [s/veh]	84.69					
Intersection LOS	F					
Intersection V/C	1.013					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	0.00	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.427	0.000	2.854
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	75.00	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	5.424	6.299	5.977
Bicycle LOS	F	F	F

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	51.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.888

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	3.00	20.00	8.00	2.00	5.00	7.00	1.00	12.00	1.00	1.00	13.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	1175	11	15	2457	234	202	3	59	24	1	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	319	3	4	668	64	55	1	16	7	0	13
Total Analysis Volume [veh/h]	58	1277	12	16	2671	254	220	3	64	26	1	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	65	101	11	11	47	0	17	27	0	11	21	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	7	107	117	3	103	103	11	12	12	21	4	14
g / C, Green / Cycle	0.05	0.71	0.78	0.02	0.69	0.69	0.07	0.08	0.08	0.14	0.03	0.09
(v / s)_i Volume / Saturation Flow Rate	0.04	0.36	0.01	0.01	0.75	0.16	0.07	0.00	0.04	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1509	3532	1360	1695	3560	1551	3320	1885	1602	1498	1885	1449
c, Capacity [veh/h]	73	2524	1056	38	2451	1068	243	152	130	236	56	133
d1, Uniform Delay [s]	70.61	9.56	3.77	72.38	23.36	8.70	68.97	63.46	66.00	56.00	70.66	64.06
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.06	0.73	0.02	7.36	47.85	0.53	11.78	0.05	2.89	0.20	0.13	1.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.51	0.01	0.42	1.09	0.24	0.90	0.02	0.49	0.11	0.02	0.38
d, Delay for Lane Group [s/veh]	87.67	10.29	3.79	79.73	71.21	9.23	80.76	63.51	68.89	56.21	70.79	65.80
Lane Group LOS	F	B	A	E	F	A	F	E	E	E	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.51	8.36	0.07	0.67	52.38	2.94	4.60	0.11	2.46	0.88	0.04	1.87
50th-Percentile Queue Length [m/ln]	19.14	63.67	0.55	5.14	399.14	22.42	35.06	0.83	18.76	6.69	0.30	14.27
95th-Percentile Queue Length [veh/ln]	4.52	13.10	0.13	1.21	69.39	5.30	8.12	0.20	4.43	1.58	0.07	3.37
95th-Percentile Queue Length [m/ln]	34.45	99.79	0.99	9.25	528.72	40.35	61.87	1.49	33.77	12.05	0.54	25.68

Movement, Approach, & Intersection Results

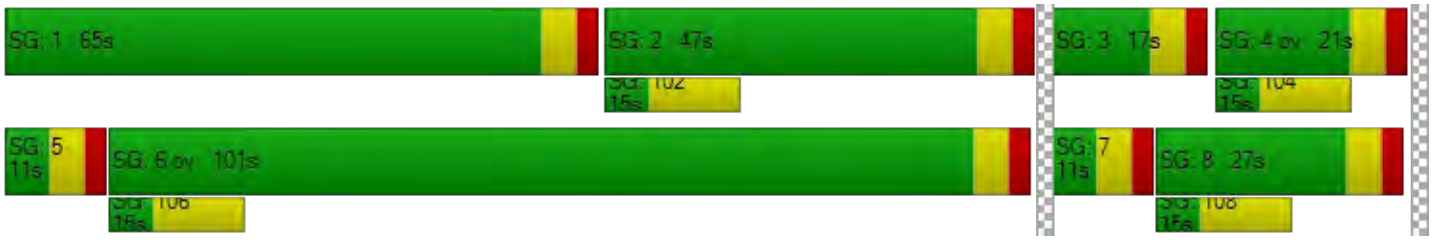
d_M, Delay for Movement [s/veh]	87.67	10.29	3.79	79.73	71.21	9.23	80.76	63.51	68.89	56.21	70.79	65.80
Movement LOS	F	B	A	E	F	A	F	E	E	E	E	E
d_A, Approach Delay [s/veh]	13.56			65.90			77.93			62.63		
Approach LOS	B			E			E			E		
d_I, Intersection Delay [s/veh]	51.44											
Intersection LOS	D											
Intersection V/C	0.888											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	66.27	66.27	66.27	66.27
l_p,int, Pedestrian LOS Score for Intersection	4.262	4.113	2.768	2.360
Crosswalk LOS	E	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1267	547	280	200
d_b, Bicycle Delay [s]	10.08	39.60	55.47	60.75
l_b,int, Bicycle LOS Score for Intersection	2.671	3.986	1.796	1.687
Bicycle LOS	B	D	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	Two-way stop	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.190

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	30.00	3.00	10.00	1.00	1.00	25.00	2.00	1.00	2.00	9.00	21.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	11	99	55	17	16	4	125	16	88	164	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	27	15	5	4	1	34	4	24	45	6
Total Analysis Volume [veh/h]	8	12	108	60	18	17	4	136	17	96	178	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.04	0.00	0.00	0.01	0.23	0.02	0.19	0.29	0.02
d_M, Delay for Movement [s/veh]	7.44	0.00	0.00	7.65	0.00	0.00	15.41	13.01	10.39	17.69	16.38	8.90
Movement LOS	A	A	A	A	A	A	C	B	B	C	C	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.13	0.13	0.13	1.00	1.00	1.00	2.56	2.56	0.07
95th-Percentile Queue Length [m/ln]	0.12	0.12	0.12	1.01	1.01	1.01	7.64	7.64	7.64	19.50	19.50	0.57
d_A, Approach Delay [s/veh]	0.46			4.83			12.79			16.22		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	10.85											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	79.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.260

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	23	8	1325	1050	5
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	6	2	341	271	1
Total Analysis Volume [veh/h]	15	24	8	1366	1082	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.26	0.05	0.02	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	79.67	24.93	12.31	0.00	0.00	0.00
Movement LOS	F	C	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.21	1.21	0.05	0.02	0.00	0.00
95th-Percentile Queue Length [m/ln]	9.24	9.24	0.37	0.19	0.00	0.00
d_A, Approach Delay [s/veh]	45.99		0.07		0.00	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.76					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	198.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.502

Intersection Setup

Name	Dupuy Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Dupuy Ave		Marion St		Marion St	
Base Volume Input [veh/h]	12	9	5	1275	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	58.00	2.00	60.00	3.00	3.00	56.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	10	5	1386	1099	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	3	1	377	299	3
Total Analysis Volume [veh/h]	14	11	5	1507	1195	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.50	0.02	0.01	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	198.81	77.90	15.89	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	1.96	1.96	0.05	0.02	0.00	0.00
95th-Percentile Queue Length [m/ln]	14.97	14.97	0.35	0.17	0.00	0.00
d_A, Approach Delay [s/veh]	145.61		0.05		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.36					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.429

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	4.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	1137	747	0	0	235
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	309	203	0	0	64
Total Analysis Volume [veh/h]	283	1236	812	0	0	255
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.35	0.01	0.01	0.00	0.00	0.43
d_M, Delay for Movement [s/veh]	11.89	0.00	0.00	0.00	0.00	15.53
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	1.59	0.80	0.00	0.00	0.00	2.15
95th-Percentile Queue Length [m/ln]	12.13	6.06	0.00	0.00	0.00	16.35
d_A, Approach Delay [s/veh]	2.22		0.00		15.53	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.83					
Intersection LOS	C					

Generated with PTV VISTRO

Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	1.00	1.00	4.00	4.00	4.00	14.00	8.00	11.00	7.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	897	237	3	597	30	150	93	28	62	190	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	244	64	1	162	8	41	25	8	17	52	0
Total Analysis Volume [veh/h]	3	975	258	3	649	33	163	101	30	67	207	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			0			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			0			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	39	0	0	39	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	33	33	33	33	25	25	25
g / C, Green / Cycle	0.47	0.47	0.47	0.47	0.36	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.36	0.36	0.20	0.20	0.30	0.06	0.12
s, saturation flow rate [veh/h]	1853	1563	1831	1645	967	1168	1795
c, Capacity [veh/h]	925	737	915	775	425	132	641
d1, Uniform Delay [s]	15.29	15.35	12.16	12.18	23.24	16.12	16.35
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.89	7.61	1.27	1.66	8.92	13.34	1.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.77	0.39	0.42	0.69	0.51	0.32
d, Delay for Lane Group [s/veh]	20.18	22.96	13.44	13.84	32.16	29.46	17.68
Lane Group LOS	C	C	B	B	C	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.65	7.84	3.49	3.21	5.23	1.18	2.41
50th-Percentile Queue Length [m/ln]	65.89	59.78	26.62	24.46	39.86	9.00	18.37
95th-Percentile Queue Length [veh/ln]	13.47	12.44	6.29	5.78	8.98	2.13	4.34
95th-Percentile Queue Length [m/ln]	102.63	94.78	47.91	44.03	68.44	16.21	33.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.18	21.06	22.96	13.44	13.62	13.84	32.16	32.16	32.16	29.46	17.68	17.68
Movement LOS	C	C	C	B	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	21.46			13.63			32.16			20.56		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	20.47											
Intersection LOS	C											
Intersection V/C	0.667											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.348	3.069	0.000	0.000
Crosswalk LOS	C	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	943	943	714	714
d_b, Bicycle Delay [s]	9.78	9.78	14.46	14.46
l_b,int, Bicycle LOS Score for Intersection	2.579	2.125	2.045	2.012
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.248

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	4.00	2.00	9.00	2.00	38.00	1.00	20.00	6.00	1.00	3.00	9.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	235	0	47	188	17	0	92	35	24	207	47
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	64	0	13	51	5	0	25	10	7	56	13
Total Analysis Volume [veh/h]	27	255	0	51	204	18	0	100	38	26	225	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	34	0	0	34	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	20	20	20
g / C, Green / Cycle	0.47	0.47	0.47	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.02	0.09	0.09	0.09
s, saturation flow rate [veh/h]	1792	1712	1130	1526	1776	1587
c, Capacity [veh/h]	902	871	527	569	662	529
d1, Uniform Delay [s]	10.08	9.88	8.67	14.66	14.59	14.64
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.91	0.85	0.12	1.01	0.87	1.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.29	0.03	0.24	0.24	0.27
d, Delay for Lane Group [s/veh]	10.98	10.73	8.79	15.67	15.46	15.88
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.12	1.88	0.12	1.36	1.54	1.41
50th-Percentile Queue Length [m/ln]	16.13	14.34	0.93	10.35	11.77	10.76
95th-Percentile Queue Length [veh/ln]	3.81	3.39	0.22	2.44	2.78	2.54
95th-Percentile Queue Length [m/ln]	29.03	25.81	1.67	18.63	21.18	19.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.98	10.98	0.00	10.73	10.73	8.79	15.67	15.67	15.67	15.46	15.63	15.88
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	10.98			10.61			15.67			15.66		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	12.95											
Intersection LOS	B											
Intersection V/C	0.248											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	933	667	667
d_b, Bicycle Delay [s]	8.53	8.53	13.33	13.33
l_b,int, Bicycle LOS Score for Intersection	2.025	2.010	1.787	1.809
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	91.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.058

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	1	990	783	1	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	5.00	5.00	1.00	2.00	1.00	2.00	1.00	1.00	2.00	7.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	332	436	70	82	858	93	1	1076	851	1	921	108
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.8500	0.9200	0.9200	0.8500	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	118	19	22	233	25	0	292	231	0	250	29
Total Analysis Volume [veh/h]	361	474	76	89	933	101	1	1170	925	1	1001	117
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			1		
v_co, Outbound Pedestrian Volume crossing	0			0			5			8		
v_ci, Inbound Pedestrian Volume crossing mi	8			5			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	30	55	0	14	39	0	0	71	0	0	71	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	24	49	8	33	33	65	65	65	65
g / C, Green / Cycle	0.17	0.35	0.06	0.24	0.24	0.46	0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.20	0.30	0.05	0.28	0.28	0.33	0.58	0.30	0.31
s, saturation flow rate [veh/h]	1795	1811	1738	1885	1821	3560	1602	1870	1803
c, Capacity [veh/h]	308	634	99	444	429	1653	744	868	837
d1, Uniform Delay [s]	58.00	42.48	65.59	53.50	53.50	29.92	37.50	28.66	29.11
k, delay calibration	0.37	0.35	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	100.33	10.88	22.73	103.30	104.28	2.59	120.76	3.66	4.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.17	0.87	0.90	1.18	1.18	0.71	1.24	0.64	0.67
d, Delay for Lane Group [s/veh]	158.33	53.35	88.32	156.80	157.78	32.51	158.26	32.32	33.31
Lane Group LOS	F	D	F	F	F	C	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	19.35	19.34	3.76	28.16	27.32	15.95	49.42	14.93	15.25
50th-Percentile Queue Length [m/ln]	147.46	147.40	28.69	214.58	208.20	121.51	376.58	113.78	116.21
95th-Percentile Queue Length [veh/ln]	28.70	26.56	6.78	40.49	39.42	22.49	70.94	21.27	21.65
95th-Percentile Queue Length [m/ln]	218.72	202.36	51.64	308.50	300.42	171.41	540.58	162.08	165.01

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	158.33	53.35	53.35	88.32	157.23	157.78	0.00	32.51	158.26	0.00	32.76	33.31
Movement LOS	F	D	D	F	F	F		C	F		C	C
d_A, Approach Delay [s/veh]	94.95			151.82			88.03			32.82		
Approach LOS	F			F			F			C		
d_I, Intersection Delay [s/veh]	91.12											
Intersection LOS	F											
Intersection V/C	1.058											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	59.43	59.43	59.43
l_p,int, Pedestrian LOS Score for Intersection	3.229	2.893	3.423	3.129
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	700	471	929	929
d_b, Bicycle Delay [s]	29.58	40.89	20.09	20.09
l_b,int, Bicycle LOS Score for Intersection	3.063	2.486	3.288	2.482
Bicycle LOS	C	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 15 AM Peak 2025 BG - Mitig. 1

Report File: V:\...\2025 BG w Mitig - AM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.672	24.8	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.628	22.5	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.270	9.5	A
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.307	174.1	F
13	Marion & Dupuy	Two-way stop	HCM 6th Edition	SB Left	0.557	245.9	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.418	19.8	C
15	Marion & Dawson	Signalized	HCM 6th Edition	NWB Thru	0.742	28.4	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NEB Thru	0.379	14.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	SB Left	0.690	28.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	2	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	523	1517	1484	615	548	64
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	142	412	403	167	149	17
Total Analysis Volume [veh/h]	568	1649	1613	668	596	70
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	4	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	42	78	36	32	32	32
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	19	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	No	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	21	72	45	77	26	53
g / C, Green / Cycle	0.19	0.65	0.41	0.70	0.24	0.48
(v / s)_i Volume / Saturation Flow Rate	0.16	0.33	0.33	0.42	0.18	0.05
s, saturation flow rate [veh/h]	3486	5012	4889	1589	3320	1359
c, Capacity [veh/h]	672	3281	1991	1109	785	657
d1, Uniform Delay [s]	42.81	9.78	28.85	8.65	39.09	15.45
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.02	0.55	3.70	2.42	1.54	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.50	0.81	0.60	0.76	0.11
d, Delay for Lane Group [s/veh]	45.83	10.34	32.54	11.07	40.63	15.53
Lane Group LOS	D	B	C	B	D	B
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.38	5.72	12.16	6.99	7.58	0.96
50th-Percentile Queue Length [m/ln]	56.21	43.58	92.67	53.27	57.74	7.34
95th-Percentile Queue Length [veh/ln]	11.83	9.64	17.88	11.33	12.09	1.73
95th-Percentile Queue Length [m/ln]	90.15	73.46	136.25	86.31	92.15	13.20

Movement, Approach, & Intersection Results

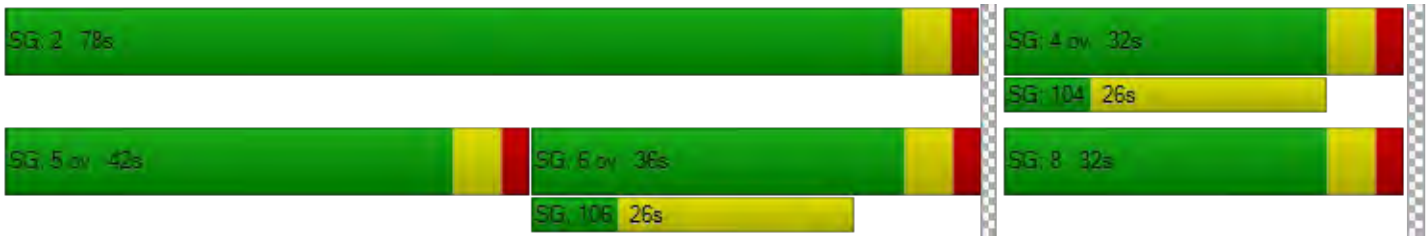
d_M, Delay for Movement [s/veh]	45.83	10.34	32.54	11.07	40.63	15.53
Movement LOS	D	B	C	B	D	B
d_A, Approach Delay [s/veh]	19.43		26.26		38.00	
Approach LOS	B		C		D	
d_I, Intersection Delay [s/veh]	24.84					
Intersection LOS	C					
Intersection V/C	0.672					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	0.00	44.55
l_p,int, Pedestrian LOS Score for Intersection	4.003	0.000	2.928
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	5.352	5.387	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	2.00	3.00	1.00	6.00	8.00	6.00	4.00	47.00	1.00	1.00	3.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	2050	37	84	1239	197	291	26	22	33	2	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	557	10	23	337	54	79	7	6	9	1	20
Total Analysis Volume [veh/h]	64	2228	40	91	1347	214	316	28	24	36	2	79
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	32	54	11	13	35	0	16	22	0	11	17	13
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	5	55	64	6	56	56	10	11	11	20	4	17
g / C, Green / Cycle	0.05	0.55	0.64	0.06	0.56	0.56	0.10	0.11	0.11	0.20	0.04	0.17
(v / s)_i Volume / Saturation Flow Rate	0.04	0.44	0.03	0.05	0.27	0.14	0.09	0.01	0.02	0.02	0.00	0.05
s, saturation flow rate [veh/h]	1509	5094	1577	1795	4930	1513	3348	1840	1571	1514	1885	1577
c, Capacity [veh/h]	81	2803	1012	116	2767	849	335	209	178	401	85	267
d1, Uniform Delay [s]	46.77	17.97	6.57	46.10	13.24	11.21	44.72	39.89	39.92	32.24	45.63	36.29
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.72	2.42	0.07	11.14	0.62	0.71	12.94	0.28	0.35	0.10	0.11	0.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.79	0.04	0.79	0.49	0.25	0.94	0.13	0.14	0.09	0.02	0.30
d, Delay for Lane Group [s/veh]	62.49	20.39	6.64	57.24	13.86	11.92	57.66	40.17	40.27	32.33	45.74	36.90
Lane Group LOS	E	C	A	E	B	B	E	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.86	12.12	0.27	2.49	5.34	2.26	4.45	0.62	0.56	0.71	0.05	1.72
50th-Percentile Queue Length [m/ln]	14.16	92.33	2.08	18.95	40.67	17.20	33.92	4.71	4.28	5.44	0.38	13.11
95th-Percentile Queue Length [veh/ln]	3.35	17.83	0.49	4.48	9.13	4.06	7.91	1.11	1.01	1.29	0.09	3.10
95th-Percentile Queue Length [m/ln]	25.49	135.84	3.75	34.11	69.53	30.97	60.29	8.47	7.71	9.80	0.68	23.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	62.49	20.39	6.64	57.24	13.86	11.92	57.66	40.17	40.27	32.33	45.74	36.90
Movement LOS	E	C	A	E	B	B	E	D	D	C	D	D
d_A, Approach Delay [s/veh]	21.31			16.00			55.19			35.65		
Approach LOS	C			B			E			D		
d_I, Intersection Delay [s/veh]	22.51											
Intersection LOS	C											
Intersection V/C	0.628											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.952	3.954	2.755	2.394
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	960	580	320	220
d_b, Bicycle Delay [s]	13.52	25.21	35.28	39.61
l_b,int, Bicycle LOS Score for Intersection	2.842	2.468	1.863	1.753
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	6.00	1.00	15.00	1.00	13.00	1.00	6.00	1.00	1.00	8.00	6.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	17	164	36	5	9	23	134	9	75	83	95
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	45	10	1	2	6	36	2	20	23	26
Total Analysis Volume [veh/h]	4	18	178	39	5	10	25	146	10	82	90	103
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	784	646	709	637	761
Degree of Utilization, x	0.26	0.08	0.26	0.27	0.14

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.01	0.27	1.01	1.09	0.47
95th-Percentile Queue Length [m]	7.73	2.08	7.72	8.31	3.56
Approach Delay [s/veh]	9.16	9.08	9.81	9.59	
Approach LOS	A	A	A	A	
Intersection Delay [s/veh]	9.49				
Intersection LOS	A				

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	174.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.307

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	8	34	1039	1152	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	9	282	313	7
Total Analysis Volume [veh/h]	8	9	37	1129	1252	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.31	0.02	0.07	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	174.07	44.42	12.09	0.00	0.00	0.00
Movement LOS	F	E	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.16	1.16	0.22	0.11	0.00	0.00
95th-Percentile Queue Length [m/ln]	8.83	8.83	1.66	0.83	0.00	0.00
d_A, Approach Delay [s/veh]	105.43		0.38		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	0.91					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Marion & Dupuy

Control Type:	Two-way stop	Delay (sec / veh):	245.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.557

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	11	0	11	15	915	0	0	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	12	0	12	16	995	0	0	1183	17
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9500	0.9500	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	3	0	3	4	270	0	0	321	5
Total Analysis Volume [veh/h]	0	0	0	13	0	13	17	1082	0	0	1286	18
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.56	0.00	0.05	0.04	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	78.68	124.71	12.42	245.95	209.85	105.36	14.14	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	B	F	F	F	B	A			A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	2.24	2.24	2.24	0.13	0.06	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	17.07	17.07	17.07	0.98	0.49	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	71.94			175.65			0.22			0.00		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	1.98											
Intersection LOS	F											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	19.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.418

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	4.00	4.00	2.00	5.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	742	1167	1	0	159
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	202	317	0	0	43
Total Analysis Volume [veh/h]	275	807	1268	1	0	173
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.53	0.01	0.01	0.00	0.00	0.42
d_M, Delay for Movement [s/veh]	19.31	0.00	0.00	0.00	0.00	19.77
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	3.04	1.52	0.00	0.00	0.00	2.02
95th-Percentile Queue Length [m/ln]	23.16	11.58	0.00	0.00	0.00	15.36
d_A, Approach Delay [s/veh]	4.91		0.00		19.77	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.46					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Marion & Dawson

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	6.00	6.00	1.00	4.00	1.00	3.00	8.00	40.00	13.00	20.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	566	168	1	928	108	239	247	5	8	96	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	154	46	0	252	29	65	67	1	2	26	0
Total Analysis Volume [veh/h]	9	615	183	1	1009	117	260	268	5	9	104	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			1			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	56.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	38	0	0	38	0	0	42	0	0	42	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	32	32	32	32	36	36	36
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.33	0.33	0.41	0.01	0.07
s, saturation flow rate [veh/h]	1569	1523	1839	1611	1285	1008	1597
c, Capacity [veh/h]	673	609	781	644	645	114	719
d1, Uniform Delay [s]	18.73	19.49	21.38	21.39	22.82	12.33	12.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.05	5.36	7.18	11.00	11.56	1.35	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.61	0.65	0.77	0.82	0.83	0.08	0.15
d, Delay for Lane Group [s/veh]	22.78	24.85	28.56	32.39	34.38	13.67	13.38
Lane Group LOS	C	C	C	C	C	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.11	6.35	10.58	9.88	10.64	0.13	1.10
50th-Percentile Queue Length [m/ln]	46.56	48.41	80.61	75.30	81.04	0.95	8.37
95th-Percentile Queue Length [veh/ln]	10.16	10.49	15.91	15.04	15.98	0.23	1.98
95th-Percentile Queue Length [m/ln]	77.46	79.91	121.25	114.59	121.80	1.72	15.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.78	23.51	24.85	28.56	30.11	32.39	34.38	34.38	34.38	13.67	13.38	13.38
Movement LOS	C	C	C	C	C	C	C	C	C	B	B	B
d_A, Approach Delay [s/veh]	23.80			30.35			34.38			13.40		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	28.39											
Intersection LOS	C											
Intersection V/C	0.742											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.507	2.993	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	800	900	900
d_b, Bicycle Delay [s]	14.40	14.40	12.10	12.10
l_b,int, Bicycle LOS Score for Intersection	2.225	2.489	2.439	1.748
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Generated with PTV VISTRO

Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.379

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	3.00	2.00	18.00	5.00	5.00	2.00	7.00	22.00	20.00	32.00	12.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	209	0	34	102	21	1	321	40	5	70	55
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	57	0	9	28	6	0	87	11	1	19	15
Total Analysis Volume [veh/h]	49	227	0	37	111	23	1	349	43	5	76	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	22	22	22	26	26	26
g / C, Green / Cycle	0.37	0.37	0.37	0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.16	0.09	0.01	0.22	0.05	0.06
s, saturation flow rate [veh/h]	1767	1673	1551	1761	1391	1112
c, Capacity [veh/h]	719	688	569	823	667	482
d1, Uniform Delay [s]	14.14	13.10	12.21	12.40	10.17	10.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.55	0.71	0.13	1.98	0.34	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.38	0.21	0.04	0.48	0.11	0.14
d, Delay for Lane Group [s/veh]	15.69	13.81	12.35	14.38	10.52	10.83
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.69	1.32	0.19	3.60	0.56	0.51
50th-Percentile Queue Length [m/ln]	20.50	10.05	1.47	27.47	4.26	3.91
95th-Percentile Queue Length [veh/ln]	4.84	2.37	0.35	6.49	1.01	0.92
95th-Percentile Queue Length [m/ln]	36.90	18.09	2.64	49.45	7.67	7.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.69	15.69	0.00	13.81	13.81	12.35	14.38	14.38	14.38	10.52	10.54	10.83
Movement LOS	B	B		B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	15.69			13.61			14.38			10.66		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.08											
Intersection LOS	B											
Intersection V/C	0.379											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	733	867	867
d_b, Bicycle Delay [s]	12.03	12.03	9.63	9.63
l_b,int, Bicycle LOS Score for Intersection	2.015	1.842	2.208	1.676
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	150.00	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	9.00	4.00	5.00	1.00	3.00	2.00	1.00	3.00	11.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	871	826	67	72	271	89	2	794	292	3	924	88
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9600	0.9200	0.9200	0.9600	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	237	224	18	20	74	24	1	216	79	1	251	24
Total Analysis Volume [veh/h]	947	898	73	78	295	97	2	863	317	3	1004	96
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			8			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			8			8		
v_co, Outbound Pedestrian Volume crossing	0			0			8			1		
v_ci, Inbound Pedestrian Volume crossing mi	8			1			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	76.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	30	27	0	26	23	0	0	27	27	0	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	5.00	5.00	6.00	5.00	5.00	5.00	6.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	3.00	4.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	24	30	30	5	11	11	29	58	29	29
g / C, Green / Cycle	0.29	0.38	0.38	0.06	0.14	0.14	0.36	0.72	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.27	0.26	0.26	0.05	0.11	0.11	0.24	0.11	0.30	0.31
s, saturation flow rate [veh/h]	3486	1885	1836	1681	1840	1688	3532	2805	1855	1800
c, Capacity [veh/h]	1027	709	691	104	264	242	1278	2016	671	651
d1, Uniform Delay [s]	27.34	20.96	21.14	36.93	32.96	33.05	21.55	3.56	23.15	23.45
k, delay calibration	0.11	0.12	0.13	0.11	0.11	0.11	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.04	1.33	1.60	10.43	4.61	5.48	2.87	0.04	10.73	12.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.68	0.70	0.75	0.77	0.78	0.68	0.16	0.82	0.84
d, Delay for Lane Group [s/veh]	31.37	22.29	22.74	47.37	37.57	38.54	24.42	3.60	33.88	36.15
Lane Group LOS	C	C	C	D	D	D	C	A	C	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.68	7.22	7.31	1.75	3.93	3.75	6.77	0.55	10.57	10.98
50th-Percentile Queue Length [m/ln]	66.13	54.99	55.72	13.30	29.98	28.59	51.56	4.19	80.52	83.63
95th-Percentile Queue Length [veh/ln]	13.51	11.62	11.75	3.14	7.08	6.75	11.03	0.99	15.90	16.41
95th-Percentile Queue Length [m/ln]	102.95	88.56	89.51	23.94	53.97	51.46	84.06	7.55	121.14	125.03

Movement, Approach, & Intersection Results

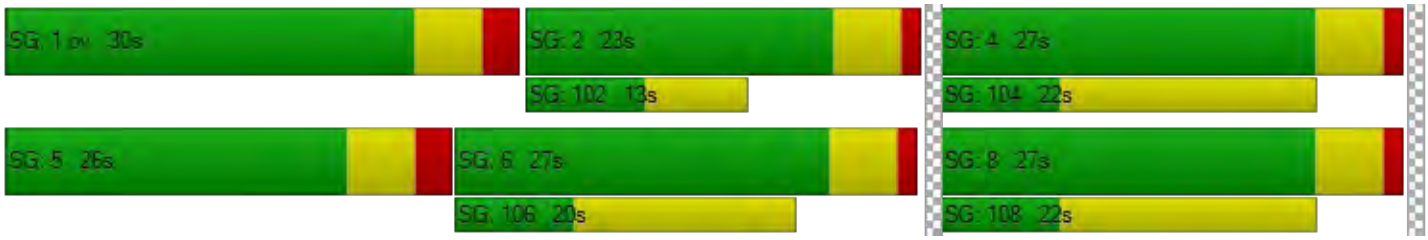
d_M, Delay for Movement [s/veh]	31.37	22.49	22.74	47.37	37.88	38.54	0.00	24.42	3.60	0.00	34.90	36.15
Movement LOS	C	C	C	D	D	D		C	A		C	D
d_A, Approach Delay [s/veh]	26.89			39.59			18.83			35.01		
Approach LOS	C			D			B			D		
d_I, Intersection Delay [s/veh]	28.04											
Intersection LOS	C											
Intersection V/C	0.690											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	3.178	2.861	3.327	2.993
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	550	450	550	550
d_b, Bicycle Delay [s]	21.03	24.03	21.03	21.03
l_b,int, Bicycle LOS Score for Intersection	3.142	1.947	2.533	2.467
Bicycle LOS	C	A	B	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 16 PM Peak 2025 BG - Mitig. 1

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7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.685	24.7	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.662	19.5	B
9	Maginot & Speers	Two-way stop	HCM 6th Edition	WB Left	0.190	17.7	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.260	79.7	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	SB Left	0.731	338.0	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.429	15.5	C
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Left	0.657	22.5	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.248	12.9	B
19	Archibald & Marion	Signalized	HCM 6th Edition	SB Left	0.711	20.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	2	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	3.00	2.00	2.00	1.00	3.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1328	1975	441	723	305
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	361	537	120	196	83
Total Analysis Volume [veh/h]	122	1443	2147	479	786	332
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	4	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	14	56	42	34	34	34
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	5	7	7	7	0
Pedestrian Clearance [s]	0	10	19	21	21	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	No	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	8	54	40	70	24	38
g / C, Green / Cycle	0.09	0.60	0.44	0.78	0.27	0.43
(v / s)_i Volume / Saturation Flow Rate	0.04	0.29	0.42	0.30	0.23	0.21
s, saturation flow rate [veh/h]	3209	5053	5094	1589	3486	1575
c, Capacity [veh/h]	285	3010	2242	1236	945	672
d1, Uniform Delay [s]	38.83	10.29	24.38	3.18	30.88	18.75
k, delay calibration	0.11	0.50	0.50	0.34	0.11	0.15
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.02	0.55	11.36	0.63	1.99	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.48	0.96	0.39	0.83	0.49
d, Delay for Lane Group [s/veh]	39.85	10.84	35.73	3.81	32.87	19.55
Lane Group LOS	D	B	D	A	C	B
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.24	4.40	14.98	1.43	8.03	4.95
50th-Percentile Queue Length [m/ln]	9.49	33.55	114.12	10.92	61.18	37.74
95th-Percentile Queue Length [veh/ln]	2.24	7.84	21.32	2.58	12.68	8.60
95th-Percentile Queue Length [m/ln]	17.08	59.77	162.48	19.66	96.59	65.55

Movement, Approach, & Intersection Results

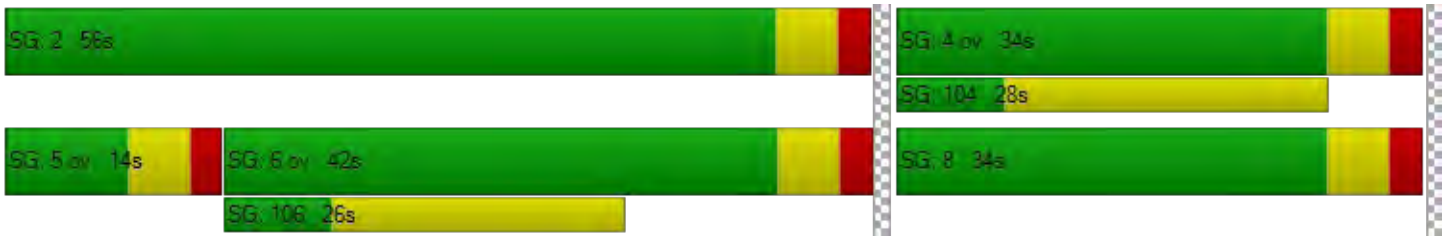
d_M, Delay for Movement [s/veh]	39.85	10.84	35.73	3.81	32.87	19.55
Movement LOS	D	B	D	A	C	B
d_A, Approach Delay [s/veh]	13.10		29.91		28.91	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	24.75					
Intersection LOS	C					
Intersection V/C	0.685					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	4.039	0.000	2.858
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
l_b,int, Bicycle LOS Score for Intersection	4.993	5.577	4.132
Bicycle LOS	E	F	D

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	19.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	3.00	20.00	8.00	2.00	5.00	7.00	1.00	12.00	1.00	1.00	13.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	1175	11	15	2457	234	202	3	59	24	1	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	319	3	4	668	64	55	1	16	7	0	13
Total Analysis Volume [veh/h]	58	1277	12	16	2671	254	220	3	64	26	1	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	63	73	11	11	21	0	15	25	0	11	21	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	6	80	89	2	77	77	9	10	10	19	4	13
g / C, Green / Cycle	0.05	0.67	0.74	0.02	0.64	0.64	0.08	0.08	0.08	0.16	0.03	0.10
(v / s)_i Volume / Saturation Flow Rate	0.04	0.25	0.01	0.01	0.52	0.16	0.07	0.00	0.04	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1509	5053	1360	1695	5094	1551	3320	1885	1602	1507	1885	1449
c, Capacity [veh/h]	73	3389	1013	34	3273	997	249	160	136	280	65	151
d1, Uniform Delay [s]	56.52	8.71	3.94	58.16	16.12	9.17	54.98	50.31	52.32	43.12	55.99	49.85
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.49	0.32	0.02	9.66	2.37	0.62	9.96	0.05	2.50	0.14	0.09	1.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.38	0.01	0.47	0.82	0.25	0.88	0.02	0.47	0.09	0.02	0.33
d, Delay for Lane Group [s/veh]	74.01	9.03	3.96	67.82	18.50	9.79	64.94	50.35	54.82	43.26	56.09	51.11
Lane Group LOS	E	A	A	E	B	A	E	D	D	D	E	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.04	4.20	0.06	0.56	15.93	2.64	3.63	0.08	1.93	0.67	0.03	1.45
50th-Percentile Queue Length [m/ln]	15.55	32.00	0.48	4.25	121.36	20.10	27.67	0.65	14.73	5.13	0.24	11.03
95th-Percentile Queue Length [veh/ln]	3.67	7.56	0.11	1.00	22.47	4.75	6.54	0.15	3.48	1.21	0.06	2.61
95th-Percentile Queue Length [m/ln]	27.98	57.60	0.87	7.66	171.23	36.19	49.81	1.16	26.51	9.23	0.42	19.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	74.01	9.03	3.96	67.82	18.50	9.79	64.94	50.35	54.82	43.26	56.09	51.11
Movement LOS	E	A	A	E	B	A	E	D	D	D	E	D
d_A, Approach Delay [s/veh]	11.78			18.01			62.53			48.53		
Approach LOS	B			B			E			D		
d_I, Intersection Delay [s/veh]	19.46											
Intersection LOS	B											
Intersection V/C	0.662											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34	51.34
l_p,int, Pedestrian LOS Score for Intersection	4.080	4.015	2.758	2.350
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1117	250	317	250
d_b, Bicycle Delay [s]	11.70	45.94	42.50	45.94
l_b,int, Bicycle LOS Score for Intersection	2.300	3.177	1.796	1.687
Bicycle LOS	B	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	Two-way stop	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.190

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	30.00	3.00	10.00	1.00	1.00	25.00	2.00	1.00	2.00	9.00	21.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	11	99	55	17	16	4	125	16	88	164	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	27	15	5	4	1	34	4	24	45	6
Total Analysis Volume [veh/h]	8	12	108	60	18	17	4	136	17	96	178	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.04	0.00	0.00	0.01	0.23	0.02	0.19	0.29	0.02
d_M, Delay for Movement [s/veh]	7.44	0.00	0.00	7.65	0.00	0.00	15.41	13.01	10.39	17.69	16.38	8.90
Movement LOS	A	A	A	A	A	A	C	B	B	C	C	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.13	0.13	0.13	1.00	1.00	1.00	2.56	2.56	0.07
95th-Percentile Queue Length [m/ln]	0.12	0.12	0.12	1.01	1.01	1.01	7.64	7.64	7.64	19.50	19.50	0.57
d_A, Approach Delay [s/veh]	0.46			4.83			12.79			16.22		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	10.85											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	79.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.260

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	23	8	1325	1050	5
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	6	2	341	271	1
Total Analysis Volume [veh/h]	15	24	8	1366	1082	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.26	0.05	0.02	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	79.67	24.93	12.31	0.00	0.00	0.00
Movement LOS	F	C	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.21	1.21	0.05	0.02	0.00	0.00
95th-Percentile Queue Length [m/ln]	9.24	9.24	0.37	0.19	0.00	0.00
d_A, Approach Delay [s/veh]	45.99		0.07		0.00	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	0.76					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	338.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	12	0	9	5	1275	0	0	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	58.00	33.00	2.00	60.00	3.00	2.00	2.00	3.00	56.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	13	0	10	5	1386	0	0	1099	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.8600	0.8600	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	4	0	3	1	377	0	0	299	3
Total Analysis Volume [veh/h]	0	0	0	14	0	11	5	1507	0	0	1195	11
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.73	0.00	0.02	0.01	0.02	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	135.39	186.81	15.23	337.98	441.03	158.22	15.89	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	C	F	F	F	C	A			A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	2.60	2.60	2.60	0.05	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	19.80	19.80	19.80	0.35	0.17	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	112.47			258.89			0.05			0.00		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	2.39											
Intersection LOS	F											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.429

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	4.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	1137	747	0	0	235
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	309	203	0	0	64
Total Analysis Volume [veh/h]	283	1236	812	0	0	255
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.35	0.01	0.01	0.00	0.00	0.43
d_M, Delay for Movement [s/veh]	11.89	0.00	0.00	0.00	0.00	15.53
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	1.59	0.80	0.00	0.00	0.00	2.15
95th-Percentile Queue Length [m/ln]	12.13	6.06	0.00	0.00	0.00	16.35
d_A, Approach Delay [s/veh]	2.22		0.00		15.53	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.83					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	1.00	1.00	4.00	4.00	4.00	14.00	8.00	11.00	7.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	897	237	3	597	30	150	93	28	62	190	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	244	64	1	162	8	41	25	8	17	52	0
Total Analysis Volume [veh/h]	3	975	258	3	649	33	163	101	30	67	207	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			0			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			0			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	43	0	0	43	0	0	37	0	0	37	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	37	37	37	37	31	31	31
g / C, Green / Cycle	0.46	0.46	0.46	0.46	0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.36	0.36	0.20	0.20	0.29	0.06	0.12
s, saturation flow rate [veh/h]	1853	1563	1831	1645	1001	1168	1795
c, Capacity [veh/h]	902	723	892	761	458	175	696
d1, Uniform Delay [s]	18.07	18.14	14.37	14.39	24.19	16.73	16.96
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.47	8.36	1.36	1.75	6.77	6.24	1.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.78	0.40	0.43	0.64	0.38	0.30
d, Delay for Lane Group [s/veh]	23.54	26.50	15.74	16.14	30.95	22.97	18.06
Lane Group LOS	C	C	B	B	C	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	10.50	9.45	4.25	3.90	5.52	1.08	2.64
50th-Percentile Queue Length [m/ln]	80.04	72.00	32.42	29.68	42.07	8.23	20.15
95th-Percentile Queue Length [veh/ln]	15.82	14.49	7.64	7.01	9.37	1.94	4.76
95th-Percentile Queue Length [m/ln]	120.54	110.41	58.20	53.43	71.43	14.81	36.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.54	24.48	26.50	15.74	15.92	16.14	30.95	30.95	30.95	22.97	18.06	18.06
Movement LOS	C	C	C	B	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	24.90			15.93			30.95			19.26		
Approach LOS	C			B			C			B		
d_I, Intersection Delay [s/veh]	22.52											
Intersection LOS	C											
Intersection V/C	0.657											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.355	3.076	0.000	0.000
Crosswalk LOS	C	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	925	925	775	775
d_b, Bicycle Delay [s]	11.56	11.56	15.01	15.01
l_b,int, Bicycle LOS Score for Intersection	2.579	2.125	2.045	2.012
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.248

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	4.00	2.00	9.00	2.00	38.00	1.00	20.00	6.00	1.00	3.00	9.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	235	0	47	188	17	0	92	35	24	207	47
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	64	0	13	51	5	0	25	10	7	56	13
Total Analysis Volume [veh/h]	27	255	0	51	204	18	0	100	38	26	225	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	34	0	0	34	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	20	20	20
g / C, Green / Cycle	0.47	0.47	0.47	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.02	0.09	0.09	0.09
s, saturation flow rate [veh/h]	1792	1712	1130	1526	1776	1587
c, Capacity [veh/h]	902	871	527	569	662	529
d1, Uniform Delay [s]	10.08	9.88	8.67	14.66	14.59	14.64
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.91	0.85	0.12	1.01	0.87	1.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.29	0.03	0.24	0.24	0.27
d, Delay for Lane Group [s/veh]	10.98	10.73	8.79	15.67	15.46	15.88
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.12	1.88	0.12	1.36	1.54	1.41
50th-Percentile Queue Length [m/ln]	16.13	14.34	0.93	10.35	11.77	10.76
95th-Percentile Queue Length [veh/ln]	3.81	3.39	0.22	2.44	2.78	2.54
95th-Percentile Queue Length [m/ln]	29.03	25.81	1.67	18.63	21.18	19.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.98	10.98	0.00	10.73	10.73	8.79	15.67	15.67	15.67	15.46	15.63	15.88
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	10.98			10.61			15.67			15.66		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	12.95											
Intersection LOS	B											
Intersection V/C	0.248											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	933	667	667
d_b, Bicycle Delay [s]	8.53	8.53	13.33	13.33
l_b,int, Bicycle LOS Score for Intersection	2.025	2.010	1.787	1.809
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.711

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	1	0	0	2	0	0	0
Pocket Length [m]	150.00	30.48	30.48	30.00	30.48	100.00	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	1	990	783	1	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	5.00	5.00	1.00	2.00	1.00	2.00	1.00	1.00	2.00	7.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	332	436	70	82	858	93	1	1076	851	1	921	108
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.8500	0.9200	0.9200	0.8500	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	118	19	22	233	25	0	292	231	0	250	29
Total Analysis Volume [veh/h]	361	474	76	89	933	101	1	1170	925	1	1001	117
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			1		
v_co, Outbound Pedestrian Volume crossing	0			0			5			8		
v_ci, Inbound Pedestrian Volume crossing mi	8			5			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	1	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Split [s]	11	26	0	14	29	0	0	30	11	0	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	C	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	20	38	38	5	22	22	27	36	27	27
g / C, Green / Cycle	0.28	0.54	0.54	0.07	0.32	0.32	0.39	0.51	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.15	0.05	0.28	0.28	0.33	0.33	0.30	0.31
s, saturation flow rate [veh/h]	3486	1855	1767	1738	1885	1821	3560	2835	1870	1803
c, Capacity [veh/h]	986	992	945	120	606	585	1387	1438	729	703
d1, Uniform Delay [s]	20.09	8.93	8.93	31.95	22.36	22.36	19.42	12.61	18.60	18.90
k, delay calibration	0.11	0.11	0.11	0.11	0.17	0.17	0.11	0.11	0.20	0.22
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	0.16	0.16	8.51	5.90	6.14	1.48	0.49	3.14	4.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.28	0.28	0.74	0.87	0.87	0.84	0.64	0.77	0.80
d, Delay for Lane Group [s/veh]	20.31	9.09	9.10	40.46	28.26	28.50	20.90	13.10	21.74	23.02
Lane Group LOS	C	A	A	D	C	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.19	1.97	1.88	1.68	8.27	8.04	7.82	4.47	7.53	7.81
50th-Percentile Queue Length [m/ln]	16.70	15.02	14.32	12.82	63.03	61.24	59.55	34.04	57.35	59.49
95th-Percentile Queue Length [veh/ln]	3.94	3.55	3.38	3.03	12.99	12.69	12.40	7.93	12.03	12.39
95th-Percentile Queue Length [m/ln]	30.06	27.03	25.78	23.08	98.97	96.67	94.49	60.45	91.64	94.41

Movement, Approach, & Intersection Results

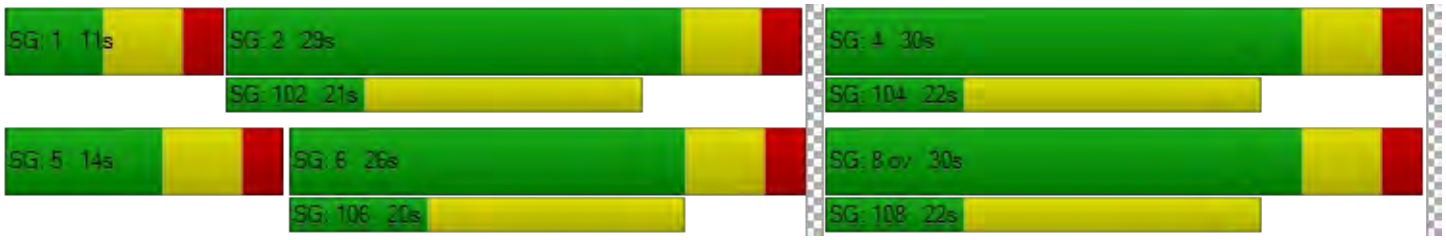
d_M, Delay for Movement [s/veh]	20.31	9.09	9.10	40.46	28.36	28.50	0.00	20.90	13.10	0.00	22.31	23.02
Movement LOS	C	A	A	D	C	C		C	B		C	C
d_A, Approach Delay [s/veh]	13.54			29.33			17.46			22.38		
Approach LOS	B			C			B			C		
d_I, Intersection Delay [s/veh]	20.37											
Intersection LOS	C											
Intersection V/C	0.711											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	24.86	24.86
l_p,int, Pedestrian LOS Score for Intersection	3.222	2.918	3.390	3.094
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	571	657	686	686
d_b, Bicycle Delay [s]	17.86	15.78	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	2.311	2.486	3.288	2.482
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190719_2025_AM_Scenarios_Market_Lands.vistro
Scenario 1 1 AM Peak - 2025 - no mitig. - partial
Report File: V:\...\2025 Partial BO No Mitig - AM.pdf
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.913	71.1	E
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.837	39.7	D
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.326	10.1	B
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.438	267.6	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	NB Left	3.414	1,359.3	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.448	21.8	C
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Thru	0.774	26.7	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NWB Thru	0.369	14.0	B
19	Archibald & Marion	Signalized	HCM 6th Edition	WB Right	0.977	89.2	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	71.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.913

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	71	0	0	59	33	34
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	594	1517	1484	674	581	98
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	161	412	403	183	158	27
Total Analysis Volume [veh/h]	646	1649	1613	733	632	107
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	33	88	55	32	32	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	82	82	49	81	26	26
g / C, Green / Cycle	0.68	0.68	0.41	0.68	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.74	0.47	0.47	0.46	0.23	0.23
s, saturation flow rate [veh/h]	875	3503	3418	1589	1709	1468
c, Capacity [veh/h]	558	2394	1395	1073	370	318
d1, Uniform Delay [s]	41.93	11.37	35.50	11.76	47.00	47.00
k, delay calibration	0.50	0.50	0.50	0.50	0.36	0.36
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	90.00	1.65	78.67	3.53	59.08	65.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.16	0.69	1.16	0.68	1.07	1.08
d, Delay for Lane Group [s/veh]	131.93	13.01	114.17	15.29	106.08	112.73
Lane Group LOS	F	B	F	B	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	19.42	11.10	34.05	10.65	17.04	15.22
50th-Percentile Queue Length [m/ln]	148.00	84.60	259.45	81.13	129.83	116.01
95th-Percentile Queue Length [veh/ln]	29.79	16.57	48.20	16.00	24.70	22.53
95th-Percentile Queue Length [m/ln]	227.02	126.24	367.30	121.91	188.19	171.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	131.93	13.01	114.17	15.29	108.61	112.73
Movement LOS	F	B	F	B	F	F
d_A, Approach Delay [s/veh]	46.48		83.27		109.17	
Approach LOS	D		F		F	
d_I, Intersection Delay [s/veh]	71.14					
Intersection LOS	E					
Intersection V/C	0.913					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	0.00	49.50
l_p,int, Pedestrian LOS Score for Intersection	4.401	0.000	3.396
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
l_b,int, Bicycle LOS Score for Intersection	6.026	6.068	5.352
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	39.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.837

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	0	27	29	50	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	2074	37	84	1266	226	341	26	22	33	2	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	564	10	23	344	61	93	7	6	9	1	20
Total Analysis Volume [veh/h]	64	2254	40	91	1376	246	371	28	24	36	2	79
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	73	96	11	16	39	0	23	27	0	11	15	16
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	7	95	105	9	97	97	17	18	18	28	5	20
g / C, Green / Cycle	0.05	0.63	0.70	0.06	0.65	0.65	0.11	0.12	0.12	0.19	0.03	0.13
(v / s)_i Volume / Saturation Flow Rate	0.04	0.63	0.03	0.05	0.39	0.15	0.11	0.01	0.02	0.02	0.00	0.05
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	3459	1870	1595	1474	1870	1589
c, Capacity [veh/h]	85	2250	1109	111	2303	1028	392	224	191	327	60	214
d1, Uniform Delay [s]	70.58	27.61	7.03	69.47	15.24	11.06	66.05	58.98	59.03	50.78	70.31	59.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.81	19.42	0.06	13.46	1.15	0.55	11.78	0.24	0.30	0.15	0.22	1.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	1.00	0.04	0.82	0.60	0.24	0.95	0.12	0.13	0.11	0.03	0.37
d, Delay for Lane Group [s/veh]	83.39	47.03	7.09	82.93	16.40	11.61	77.83	59.23	59.33	50.93	70.53	60.14
Lane Group LOS	F	F	A	F	B	B	E	E	E	D	E	E
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.69	41.38	0.38	3.80	12.60	3.33	7.71	0.95	0.86	1.15	0.08	2.82
50th-Percentile Queue Length [m/ln]	20.47	315.33	2.90	28.95	96.00	25.38	58.74	7.28	6.54	8.78	0.60	21.46
95th-Percentile Queue Length [veh/ln]	4.84	52.02	0.68	6.84	18.42	6.00	12.26	1.72	1.54	2.07	0.14	5.07
95th-Percentile Queue Length [m/ln]	36.85	396.42	5.22	52.12	140.36	45.69	93.44	13.10	11.76	15.81	1.08	38.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	83.39	47.03	7.09	82.93	16.40	11.61	77.83	59.23	59.33	50.93	70.53	60.14
Movement LOS	F	F	A	F	B	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	47.34			19.24			75.55			57.48		
Approach LOS	D			B			E			E		
d_I, Intersection Delay [s/veh]	39.75											
Intersection LOS	D											
Intersection V/C	0.837											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.128	4.089	2.788	2.414
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	440	280	120
d_b, Bicycle Delay [s]	12.00	45.63	55.47	66.27
l_b,int, Bicycle LOS Score for Intersection	3.505	2.973	1.909	1.753
Bicycle LOS	D	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.326

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	25	0	0	0	0	25	0	14	15	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	17	189	36	5	9	23	159	9	89	98	95
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	51	10	1	2	6	43	2	24	27	26
Total Analysis Volume [veh/h]	4	18	205	39	5	10	25	173	10	97	107	103
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	755	641	695	626	750
Degree of Utilization, x	0.30	0.08	0.30	0.33	0.14

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.27	0.28	1.26	1.41	0.48
95th-Percentile Queue Length [m]	9.65	2.10	9.57	10.76	3.62
Approach Delay [s/veh]	9.81	9.14	10.38	10.22	
Approach LOS	A	A	B	B	
Intersection Delay [s/veh]	10.07				
Intersection LOS	B				

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Version 7.00-03

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	267.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.438

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	123	102	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	8	34	1162	1254	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	9	316	341	7
Total Analysis Volume [veh/h]	8	9	37	1263	1363	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.44	0.02	0.07	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	267.63	79.97	12.88	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.57	1.57	0.24	0.12	0.00	0.00
95th-Percentile Queue Length [m/ln]	11.97	11.97	1.84	0.92	0.00	0.00
d_A, Approach Delay [s/veh]	168.28		0.37		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.23					
Intersection LOS	F					

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Intersection Level Of Service Report

Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	1,359.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.414

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	30.48	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	11	0	11	15	915	0	0	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	95	0	61	0	0	0	0	3	116	71	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	0	61	12	0	12	16	998	116	71	1187	17
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	17	3	0	3	4	271	32	19	323	5
Total Analysis Volume [veh/h]	103	0	66	13	0	13	17	1085	126	77	1290	18
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	3.41	0.00	0.15	0.99	0.00	0.05	0.04	0.01	0.00	0.13	0.01	0.00
d_M, Delay for Movement [s/veh]	1359.29	196.12	14.61	549.90	480.63	288.60	14.18	0.00	0.00	12.27	0.00	0.00
Movement LOS	F	F	B	F	F	F	B	A	A	B	A	A
95th-Percentile Queue Length [veh/ln]	12.26	0.52	0.52	3.19	3.19	3.19	0.13	0.00	0.00	0.46	0.00	0.00
95th-Percentile Queue Length [m/ln]	93.39	3.99	3.99	24.30	24.30	24.30	0.99	0.00	0.00	3.53	0.00	0.00
d_A, Approach Delay [s/veh]	834.15			419.25			0.20			0.68		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	54.51											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.448

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	89	133	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	831	1300	1	0	159
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	223	349	0	0	43
Total Analysis Volume [veh/h]	272	894	1398	1	0	171
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.56	0.01	0.01	0.00	0.00	0.45
d_M, Delay for Movement [s/veh]	21.53	0.00	0.00	0.00	0.00	21.84
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	3.41	1.70	0.00	0.00	0.00	2.24
95th-Percentile Queue Length [m/ln]	25.95	12.97	0.00	0.00	0.00	17.07
d_A, Approach Delay [s/veh]	5.02		0.00		21.84	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	C					

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Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	67	22	0	130	0	3	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	633	190	1	1058	108	242	247	5	8	96	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	172	52	0	288	29	66	67	1	2	26	0
Total Analysis Volume [veh/h]	9	688	207	1	1150	117	263	268	5	9	104	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	31	0	0	31	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	25	25	25	25	23	23	23
g / C, Green / Cycle	0.42	0.42	0.42	0.42	0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.29	0.29	0.36	0.36	0.41	0.01	0.06
s, saturation flow rate [veh/h]	1515	1577	1869	1645	1299	1106	1867
c, Capacity [veh/h]	692	657	839	685	587	120	716
d1, Uniform Delay [s]	13.61	14.42	15.96	15.99	20.81	11.60	12.09
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.50	6.15	8.02	13.93	20.93	1.21	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.64	0.70	0.80	0.87	0.91	0.07	0.15
d, Delay for Lane Group [s/veh]	18.11	20.57	23.97	29.92	41.73	12.81	12.52
Lane Group LOS	B	C	C	C	D	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.65	5.36	8.72	8.71	10.04	0.11	0.87
50th-Percentile Queue Length [m/ln]	35.42	40.83	66.45	66.37	76.49	0.80	6.64
95th-Percentile Queue Length [veh/ln]	8.18	9.15	13.56	13.55	15.23	0.19	1.57
95th-Percentile Queue Length [m/ln]	62.36	69.75	103.35	103.25	116.08	1.44	11.96

Movement, Approach, & Intersection Results

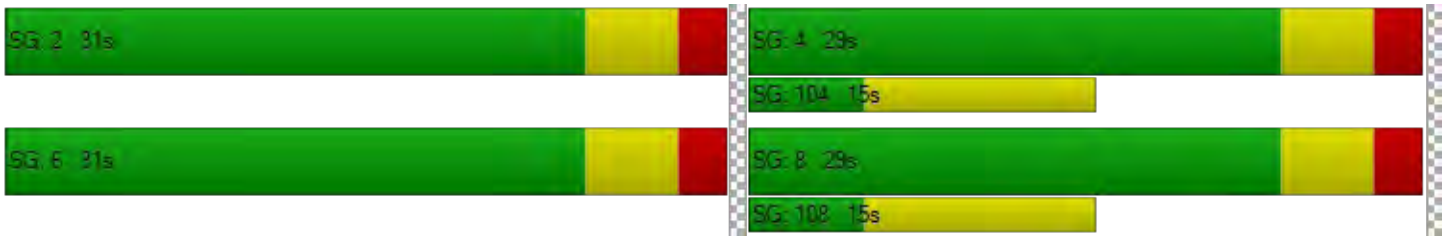
d_M, Delay for Movement [s/veh]	18.11	19.02	20.57	23.97	26.44	29.92	41.73	41.73	41.73	12.81	12.52	12.52
Movement LOS	B	B	C	C	C	C	D	D	D	B	B	B
d_A, Approach Delay [s/veh]	19.37			26.76			41.73			12.54		
Approach LOS	B			C			D			B		
d_I, Intersection Delay [s/veh]	26.66											
Intersection LOS	C											
Intersection V/C	0.774											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.68	21.68	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.616	3.085	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	833	833	767	767
d_b, Bicycle Delay [s]	10.21	10.21	11.41	11.41
l_b,int, Bicycle LOS Score for Intersection	2.305	2.606	2.444	1.748
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.369

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	209	0	34	102	21	1	321	40	5	70	55
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	57	0	9	28	6	0	87	11	1	19	15
Total Analysis Volume [veh/h]	49	227	0	37	111	23	1	349	43	5	76	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	29	0	0	29	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	23	23	25	25	25
g / C, Green / Cycle	0.38	0.38	0.38	0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.16	0.09	0.01	0.21	0.04	0.04
s, saturation flow rate [veh/h]	1780	1708	1589	1834	1833	1465
c, Capacity [veh/h]	753	730	609	824	828	611
d1, Uniform Delay [s]	13.38	12.39	11.58	12.99	10.64	10.69
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.38	0.63	0.12	1.97	0.22	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.20	0.04	0.48	0.09	0.11
d, Delay for Lane Group [s/veh]	14.76	13.02	11.69	14.96	10.85	11.04
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.58	1.26	0.18	3.71	0.56	0.51
50th-Percentile Queue Length [m/ln]	19.62	9.62	1.41	28.24	4.27	3.87
95th-Percentile Queue Length [veh/ln]	4.64	2.27	0.33	6.67	1.01	0.91
95th-Percentile Queue Length [m/ln]	35.32	17.31	2.53	50.84	7.69	6.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.76	14.76	0.00	13.02	13.02	11.69	14.96	14.96	14.96	10.85	10.87	11.04
Movement LOS	B	B		B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	14.76			12.84			14.96			10.94		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.96											
Intersection LOS	B											
Intersection V/C	0.369											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	767	767	833	833
d_b, Bicycle Delay [s]	11.41	11.41	10.21	10.21
l_b,int, Bicycle LOS Score for Intersection	2.015	1.842	2.208	1.676
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	89.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.977

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	49	26	0	0	0	48	0	0	80	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	871	826	116	98	271	89	2	842	292	3	1004	110
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	237	224	32	27	74	24	1	229	79	1	273	30
Total Analysis Volume [veh/h]	947	898	126	107	295	97	2	915	317	3	1091	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	72	77	0	15	20	0	0	48	0	0	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	66	72	9	15	15	43	43	43	43
g / C, Green / Cycle	0.47	0.51	0.06	0.11	0.11	0.31	0.31	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.53	0.56	0.06	0.11	0.11	0.26	0.20	0.32	0.34
s, saturation flow rate [veh/h]	1781	1830	1781	1870	1715	3560	1589	1870	1807
c, Capacity [veh/h]	840	941	114	200	184	1094	488	574	555
d1, Uniform Delay [s]	37.00	34.00	65.21	62.50	62.50	45.23	41.97	48.50	48.50
k, delay calibration	0.50	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	72.57	56.21	25.84	32.25	39.11	7.64	6.55	52.65	65.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.13	1.09	0.93	1.01	1.03	0.84	0.65	1.05	1.09
d, Delay for Lane Group [s/veh]	109.57	90.21	91.05	94.75	101.61	52.87	48.53	101.15	113.86
Lane Group LOS	F	F	F	F	F	D	D	F	F
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	44.47	45.07	4.60	8.87	8.48	15.77	10.29	28.07	29.08
50th-Percentile Queue Length [m/ln]	338.86	343.45	35.04	67.55	64.62	120.18	78.37	213.90	221.61
95th-Percentile Queue Length [veh/ln]	60.70	60.02	8.12	13.81	13.42	22.29	15.54	38.08	40.14
95th-Percentile Queue Length [m/ln]	462.52	457.39	61.84	105.23	102.28	169.81	118.45	290.17	305.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	109.57	90.21	90.21	91.05	96.90	101.61	0.00	52.87	48.53	0.00	106.80	113.86
Movement LOS	F	F	F	F	F	F		D	D		F	F
d_A, Approach Delay [s/veh]	99.51			96.56			51.75			107.50		
Approach LOS	F			F			D			F		
d_I, Intersection Delay [s/veh]	89.21											
Intersection LOS	F											
Intersection V/C	0.977											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	59.43	59.43	59.43
l_p,int, Pedestrian LOS Score for Intersection	3.170	2.830	3.374	3.099
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1029	214	614	614
d_b, Bicycle Delay [s]	16.51	55.80	33.60	33.60
l_b,int, Bicycle LOS Score for Intersection	4.812	1.971	2.576	2.559
Bicycle LOS	E	A	B	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190719_2025_PM_Scenarios_Market_Lands.vistro
Report File: V:\...\2025 Partial BO no Mitig - PM.pdf

Scenario 1 1 PM Peak - 2025 - no mitig. - partial
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	1.054	91.2	F
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	SB Thru	0.911	60.6	E
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.554	12.1	B
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.513	166.0	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	NB Left	16.554	7,776.5	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.464	17.1	C
15	Dawson & Marion	Signalized	HCM 6th Edition	SEB Left	0.730	20.7	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.247	12.9	B
17	Marion & Turenne	Two-way stop	HCM 6th Edition	SB Left	0.008	32.4	D
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	1.061	87.2	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	91.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.054

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	3.00	2.00	2.00	1.00	3.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	71	0	0	33	69	92
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	183	1328	1975	474	792	397
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	361	537	129	215	108
Total Analysis Volume [veh/h]	199	1443	2147	515	861	432
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	11	87	76	53	53	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	81	81	70	123	47	47
g / C, Green / Cycle	0.58	0.58	0.50	0.88	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.59	0.41	0.60	0.32	0.36	0.39
s, saturation flow rate [veh/h]	337	3532	3560	1589	1795	1634
c, Capacity [veh/h]	183	2043	1780	1396	603	549
d1, Uniform Delay [s]	56.88	21.02	35.00	1.53	46.50	46.50
k, delay calibration	0.50	0.50	0.50	0.41	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	91.57	2.08	98.30	0.62	60.49	94.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.09	0.71	1.21	0.37	1.08	1.17
d, Delay for Lane Group [s/veh]	148.45	23.10	133.30	2.15	106.99	140.86
Lane Group LOS	F	C	F	A	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.25	15.97	52.19	0.96	30.90	33.29
50th-Percentile Queue Length [m/ln]	55.28	121.72	397.70	7.31	235.48	253.68
95th-Percentile Queue Length [veh/ln]	12.32	22.53	73.51	1.73	42.21	47.25
95th-Percentile Queue Length [m/ln]	93.90	171.67	560.17	13.16	321.61	360.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	148.45	23.10	133.30	2.15	115.32	140.86
Movement LOS	F	C	F	A	F	F
d_A, Approach Delay [s/veh]	38.30		107.92		123.79	
Approach LOS	D		F		F	
d_I, Intersection Delay [s/veh]	91.16					
Intersection LOS	F					
Intersection V/C	1.054					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	0.00	59.43
I_p,int, Pedestrian LOS Score for Intersection	4.516	0.000	3.113
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	70.00	70.00	70.00
I_b,int, Bicycle LOS Score for Intersection	5.487	6.329	6.266
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	60.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.911

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	27	0	0	66	74	46	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	1202	11	15	2523	308	248	3	59	24	1	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	327	3	4	686	84	67	1	16	7	0	13
Total Analysis Volume [veh/h]	58	1307	12	16	2742	335	270	3	64	26	1	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	13	104	11	12	103	0	19	23	0	11	15	12
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
l2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	6	105	115	3	102	102	13	14	14	23	4	14
g / C, Green / Cycle	0.04	0.70	0.76	0.02	0.68	0.68	0.09	0.09	0.09	0.16	0.03	0.09
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.01	0.01	0.77	0.21	0.08	0.00	0.04	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1781	3532	1589	1781	3560	1589	3459	1870	1589	1474	1870	1589
c, Capacity [veh/h]	74	2481	1215	38	2428	1084	300	176	150	253	56	145
d1, Uniform Delay [s]	71.21	10.54	4.19	72.52	23.86	9.62	67.86	61.62	64.11	54.26	70.63	63.99
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.23	0.80	0.01	7.46	64.10	0.74	9.68	0.04	1.92	0.18	0.13	1.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.53	0.01	0.43	1.13	0.31	0.90	0.02	0.43	0.10	0.02	0.35
d, Delay for Lane Group [s/veh]	87.43	11.35	4.20	79.99	87.96	10.36	77.54	61.66	66.03	54.43	70.76	65.41
Lane Group LOS	F	B	A	E	F	B	E	E	E	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.50	9.20	0.08	0.68	57.73	4.24	5.55	0.11	2.40	0.86	0.04	1.86
50th-Percentile Queue Length [m/ln]	19.06	70.14	0.59	5.15	439.90	32.31	42.26	0.81	18.30	6.57	0.30	14.19
95th-Percentile Queue Length [veh/ln]	4.50	14.18	0.14	1.22	78.03	7.62	9.41	0.19	4.32	1.55	0.07	3.35
95th-Percentile Queue Length [m/ln]	34.31	108.05	1.07	9.26	594.58	58.04	71.69	1.46	32.94	11.83	0.54	25.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	87.43	11.35	4.20	79.99	87.96	10.36	77.54	61.66	66.03	54.43	70.76	65.41
Movement LOS	F	B	A	E	F	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	14.49			79.51			75.21			61.77		
Approach LOS	B			E			E			E		
d_I, Intersection Delay [s/veh]	60.60											
Intersection LOS	E											
Intersection V/C	0.911											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.305	4.186	2.788	2.359
Crosswalk LOS	E	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1307	1293	227	120
d_b, Bicycle Delay [s]	9.01	9.36	58.96	66.27
l_b,int, Bicycle LOS Score for Intersection	2.696	4.111	1.838	1.687
Bicycle LOS	B	D	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	23	0	0	0	0	23	0	37	37	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	11	122	55	17	16	4	148	16	125	201	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	33	15	5	4	1	40	4	34	55	6
Total Analysis Volume [veh/h]	8	12	133	60	18	17	4	161	17	136	218	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	707	630	687	639	761
Degree of Utilization, x	0.22	0.15	0.26	0.55	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.82	0.53	1.06	3.40	0.09
95th-Percentile Queue Length [m]	6.24	4.03	8.10	25.89	0.71
Approach Delay [s/veh]	9.49	9.73	10.12	14.63	
Approach LOS	A	A	B	B	
Intersection Delay [s/veh]	12.06				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	166.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.513

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	147	137	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	23	8	1472	1187	6
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	6	2	400	323	2
Total Analysis Volume [veh/h]	17	25	9	1600	1290	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.51	0.06	0.02	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	166.03	66.21	14.08	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	2.48	2.48	0.07	0.03	0.00	0.00
95th-Percentile Queue Length [m/ln]	18.87	18.87	0.52	0.26	0.00	0.00
d_A, Approach Delay [s/veh]	106.61		0.08		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.56					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	7,776.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	16.554

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	30.48	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	12	0	9	5	1275	0	0	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	58.00	33.00	2.00	60.00	3.00	2.00	2.00	3.00	56.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	123	0	114	0	1	0	1	18	131	88	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	20	0	7	0	0	0	0	10	12	22	-22	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	143	0	121	13	1	10	6	1414	143	110	1085	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	0	33	4	0	3	2	384	39	30	295	3
Total Analysis Volume [veh/h]	155	0	132	14	1	11	7	1537	155	120	1179	11
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	16.55	0.00	0.43	2.80	0.24	0.02	0.02	0.02	0.00	0.32	0.01	0.00
d_M, Delay for Movement [s/veh]	7776.49	457.10	25.43	2083.80	2218.70	1371.63	15.75	0.00	0.00	19.15	0.00	0.00
Movement LOS	F	F	D	F	F	F	C	A	A	C	A	A
95th-Percentile Queue Length [veh/ln]	20.98	2.08	2.08	4.40	4.40	4.40	0.06	0.00	0.00	1.36	0.00	0.00
95th-Percentile Queue Length [m/ln]	159.83	15.85	15.85	33.55	33.55	33.55	0.48	0.00	0.00	10.39	0.00	0.00
d_A, Approach Delay [s/veh]	4211.54			1787.69			0.06			1.75		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	378.57											
Intersection LOS	F											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.464

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	1	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	210	106	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	262	1347	853	1	0	237
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	362	229	0	0	64
Total Analysis Volume [veh/h]	282	1448	917	1	0	255
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.38	0.01	0.01	0.00	0.00	0.46
d_M, Delay for Movement [s/veh]	12.85	0.00	0.00	0.00	0.00	17.12
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	1.80	0.90	0.00	0.00	0.00	2.44
95th-Percentile Queue Length [m/ln]	13.68	6.84	0.00	0.00	0.00	18.59
d_A, Approach Delay [s/veh]	2.09		0.00		17.12	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.75					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	20.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	161	48	0	104	0	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	1058	285	3	701	30	152	93	28	62	190	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	288	77	1	190	8	41	25	8	17	52	0
Total Analysis Volume [veh/h]	3	1150	310	3	762	33	165	101	30	67	207	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	43	0	0	43	0	0	27	0	0	27	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	37	37	37	37	21	21	21
g / C, Green / Cycle	0.53	0.53	0.53	0.53	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.42	0.43	0.23	0.23	0.30	0.05	0.11
s, saturation flow rate [veh/h]	1868	1574	1860	1676	984	1259	1870
c, Capacity [veh/h]	1039	832	1035	886	375	103	561
d1, Uniform Delay [s]	13.43	13.63	10.03	10.05	26.73	18.94	19.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.17	8.51	1.18	1.51	15.41	27.78	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.81	0.41	0.43	0.79	0.65	0.37
d, Delay for Lane Group [s/veh]	18.60	22.14	11.21	11.55	42.14	46.72	21.15
Lane Group LOS	B	C	B	B	D	D	C
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	9.58	9.02	3.56	3.28	6.16	1.56	2.71
50th-Percentile Queue Length [m/ln]	73.02	68.71	27.14	24.98	46.92	11.91	20.65
95th-Percentile Queue Length [veh/ln]	14.66	13.94	6.41	5.90	10.23	2.81	4.88
95th-Percentile Queue Length [m/ln]	111.70	106.23	48.85	44.96	77.92	21.44	37.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	18.60	19.73	22.14	11.21	11.37	11.55	42.14	42.14	42.14	46.72	21.15	21.15
Movement LOS	B	B	C	B	B	B	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	20.24			11.37			42.14			27.40		
Approach LOS	C			B			D			C		
d_I, Intersection Delay [s/veh]	20.72											
Intersection LOS	C											
Intersection V/C	0.730											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	26.58	26.58	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.520	3.212	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1057	1057	600	600
d_b, Bicycle Delay [s]	7.78	7.78	17.15	17.15
l_b,int, Bicycle LOS Score for Intersection	2.767	2.218	2.048	2.012
Bicycle LOS	C	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.247

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	1	0	0	1	0	0	0	0	0	0	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	236	0	47	189	17	0	92	35	24	207	48
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	64	0	13	51	5	0	25	10	7	56	13
Total Analysis Volume [veh/h]	28	257	0	51	205	18	0	100	38	26	225	52
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	0	0	35	0	0	25	0	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	19	19	19
g / C, Green / Cycle	0.48	0.48	0.48	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.01	0.08	0.09	0.09
s, saturation flow rate [veh/h]	1818	1709	1589	1783	1793	1598
c, Capacity [veh/h]	945	898	768	625	637	506
d1, Uniform Delay [s]	9.45	9.28	8.10	15.18	15.33	15.38
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.82	0.80	0.06	0.82	0.95	1.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.29	0.02	0.22	0.25	0.28
d, Delay for Lane Group [s/veh]	10.27	10.08	8.16	16.00	16.28	16.76
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.03	1.80	0.11	1.36	1.61	1.47
50th-Percentile Queue Length [m/ln]	15.47	13.71	0.84	10.39	12.25	11.20
95th-Percentile Queue Length [veh/ln]	3.65	3.24	0.20	2.46	2.89	2.64
95th-Percentile Queue Length [m/ln]	27.85	24.68	1.51	18.71	22.05	20.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.27	10.27	0.00	10.08	10.08	8.16	16.00	16.00	16.00	16.28	16.47	16.76
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	10.27			9.95			16.00			16.50		
Approach LOS	B			A			B			B		
d_I, Intersection Delay [s/veh]	12.86											
Intersection LOS	B											
Intersection V/C	0.247											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	633	633
d_b, Bicycle Delay [s]	8.01	8.01	14.01	14.01
l_b,int, Bicycle LOS Score for Intersection	2.030	2.012	1.787	1.810
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 17: Marion & Turenne

Control Type:	Two-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	Turenne St		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Turenne St		Marion St		Marion St	
Base Volume Input [veh/h]	1	1	1	927	545	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	161	104	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	1	1	1169	696	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	318	189	0
Total Analysis Volume [veh/h]	1	1	1	1271	757	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	32.41	10.97	9.25	0.00	0.00	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.03	0.03	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.21	0.21	0.03	0.01	0.00	0.00
d_A, Approach Delay [s/veh]	21.69		0.01		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.03					
Intersection LOS	D					

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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	87.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.061

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	2	990	783	3	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	36	15	0	0	0	96	0	0	73	64
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	332	436	106	97	858	93	2	1172	851	3	994	172
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	118	29	26	233	25	1	318	231	1	270	47
Total Analysis Volume [veh/h]	361	474	115	105	933	101	2	1274	925	3	1080	187
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	24	42	0	13	31	0	0	55	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	18	37	7	26	26	50	50	50	50
g / C, Green / Cycle	0.16	0.34	0.06	0.24	0.24	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.20	0.33	0.06	0.28	0.28	0.36	0.58	0.34	0.36
s, saturation flow rate [veh/h]	1781	1808	1781	1870	1807	3560	1602	1870	1777
c, Capacity [veh/h]	291	608	113	442	427	1618	728	850	808
d1, Uniform Delay [s]	46.00	35.93	51.24	42.00	42.00	25.48	30.00	24.75	25.43
k, delay calibration	0.23	0.42	0.11	0.45	0.45	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	120.58	26.56	24.74	104.05	105.10	3.95	132.23	5.89	7.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.24	0.97	0.93	1.19	1.19	0.79	1.27	0.75	0.78
d, Delay for Lane Group [s/veh]	166.58	62.49	75.99	146.05	147.10	29.43	162.23	30.64	32.94
Lane Group LOS	F	E	E	F	F	C	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	17.55	19.39	3.61	24.42	23.72	14.23	44.71	14.28	14.93
50th-Percentile Queue Length [m/ln]	133.70	147.79	27.53	186.08	180.72	108.45	340.70	108.81	113.75
95th-Percentile Queue Length [veh/ln]	26.89	26.62	6.50	35.75	34.86	20.42	65.40	20.48	21.26
95th-Percentile Queue Length [m/ln]	204.91	202.82	49.55	272.45	265.61	155.59	498.33	156.04	162.03

Movement, Approach, & Intersection Results

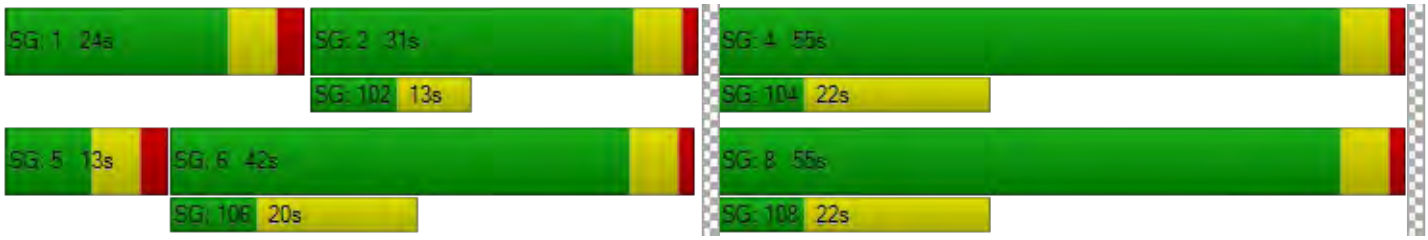
d_M, Delay for Movement [s/veh]	166.58	62.49	62.49	75.99	146.51	147.10	0.00	29.43	162.23	0.00	31.59	32.94
Movement LOS	F	E	E	E	F	F		C	F		C	C
d_A, Approach Delay [s/veh]	102.05			140.06			85.29			31.79		
Approach LOS	F			F			F			C		
d_I, Intersection Delay [s/veh]	87.18											
Intersection LOS	F											
Intersection V/C	1.061											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	3.230	2.909	3.458	3.215
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	673	473	909	909
d_b, Bicycle Delay [s]	24.22	32.07	16.36	16.36
l_b,int, Bicycle LOS Score for Intersection	3.127	2.499	3.374	2.605
Bicycle LOS	C	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Report File: V:\...\2025 Partial BO w Mitig - AM.pdf

Scenario 3 AM Peak - 2025 - mitig 1 - partial BO
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.713	25.8	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.646	23.7	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.326	10.1	B
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.438	267.6	F
13	Dupuy & Marion	Signalized	HCM 6th Edition	SB Left	0.516	13.3	B
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.448	21.8	C
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Thru	0.763	27.9	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NWB Thru	0.371	16.6	B
19	Archibald & Marion	Signalized	HCM 6th Edition	SB Left	0.719	30.7	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.713

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	71	0	0	59	33	34
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	594	1517	1484	674	581	98
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	161	412	403	183	158	27
Total Analysis Volume [veh/h]	646	1649	1613	733	632	107
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	4	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	34	78	44	32	32	32
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	No	No	No	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	23	72	43	75	26	55
g / C, Green / Cycle	0.21	0.65	0.39	0.68	0.24	0.50
(v / s)_i Volume / Saturation Flow Rate	0.19	0.32	0.32	0.46	0.18	0.07
s, saturation flow rate [veh/h]	3459	5094	5094	1589	3459	1589
c, Capacity [veh/h]	736	3334	1973	1078	817	800
d1, Uniform Delay [s]	41.92	9.71	30.21	10.57	39.24	14.53
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.58	0.53	3.90	3.46	1.60	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.49	0.82	0.68	0.77	0.13
d, Delay for Lane Group [s/veh]	45.50	10.23	34.11	14.03	40.84	14.61
Lane Group LOS	D	B	C	B	D	B
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.43	5.67	12.45	9.24	8.07	1.42
50th-Percentile Queue Length [m/ln]	64.22	43.21	94.89	70.43	61.49	10.84
95th-Percentile Queue Length [veh/ln]	13.19	9.58	18.24	14.23	12.73	2.56
95th-Percentile Queue Length [m/ln]	100.50	72.96	138.99	108.42	96.99	19.51

Movement, Approach, & Intersection Results

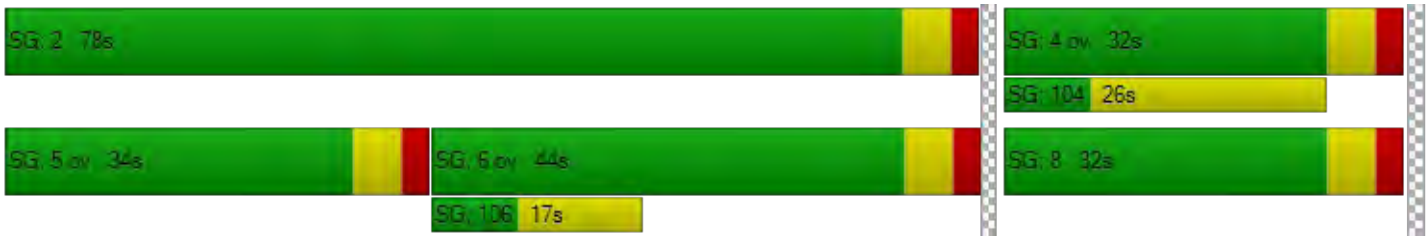
d_M, Delay for Movement [s/veh]	45.50	10.23	34.11	14.03	40.84	14.61
Movement LOS	D	B	C	B	D	B
d_A, Approach Delay [s/veh]	20.16		27.84		37.04	
Approach LOS	C		C		D	
d_I, Intersection Delay [s/veh]	25.83					
Intersection LOS	C					
Intersection V/C	0.713					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	0.00	44.55
l_p,int, Pedestrian LOS Score for Intersection	4.040	0.000	2.998
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	5.395	5.423	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	23.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.646

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	24	0	0	27	29	50	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	2074	37	84	1266	226	341	26	22	33	2	73
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	564	10	23	344	61	93	7	6	9	1	20
Total Analysis Volume [veh/h]	64	2254	40	91	1376	246	371	28	24	36	2	79
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	36	63	11	13	40	0	19	23	0	11	15	13
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	5	61	71	7	63	63	13	14	14	24	5	18
g / C, Green / Cycle	0.05	0.56	0.64	0.06	0.57	0.57	0.12	0.13	0.13	0.21	0.04	0.16
(v / s)_i Volume / Saturation Flow Rate	0.04	0.44	0.03	0.05	0.27	0.15	0.11	0.01	0.02	0.02	0.00	0.05
s, saturation flow rate [veh/h]	1781	5094	1589	1781	5094	1589	3459	1870	1595	1486	1870	1589
c, Capacity [veh/h]	86	2843	1022	113	2921	911	409	243	207	399	78	255
d1, Uniform Delay [s]	51.67	19.27	7.19	50.82	13.71	11.84	47.91	42.28	42.31	34.63	50.54	40.83
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.91	2.36	0.07	12.28	0.55	0.73	7.86	0.20	0.25	0.10	0.13	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.79	0.04	0.80	0.47	0.27	0.91	0.11	0.12	0.09	0.03	0.31
d, Delay for Lane Group [s/veh]	63.58	21.63	7.26	63.10	14.26	12.57	55.77	42.48	42.56	34.73	50.67	41.51
Lane Group LOS	E	C	A	E	B	B	E	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.97	13.72	0.31	2.77	5.95	2.87	5.44	0.67	0.60	0.78	0.06	1.94
50th-Percentile Queue Length [m/ln]	14.98	104.55	2.38	21.09	45.32	21.87	41.42	5.13	4.61	5.98	0.42	14.77
95th-Percentile Queue Length [veh/ln]	3.54	19.80	0.56	4.98	9.95	5.17	9.26	1.21	1.09	1.41	0.10	3.49
95th-Percentile Queue Length [m/ln]	26.96	150.85	4.29	37.97	75.80	39.37	70.56	9.23	8.30	10.76	0.76	26.59

Movement, Approach, & Intersection Results

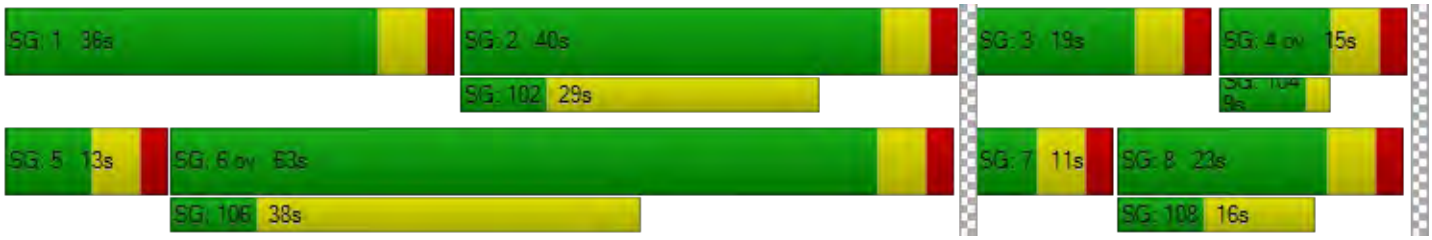
d_M, Delay for Movement [s/veh]	63.58	21.63	7.26	63.10	14.26	12.57	55.77	42.49	42.56	34.73	50.67	41.51
Movement LOS	E	C	A	E	B	B	E	D	D	C	D	D
d_A, Approach Delay [s/veh]	22.53			16.61			54.14			39.58		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	23.66											
Intersection LOS	C											
Intersection V/C	0.646											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	3.976	3.992	2.773	2.399
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1036	618	309	164
d_b, Bicycle Delay [s]	12.77	26.25	39.31	46.37
l_b,int, Bicycle LOS Score for Intersection	2.857	2.502	1.909	1.753
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.326

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	25	0	0	0	0	25	0	14	15	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	17	189	36	5	9	23	159	9	89	98	95
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	51	10	1	2	6	43	2	24	27	26
Total Analysis Volume [veh/h]	4	18	205	39	5	10	25	173	10	97	107	103
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	755	641	695	626	750
Degree of Utilization, x	0.30	0.08	0.30	0.33	0.14

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.27	0.28	1.26	1.41	0.48
95th-Percentile Queue Length [m]	9.65	2.10	9.57	10.76	3.62
Approach Delay [s/veh]	9.81	9.14	10.38	10.22	
Approach LOS	A	A	B	B	
Intersection Delay [s/veh]	10.07				
Intersection LOS	B				

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	267.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.438

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	123	102	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	8	34	1162	1254	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	9	316	341	7
Total Analysis Volume [veh/h]	8	9	37	1263	1363	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.44	0.02	0.07	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	267.63	79.97	12.88	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.57	1.57	0.24	0.12	0.00	0.00
95th-Percentile Queue Length [m/ln]	11.97	11.97	1.84	0.92	0.00	0.00
d_A, Approach Delay [s/veh]	168.28		0.37		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.23					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Signalized	Delay (sec / veh):	13.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.516

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	150.00	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	11	0	11	15	915	0	0	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	95	0	61	0	0	0	0	3	116	71	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	0	61	12	0	12	16	998	116	71	1187	17
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	17	3	0	3	4	271	32	19	323	5
Total Analysis Volume [veh/h]	103	0	66	13	0	13	17	1085	126	77	1290	18
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	12	63	0	0	51	0	11	64	0	13	66	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	19	0	0	22	0	0	16	0	0	7	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	Yes		No	Yes	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	6	16	4	112	101	101	112	103	103
g / C, Green / Cycle	0.04	0.12	0.03	0.80	0.72	0.72	0.80	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.03	0.05	0.08	0.05	0.34	0.09	0.14	0.40	0.40
s, saturation flow rate [veh/h]	3113	1431	310	359	3179	1431	557	1656	1648
c, Capacity [veh/h]	133	167	48	299	2291	1031	444	1221	1215
d1, Uniform Delay [s]	66.32	57.28	69.16	5.55	8.28	5.98	5.13	7.98	7.99
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.16	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.07	1.52	9.10	0.36	0.70	0.24	0.28	1.69	1.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.40	0.54	0.06	0.47	0.12	0.17	0.54	0.54
d, Delay for Lane Group [s/veh]	75.40	58.80	78.26	5.92	8.99	6.23	5.41	9.68	9.69
Lane Group LOS	E	E	E	A	A	A	A	A	A
Critical Lane Group	Yes	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.99	2.25	1.07	0.11	6.50	1.12	0.41	8.13	8.11
50th-Percentile Queue Length [m/ln]	15.20	17.12	8.14	0.84	49.52	8.55	3.11	61.98	61.79
95th-Percentile Queue Length [veh/ln]	3.59	4.04	1.92	0.20	10.68	2.02	0.74	12.81	12.78
95th-Percentile Queue Length [m/ln]	27.36	30.81	14.66	1.51	81.38	15.39	5.60	97.62	97.38

Movement, Approach, & Intersection Results

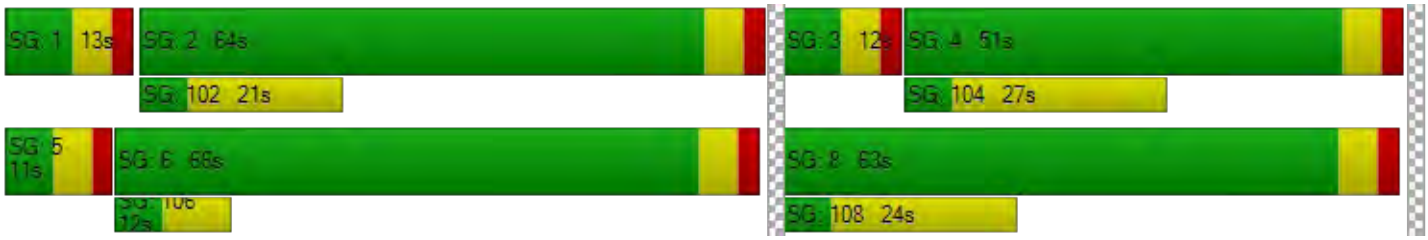
d_M, Delay for Movement [s/veh]	75.40	58.80	58.80	78.26	78.26	78.26	5.92	8.99	6.23	5.41	9.68	9.69
Movement LOS	E	E	E	E	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	68.92			78.26			8.66			9.45		
Approach LOS	E			E			A			A		
d_I, Intersection Delay [s/veh]	13.32											
Intersection LOS	B											
Intersection V/C	0.516											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	61.29	61.29	61.29	61.29
l_p,int, Pedestrian LOS Score for Intersection	2.524	1.805	3.331	3.335
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	814	643	829	857
d_b, Bicycle Delay [s]	24.60	32.23	24.01	22.86
l_b,int, Bicycle LOS Score for Intersection	1.838	1.603	2.573	2.702
Bicycle LOS	A	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.448

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	89	133	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	831	1300	1	0	159
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	223	349	0	0	43
Total Analysis Volume [veh/h]	272	894	1398	1	0	171
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.56	0.01	0.01	0.00	0.00	0.45
d_M, Delay for Movement [s/veh]	21.53	0.00	0.00	0.00	0.00	21.84
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	3.41	1.70	0.00	0.00	0.00	2.24
95th-Percentile Queue Length [m/ln]	25.95	12.97	0.00	0.00	0.00	17.07
d_A, Approach Delay [s/veh]	5.02		0.00		21.84	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	C					

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Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	27.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	67	22	0	130	0	3	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	633	190	1	1058	108	242	247	5	8	96	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	172	52	0	288	29	66	67	1	2	26	0
Total Analysis Volume [veh/h]	9	688	207	1	1150	117	263	268	5	9	104	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	0	0	35	0	0	35	0	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	29	29	29	29
g / C, Green / Cycle	0.41	0.41	0.41	0.41	0.41	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.29	0.29	0.36	0.36	0.40	0.01	0.06
s, saturation flow rate [veh/h]	1503	1577	1869	1645	1335	1106	1867
c, Capacity [veh/h]	675	653	826	681	630	103	773
d1, Uniform Delay [s]	16.00	16.99	18.77	18.80	21.83	12.21	12.72
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.88	6.37	8.72	14.44	13.57	1.67	0.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.65	0.71	0.82	0.87	0.85	0.09	0.14
d, Delay for Lane Group [s/veh]	20.88	23.36	27.49	33.24	35.40	13.88	13.09
Lane Group LOS	C	C	C	C	D	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.64	6.51	10.61	10.34	9.96	0.12	0.99
50th-Percentile Queue Length [m/ln]	42.98	49.57	80.83	78.80	75.92	0.93	7.53
95th-Percentile Queue Length [veh/ln]	9.53	10.69	15.95	15.62	15.14	0.22	1.78
95th-Percentile Queue Length [m/ln]	72.65	81.44	121.53	118.99	115.37	1.68	13.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.88	21.80	23.36	27.49	29.88	33.24	35.40	35.40	35.40	13.88	13.09	13.09
Movement LOS	C	C	C	C	C	C	D	D	D	B	B	B
d_A, Approach Delay [s/veh]	22.15			30.19			35.40			13.15		
Approach LOS	C			C			D			B		
d_I, Intersection Delay [s/veh]	27.91											
Intersection LOS	C											
Intersection V/C	0.763											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	26.58	26.58	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.624	3.093	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	829	829	829	829
d_b, Bicycle Delay [s]	12.01	12.01	12.01	12.01
l_b,int, Bicycle LOS Score for Intersection	2.305	2.606	2.444	1.748
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	16.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	209	0	34	102	21	1	321	40	5	70	55
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	57	0	9	28	6	0	87	11	1	19	15
Total Analysis Volume [veh/h]	49	227	0	37	111	23	1	349	43	5	76	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	40	0	0	40	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	24	24	24
g / C, Green / Cycle	0.49	0.49	0.49	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.16	0.09	0.01	0.21	0.04	0.04
s, saturation flow rate [veh/h]	1766	1678	1589	1834	1834	1465
c, Capacity [veh/h]	918	879	772	680	684	502
d1, Uniform Delay [s]	10.86	10.05	9.39	19.23	15.75	15.82
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.84	0.41	0.07	3.55	0.33	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.17	0.03	0.58	0.11	0.13
d, Delay for Lane Group [s/veh]	11.70	10.47	9.46	22.79	16.07	16.36
Lane Group LOS	B	B	A	C	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.41	1.19	0.17	5.45	0.81	0.73
50th-Percentile Queue Length [m/ln]	18.37	9.08	1.32	41.56	6.19	5.58
95th-Percentile Queue Length [veh/ln]	4.34	2.15	0.31	9.28	1.46	1.32
95th-Percentile Queue Length [m/ln]	33.07	16.35	2.38	70.75	11.14	10.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.70	11.70	0.00	10.47	10.47	9.46	22.79	22.79	22.79	16.07	16.10	16.36
Movement LOS	B	B		B	B	A	C	C	C	B	B	B
d_A, Approach Delay [s/veh]	11.70			10.33			22.79			16.21		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	16.55											
Intersection LOS	B											
Intersection V/C	0.371											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	971	971	686	686
d_b, Bicycle Delay [s]	9.26	9.26	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	2.015	1.842	2.208	1.676
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	30.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	150.00	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	49	26	0	0	0	48	0	0	80	22
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	871	826	116	98	271	89	2	842	292	3	1004	110
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	237	224	32	27	74	24	1	229	79	1	273	30
Total Analysis Volume [veh/h]	947	898	126	107	295	97	2	915	317	3	1091	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	29	25	0	28	24	0	0	27	27	0	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	5.00	5.00	6.00	5.00	5.00	5.00	6.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	3.00	4.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	23	28	28	6	11	11	30	58	30	30
g / C, Green / Cycle	0.29	0.35	0.35	0.08	0.14	0.14	0.37	0.72	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.27	0.27	0.29	0.06	0.11	0.11	0.26	0.11	0.32	0.34
s, saturation flow rate [veh/h]	3459	1870	1792	1781	1870	1715	3560	2813	1870	1807
c, Capacity [veh/h]	994	650	623	143	263	241	1325	2031	696	672
d1, Uniform Delay [s]	27.96	23.43	23.82	36.01	33.14	33.23	21.23	3.48	23.32	23.72
k, delay calibration	0.11	0.16	0.18	0.11	0.11	0.11	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.09	3.24	4.59	7.64	4.77	5.63	2.97	0.04	14.00	17.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.79	0.82	0.75	0.77	0.79	0.69	0.16	0.87	0.90
d, Delay for Lane Group [s/veh]	34.05	26.67	28.42	43.65	37.92	38.85	24.20	3.52	37.32	41.18
Lane Group LOS	C	C	C	D	D	D	C	A	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.07	8.53	8.87	2.27	3.96	3.76	7.15	0.54	12.31	13.03
50th-Percentile Queue Length [m/ln]	69.11	64.97	67.58	17.27	30.17	28.67	54.51	4.10	93.83	99.31
95th-Percentile Queue Length [veh/ln]	14.01	13.31	13.75	4.08	7.13	6.77	11.54	0.97	18.07	18.95
95th-Percentile Queue Length [m/ln]	106.74	101.46	104.80	31.09	54.30	51.61	87.94	7.37	137.68	144.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.05	27.42	28.42	43.65	38.21	38.85	0.00	24.20	3.52	0.00	39.04	41.18
Movement LOS	C	C	C	D	D	D		C	A		D	D
d_A, Approach Delay [s/veh]	30.67			39.50			18.88			39.25		
Approach LOS	C			D			B			D		
d_I, Intersection Delay [s/veh]	30.72											
Intersection LOS	C											
Intersection V/C	0.719											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	29.76
l_p,int, Pedestrian LOS Score for Intersection	3.190	2.875	0.000	3.071
Crosswalk LOS	C	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	475	550	550
d_b, Bicycle Delay [s]	22.50	23.26	21.03	21.03
l_b,int, Bicycle LOS Score for Intersection	3.186	1.971	2.576	2.559
Bicycle LOS	C	A	B	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190719_2025_PM_Scenarios_Market_Lands.vistro
Report File: V:\...\2025 Partial BO w Mitig - PM.pdf

Scenario 3 3 PM Peak - 2025 - mitig 1 - partial BO
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.728	27.1	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.679	20.7	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.554	12.1	B
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.513	166.0	F
13	Dupuy & Marion	Signalized	HCM 6th Edition	SB Left	0.704	15.8	B
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.464	17.1	C
15	Dawson & Marion	Signalized	HCM 6th Edition	SEB Left	0.730	20.7	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.247	12.9	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	0.744	33.1	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.728

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	71	0	0	33	69	92
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	183	1328	1975	474	792	397
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	361	537	129	215	108
Total Analysis Volume [veh/h]	199	1443	2147	515	861	432
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	4	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	14	58	44	32	32	32
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	No	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	8	53	39	70	25	39
g / C, Green / Cycle	0.09	0.59	0.43	0.78	0.28	0.44
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.42	0.32	0.25	0.27
s, saturation flow rate [veh/h]	3459	5094	5094	1589	3459	1589
c, Capacity [veh/h]	307	2984	2192	1236	971	694
d1, Uniform Delay [s]	39.64	10.77	25.24	3.29	30.99	19.63
k, delay calibration	0.11	0.50	0.50	0.39	0.11	0.28
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.29	0.56	14.95	0.81	2.96	2.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.65	0.48	0.98	0.42	0.89	0.62
d, Delay for Lane Group [s/veh]	41.92	11.33	40.20	4.09	33.95	22.00
Lane Group LOS	D	B	D	A	C	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.10	4.55	15.95	1.63	9.04	7.09
50th-Percentile Queue Length [m/ln]	16.03	34.67	121.50	12.42	68.88	54.04
95th-Percentile Queue Length [veh/ln]	3.79	8.05	22.49	2.93	13.97	11.46
95th-Percentile Queue Length [m/ln]	28.85	61.32	171.41	22.35	106.45	87.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.92	11.33	40.20	4.09	33.95	22.00
Movement LOS	D	B	D	A	C	C
d_A, Approach Delay [s/veh]	15.04		33.21		29.96	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	27.13					
Intersection LOS	C					
Intersection V/C	0.728					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	0.00	34.67
l_p,int, Pedestrian LOS Score for Intersection	4.097	0.000	2.952
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
l_b,int, Bicycle LOS Score for Intersection	5.036	5.597	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	20.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	27	0	0	66	74	46	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	1202	11	15	2523	308	248	3	59	24	1	46
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	327	3	4	686	84	67	1	16	7	0	13
Total Analysis Volume [veh/h]	58	1307	12	16	2742	335	270	3	64	26	1	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	62	86	11	11	35	0	17	22	0	11	16	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	6	88	97	3	85	85	11	12	12	21	4	13
g / C, Green / Cycle	0.04	0.68	0.75	0.02	0.66	0.66	0.08	0.09	0.09	0.16	0.03	0.10
(v / s)_i Volume / Saturation Flow Rate	0.03	0.26	0.01	0.01	0.54	0.21	0.08	0.00	0.04	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1781	5053	1589	1781	5094	1589	3459	1870	1589	1482	1870	1589
c, Capacity [veh/h]	78	3429	1189	35	3334	1040	293	175	149	275	61	156
d1, Uniform Delay [s]	61.44	9.06	4.15	63.04	16.80	9.83	59.08	53.48	55.63	46.27	60.87	54.56
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.08	0.32	0.02	9.02	2.43	0.82	11.83	0.04	1.95	0.15	0.11	1.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.38	0.01	0.46	0.82	0.32	0.92	0.02	0.43	0.09	0.02	0.32
d, Delay for Lane Group [s/veh]	74.52	9.38	4.17	72.06	19.23	10.65	70.90	53.52	57.59	46.42	60.98	55.73
Lane Group LOS	E	A	A	E	B	B	E	D	E	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.13	4.70	0.07	0.60	17.92	3.92	4.89	0.09	2.07	0.73	0.03	1.58
50th-Percentile Queue Length [m/ln]	16.22	35.81	0.53	4.56	136.51	29.85	37.27	0.70	15.76	5.57	0.26	12.04
95th-Percentile Queue Length [veh/ln]	3.83	8.26	0.12	1.08	24.86	7.05	8.52	0.16	3.72	1.32	0.06	2.84
95th-Percentile Queue Length [m/ln]	29.19	62.91	0.95	8.21	189.41	53.73	64.91	1.25	28.36	10.03	0.46	21.68

Movement, Approach, & Intersection Results

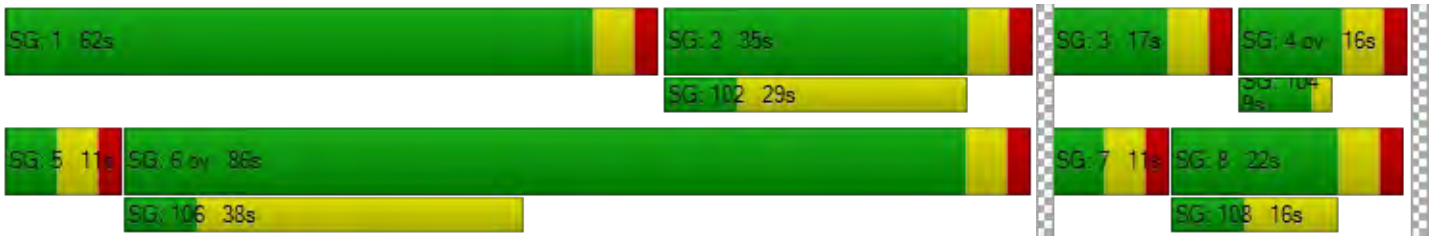
d_M, Delay for Movement [s/veh]	74.52	9.38	4.17	72.06	19.23	10.65	70.90	53.52	57.59	46.42	60.98	55.73
Movement LOS	E	A	A	E	B	B	E	D	E	D	E	E
d_A, Approach Delay [s/veh]	12.08			18.58			68.22			52.65		
Approach LOS	B			B			E			D		
d_I, Intersection Delay [s/veh]	20.71											
Intersection LOS	C											
Intersection V/C	0.679											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	54.47	54.47	54.47
l_p,int, Pedestrian LOS Score for Intersection	4.115	4.073	2.781	2.353
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1231	446	246	154
d_b, Bicycle Delay [s]	9.62	39.23	49.98	55.38
l_b,int, Bicycle LOS Score for Intersection	2.317	3.261	1.838	1.687
Bicycle LOS	B	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	23	0	0	0	0	23	0	37	37	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	11	122	55	17	16	4	148	16	125	201	21
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	33	15	5	4	1	40	4	34	55	6
Total Analysis Volume [veh/h]	8	12	133	60	18	17	4	161	17	136	218	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	707	630	687	639	761
Degree of Utilization, x	0.22	0.15	0.26	0.55	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.82	0.53	1.06	3.40	0.09
95th-Percentile Queue Length [m]	6.24	4.03	8.10	25.89	0.71
Approach Delay [s/veh]	9.49	9.73	10.12	14.63	
Approach LOS	A	A	B	B	
Intersection Delay [s/veh]	12.06				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	166.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.513

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	147	137	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	23	8	1472	1187	6
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	6	2	400	323	2
Total Analysis Volume [veh/h]	17	25	9	1600	1290	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.51	0.06	0.02	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	166.03	66.21	14.08	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	2.48	2.48	0.07	0.03	0.00	0.00
95th-Percentile Queue Length [m/ln]	18.87	18.87	0.52	0.26	0.00	0.00
d_A, Approach Delay [s/veh]	106.61		0.08		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.56					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Signalized	Delay (sec / veh):	15.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.704

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	150.00	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	12	0	9	5	1275	0	0	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	58.00	33.00	2.00	60.00	3.00	2.00	2.00	3.00	56.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	123	0	114	0	1	0	1	18	131	88	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	20	0	7	0	0	0	0	10	12	22	-22	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	143	0	121	13	1	10	6	1414	143	110	1085	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	0	33	4	0	3	2	384	39	30	295	3
Total Analysis Volume [veh/h]	155	0	132	14	1	11	7	1537	155	120	1179	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	33	70	0	0	37	0	11	29	0	11	29	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	13	0	0	7	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	Yes		No	Yes	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	7	17	4	81	70	70	81	74	74
g / C, Green / Cycle	0.07	0.15	0.03	0.74	0.64	0.64	0.74	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.20	0.02	0.44	0.10	0.24	0.32	0.32
s, saturation flow rate [veh/h]	3459	1589	129	295	3532	1589	495	1855	1849
c, Capacity [veh/h]	228	242	54	257	2261	1017	363	1253	1249
d1, Uniform Delay [s]	50.25	43.14	54.83	5.50	12.62	7.90	11.63	8.54	8.54
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.33	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.55	1.92	6.36	0.20	1.67	0.32	1.61	1.30	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.55	0.48	0.03	0.68	0.15	0.33	0.48	0.48
d, Delay for Lane Group [s/veh]	53.80	45.06	61.19	5.69	14.29	8.21	13.24	9.84	9.84
Lane Group LOS	D	D	E	A	B	A	B	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.19	3.44	0.83	0.05	11.11	1.43	0.77	6.33	6.31
50th-Percentile Queue Length [m/ln]	16.70	26.19	6.32	0.36	84.65	10.87	5.90	48.23	48.12
95th-Percentile Queue Length [veh/ln]	3.94	6.19	1.49	0.09	16.58	2.57	1.39	10.46	10.44
95th-Percentile Queue Length [m/ln]	30.06	47.15	11.37	0.65	126.31	19.56	10.63	79.68	79.52

Movement, Approach, & Intersection Results

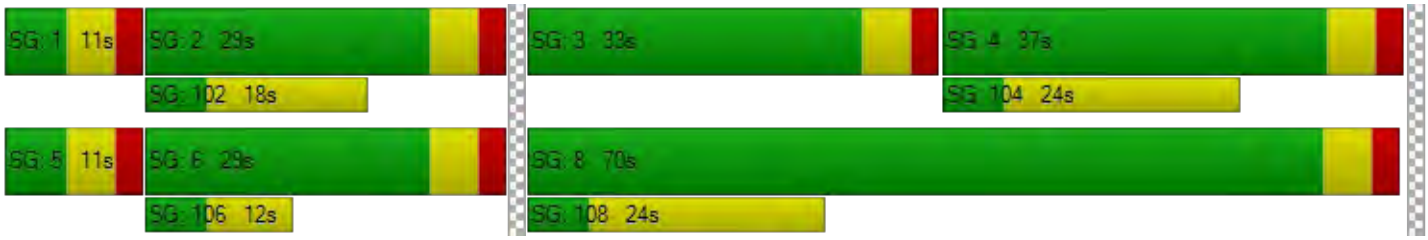
d_M, Delay for Movement [s/veh]	53.80	45.06	45.06	61.19	61.19	61.19	5.69	14.29	8.21	13.24	9.84	9.84
Movement LOS	D	D	D	E	E	E	A	B	A	B	A	A
d_A, Approach Delay [s/veh]	49.78			61.19			13.70			10.15		
Approach LOS	D			E			B			B		
d_I, Intersection Delay [s/veh]	15.79											
Intersection LOS	B											
Intersection V/C	0.704											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.37	46.37	46.37	46.37
l_p,int, Pedestrian LOS Score for Intersection	2.606	1.769	3.453	3.498
Crosswalk LOS	B	A	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1164	564	418	418
d_b, Bicycle Delay [s]	9.62	28.37	34.40	34.40
l_b,int, Bicycle LOS Score for Intersection	2.033	1.603	2.961	2.640
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.464

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	1	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	210	106	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	262	1347	853	1	0	237
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	362	229	0	0	64
Total Analysis Volume [veh/h]	282	1448	917	1	0	255
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.38	0.01	0.01	0.00	0.00	0.46
d_M, Delay for Movement [s/veh]	12.85	0.00	0.00	0.00	0.00	17.12
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	1.80	0.90	0.00	0.00	0.00	2.44
95th-Percentile Queue Length [m/ln]	13.68	6.84	0.00	0.00	0.00	18.59
d_A, Approach Delay [s/veh]	2.09		0.00		17.12	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.75					
Intersection LOS	C					

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Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	20.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	161	48	0	104	0	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	1058	285	3	701	30	152	93	28	62	190	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	288	77	1	190	8	41	25	8	17	52	0
Total Analysis Volume [veh/h]	3	1150	310	3	762	33	165	101	30	67	207	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	43	0	0	43	0	0	27	0	0	27	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	37	37	37	37	21	21	21
g / C, Green / Cycle	0.53	0.53	0.53	0.53	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.42	0.43	0.23	0.23	0.30	0.05	0.11
s, saturation flow rate [veh/h]	1868	1574	1860	1676	984	1259	1870
c, Capacity [veh/h]	1039	832	1035	886	375	103	561
d1, Uniform Delay [s]	13.43	13.63	10.03	10.05	26.73	18.94	19.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.17	8.51	1.18	1.51	15.41	27.78	1.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.81	0.41	0.43	0.79	0.65	0.37
d, Delay for Lane Group [s/veh]	18.60	22.14	11.21	11.55	42.14	46.72	21.15
Lane Group LOS	B	C	B	B	D	D	C
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	9.58	9.02	3.56	3.28	6.16	1.56	2.71
50th-Percentile Queue Length [m/ln]	73.02	68.71	27.14	24.98	46.92	11.91	20.65
95th-Percentile Queue Length [veh/ln]	14.66	13.94	6.41	5.90	10.23	2.81	4.88
95th-Percentile Queue Length [m/ln]	111.70	106.23	48.85	44.96	77.92	21.44	37.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	18.60	19.73	22.14	11.21	11.37	11.55	42.14	42.14	42.14	46.72	21.15	21.15
Movement LOS	B	B	C	B	B	B	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	20.24			11.37			42.14			27.40		
Approach LOS	C			B			D			C		
d_I, Intersection Delay [s/veh]	20.72											
Intersection LOS	C											
Intersection V/C	0.730											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	26.58	26.58	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.520	3.212	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1057	1057	600	600
d_b, Bicycle Delay [s]	7.78	7.78	17.15	17.15
l_b,int, Bicycle LOS Score for Intersection	2.767	2.218	2.048	2.012
Bicycle LOS	C	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.247

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0000	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	1	0	0	1	0	0	0	0	0	0	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	236	0	47	189	17	0	92	35	24	207	48
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	64	0	13	51	5	0	25	10	7	56	13
Total Analysis Volume [veh/h]	28	257	0	51	205	18	0	100	38	26	225	52
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	0	0	35	0	0	25	0	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	19	19	19
g / C, Green / Cycle	0.48	0.48	0.48	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.01	0.08	0.09	0.09
s, saturation flow rate [veh/h]	1818	1709	1589	1783	1793	1598
c, Capacity [veh/h]	945	898	768	625	637	506
d1, Uniform Delay [s]	9.45	9.28	8.10	15.18	15.33	15.38
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.82	0.80	0.06	0.82	0.95	1.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.29	0.02	0.22	0.25	0.28
d, Delay for Lane Group [s/veh]	10.27	10.08	8.16	16.00	16.28	16.76
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.03	1.80	0.11	1.36	1.61	1.47
50th-Percentile Queue Length [m/ln]	15.47	13.71	0.84	10.39	12.25	11.20
95th-Percentile Queue Length [veh/ln]	3.65	3.24	0.20	2.46	2.89	2.64
95th-Percentile Queue Length [m/ln]	27.85	24.68	1.51	18.71	22.05	20.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.27	10.27	0.00	10.08	10.08	8.16	16.00	16.00	16.00	16.28	16.47	16.76
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	10.27			9.95			16.00			16.50		
Approach LOS	B			A			B			B		
d_I, Intersection Delay [s/veh]	12.86											
Intersection LOS	B											
Intersection V/C	0.247											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	633	633
d_b, Bicycle Delay [s]	8.01	8.01	14.01	14.01
l_b,int, Bicycle LOS Score for Intersection	2.030	2.012	1.787	1.810
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	33.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.744

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	150.00	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	2	990	783	3	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	2.00
Growth Factor	1.0870	1.0870	1.0870	1.0870	1.0870	1.0870	1.0000	1.0870	1.0870	1.0000	1.0870	1.0870
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	36	15	0	0	0	96	0	0	73	64
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	332	436	106	97	858	93	2	1172	851	3	994	172
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	118	29	26	233	25	1	318	231	1	270	47
Total Analysis Volume [veh/h]	361	474	115	105	933	101	2	1274	925	3	1080	187
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	15	29	0	15	29	0	0	36	36	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	5.00	5.00	6.00	5.00	5.00	5.00	6.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	3.00	4.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	9	27	27	6	24	24	31	45	31	31
g / C, Green / Cycle	0.11	0.34	0.34	0.08	0.30	0.30	0.39	0.56	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.10	0.16	0.16	0.06	0.28	0.28	0.36	0.33	0.34	0.36
s, saturation flow rate [veh/h]	3459	1870	1745	1781	1870	1807	3560	2836	1870	1777
c, Capacity [veh/h]	389	626	585	137	560	541	1381	1596	725	689
d1, Uniform Delay [s]	35.18	21.14	21.14	36.20	27.30	27.31	23.34	11.34	22.66	23.29
k, delay calibration	0.11	0.11	0.11	0.11	0.25	0.25	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.86	0.59	0.63	8.49	15.65	16.19	11.62	0.34	13.78	19.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.93	0.49	0.49	0.76	0.94	0.94	0.92	0.58	0.87	0.92
d, Delay for Lane Group [s/veh]	45.03	21.72	21.77	44.69	42.94	43.50	34.96	11.68	36.44	42.61
Lane Group LOS	D	C	C	D	D	D	C	B	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.86	4.30	4.02	2.26	11.47	11.17	12.53	4.53	12.73	13.93
50th-Percentile Queue Length [m/ln]	29.41	32.79	30.66	17.19	87.37	85.13	95.50	34.55	96.99	106.11
95th-Percentile Queue Length [veh/ln]	6.95	7.71	7.24	4.06	17.02	16.65	18.34	8.03	18.58	20.05
95th-Percentile Queue Length [m/ln]	52.94	58.71	55.19	30.94	129.68	126.90	139.75	61.17	141.57	152.75

Movement, Approach, & Intersection Results

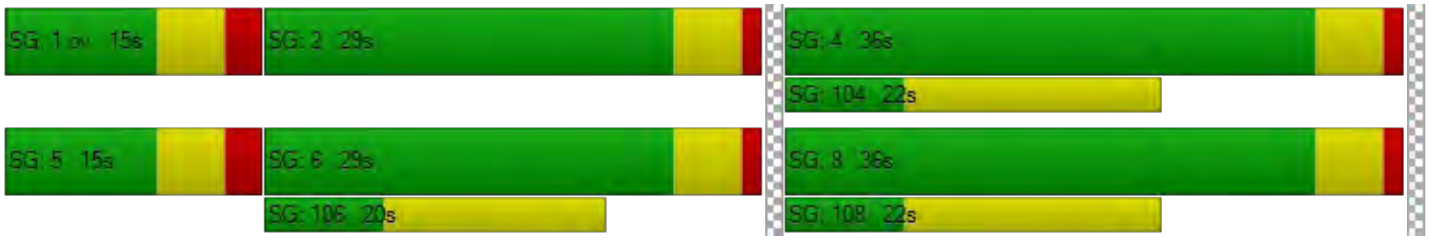
d_M, Delay for Movement [s/veh]	45.03	21.74	21.77	44.69	43.19	43.50	0.00	34.96	11.68	0.00	38.99	42.61
Movement LOS	D	C	C	D	D	D		C	B		D	D
d_A, Approach Delay [s/veh]	30.59			43.35			25.17			39.52		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	33.10											
Intersection LOS	C											
Intersection V/C	0.744											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	0.00	29.76
l_p,int, Pedestrian LOS Score for Intersection	3.238	2.947	0.000	3.199
Crosswalk LOS	C	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	775	775
d_b, Bicycle Delay [s]	19.60	19.60	15.01	15.01
l_b,int, Bicycle LOS Score for Intersection	2.343	2.499	3.374	2.605
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 9 AM Peak 2030 BG

Report File: V:\...\2030 BG - AM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.909	70.3	E
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.876	48.4	D
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.293	9.8	A
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.405	242.9	F
13	Marion & Dupuy	Two-way stop	HCM 6th Edition	SB Left	0.547	227.3	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	EB Left	0.614	23.7	C
15	Marion & Dawson	Signalized	HCM 6th Edition	NWB Thru	0.818	32.4	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NWB Thru	0.407	14.6	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	1.012	93.6	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	70.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.909

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	560	1626	1590	659	587	69
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	152	442	432	179	160	19
Total Analysis Volume [veh/h]	609	1767	1728	716	638	75
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	36	106	70	34	34	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	19	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	100	100	64	98	28	28
g / C, Green / Cycle	0.71	0.71	0.46	0.70	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.76	0.50	0.51	0.45	0.22	0.22
s, saturation flow rate [veh/h]	797	3503	3418	1589	1709	1483
c, Capacity [veh/h]	517	2502	1562	1112	342	297
d1, Uniform Delay [s]	51.06	11.53	38.00	11.46	56.00	56.00
k, delay calibration	0.50	0.50	0.50	0.50	0.44	0.44
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	99.21	1.71	57.67	2.87	79.91	85.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.18	0.71	1.11	0.64	1.11	1.12
d, Delay for Lane Group [s/veh]	150.27	13.24	95.67	14.34	135.91	141.40
Lane Group LOS	F	B	F	B	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	19.55	13.66	37.45	11.16	19.63	17.49
50th-Percentile Queue Length [m/ln]	148.98	104.11	285.39	85.07	149.59	133.25
95th-Percentile Queue Length [veh/ln]	30.36	19.72	51.23	16.64	28.48	25.83
95th-Percentile Queue Length [m/ln]	231.35	150.30	390.33	126.82	217.05	196.79

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	150.27	13.24	95.67	14.34	138.15	141.40
Movement LOS	F	B	F	B	F	F
d_A, Approach Delay [s/veh]	48.36		71.84		138.47	
Approach LOS	D		E		F	
d_I, Intersection Delay [s/veh]	70.34					
Intersection LOS	E					
Intersection V/C	0.909					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	0.00	59.43
l_p,int, Pedestrian LOS Score for Intersection	4.494	0.000	3.389
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	70.00	70.00	70.00
l_b,int, Bicycle LOS Score for Intersection	6.093	6.149	5.309
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	48.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.876

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	2.00	3.00	1.00	6.00	8.00	6.00	4.00	47.00	1.00	1.00	3.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	2197	40	90	1328	211	312	28	23	35	2	78
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	597	11	24	361	57	85	8	6	10	1	21
Total Analysis Volume [veh/h]	68	2388	43	98	1443	229	339	30	25	38	2	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	78	97	11	16	35	0	22	26	0	11	15	16
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	8	95	105	10	97	97	16	17	17	27	5	21
g / C, Green / Cycle	0.06	0.63	0.70	0.07	0.64	0.64	0.11	0.11	0.11	0.18	0.03	0.14
(v / s)_i Volume / Saturation Flow Rate	0.05	0.67	0.03	0.05	0.42	0.15	0.10	0.02	0.02	0.03	0.00	0.05
s, saturation flow rate [veh/h]	1509	3560	1577	1795	3446	1513	3348	1840	1574	1489	1885	1577
c, Capacity [veh/h]	85	2260	1106	119	2220	975	357	207	177	319	61	219
d1, Uniform Delay [s]	69.90	27.40	6.89	69.19	16.33	11.19	66.60	59.99	60.04	51.64	70.27	58.81
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.26	36.06	0.07	13.26	1.49	0.57	13.01	0.30	0.38	0.16	0.21	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	1.06	0.04	0.83	0.65	0.23	0.95	0.14	0.15	0.12	0.03	0.39
d, Delay for Lane Group [s/veh]	85.17	63.46	6.95	82.45	17.83	11.75	79.60	60.29	60.42	51.80	70.48	59.94
Lane Group LOS	F	F	A	F	B	B	E	E	E	D	E	E
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.89	46.70	0.40	4.08	14.14	3.13	7.11	1.02	0.92	1.23	0.08	3.03
50th-Percentile Queue Length [m/ln]	22.05	355.85	3.07	31.08	107.72	23.82	54.19	7.76	7.02	9.36	0.60	23.08
95th-Percentile Queue Length [veh/ln]	5.21	60.82	0.73	7.34	20.30	5.63	11.49	1.83	1.66	2.21	0.14	5.45
95th-Percentile Queue Length [m/ln]	39.69	463.47	5.53	55.95	154.70	42.88	87.52	13.96	12.63	16.85	1.08	41.55

Movement, Approach, & Intersection Results

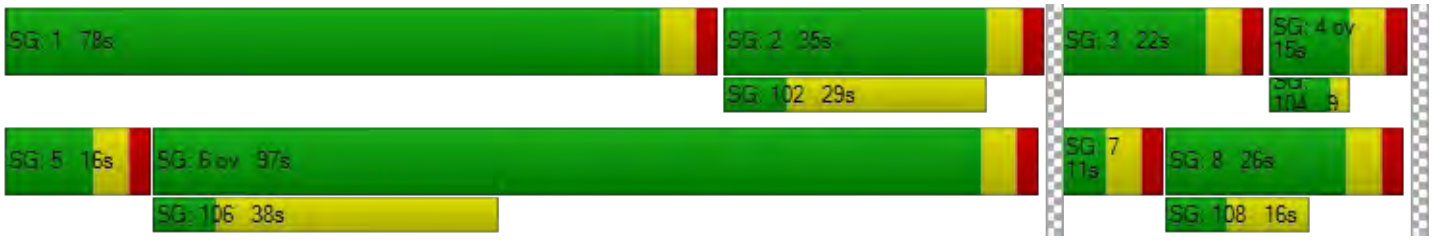
d_M, Delay for Movement [s/veh]	85.17	63.46	6.95	82.45	17.83	11.75	79.60	60.30	60.42	51.80	70.48	59.94
Movement LOS	F	F	A	F	B	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	63.08			20.62			76.92			57.63		
Approach LOS	E			C			E			E		
d_I, Intersection Delay [s/veh]	48.38											
Intersection LOS	D											
Intersection V/C	0.876											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.220	4.142	2.782	2.420
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1213	387	267	120
d_b, Bicycle Delay [s]	11.60	48.80	56.33	66.27
l_b,int, Bicycle LOS Score for Intersection	3.621	3.020	1.885	1.766
Bicycle LOS	D	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.293

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	6.00	1.00	15.00	1.00	13.00	1.00	6.00	1.00	1.00	8.00	6.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	19	176	38	6	9	24	143	9	80	89	101
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	48	10	2	2	7	39	2	22	24	27
Total Analysis Volume [veh/h]	5	21	191	41	7	10	26	155	10	87	97	110
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	767	633	695	628	747
Degree of Utilization, x	0.28	0.09	0.27	0.29	0.15

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.16	0.30	1.12	1.22	0.51
95th-Percentile Queue Length [m]	8.87	2.30	8.51	9.29	3.92
Approach Delay [s/veh]	9.53	9.26	10.13	9.89	
Approach LOS	A	A	B	A	
Intersection Delay [s/veh]	9.80				
Intersection LOS	A				

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	242.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.405

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	8	36	1114	1235	26
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	10	303	336	7
Total Analysis Volume [veh/h]	8	9	39	1211	1342	28
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.40	0.02	0.08	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	242.94	69.87	12.77	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.48	1.48	0.25	0.13	0.00	0.00
95th-Percentile Queue Length [m/ln]	11.25	11.25	1.92	0.96	0.00	0.00
d_A, Approach Delay [s/veh]	151.32		0.40		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.16					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Marion & Dupuy

Control Type:	Two-way stop	Delay (sec / veh):	227.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

Intersection Setup

Name	Dupuy Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Dupuy Ave		Marion St		Marion St	
Base Volume Input [veh/h]	11	11	15	915	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	55.00	82.00	27.00	3.00	4.00	50.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	13	17	1066	1268	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	4	5	290	345	5
Total Analysis Volume [veh/h]	14	14	18	1159	1378	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.55	0.06	0.05	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	227.28	101.53	15.12	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	2.29	2.29	0.15	0.08	0.00	0.00
95th-Percentile Queue Length [m/ln]	17.47	17.47	1.15	0.58	0.00	0.00
d_A, Approach Delay [s/veh]	164.40		0.23		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.87					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	23.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	4.00	4.00	2.00	5.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	271	796	1251	1	0	170
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	216	340	0	0	46
Total Analysis Volume [veh/h]	295	865	1360	1	0	185
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.61	0.01	0.01	0.00	0.00	0.48
d_M, Delay for Movement [s/veh]	23.68	0.00	0.00	0.00	0.00	22.60
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	4.06	2.03	0.00	0.00	0.00	2.51
95th-Percentile Queue Length [m/ln]	30.93	15.47	0.00	0.00	0.00	19.11
d_A, Approach Delay [s/veh]	6.02		0.00		22.60	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.13					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Marion & Dawson

Control Type:	Signalized	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	6.00	6.00	1.00	4.00	1.00	3.00	8.00	40.00	13.00	20.00	1.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	607	181	1	995	115	256	264	6	8	103	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	165	49	0	270	31	70	72	2	2	28	0
Total Analysis Volume [veh/h]	9	660	197	1	1082	125	278	287	7	9	112	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			1			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	56.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	29	0	0	29	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	23	23	23	25	25	25
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.30	0.30	0.35	0.35	0.47	0.01	0.07
s, saturation flow rate [veh/h]	1313	1533	1839	1611	1224	989	1597
c, Capacity [veh/h]	565	588	765	618	599	120	666
d1, Uniform Delay [s]	15.05	16.39	17.54	17.56	20.47	10.40	10.99
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.33	10.55	10.79	20.35	27.13	1.21	0.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.79	0.84	0.91	0.95	0.07	0.17
d, Delay for Lane Group [s/veh]	22.38	26.94	28.33	37.91	47.60	11.61	11.54
Lane Group LOS	C	C	C	D	D	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.78	6.45	9.28	9.63	11.69	0.10	0.89
50th-Percentile Queue Length [m/ln]	36.40	49.15	70.71	73.40	89.05	0.76	6.81
95th-Percentile Queue Length [veh/ln]	8.36	10.61	14.28	14.72	17.29	0.18	1.61
95th-Percentile Queue Length [m/ln]	63.72	80.89	108.78	112.18	131.76	1.37	12.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.38	24.24	26.94	28.33	32.23	37.91	47.60	47.60	47.60	11.61	11.54	11.54
Movement LOS	C	C	C	C	C	D	D	D	D	B	B	B
d_A, Approach Delay [s/veh]	24.83			32.81			47.60			11.54		
Approach LOS	C			C			D			B		
d_I, Intersection Delay [s/veh]	32.43											
Intersection LOS	C											
Intersection V/C	0.818											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	20.01	20.01	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.590	3.040	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	767	767	833	833
d_b, Bicycle Delay [s]	11.41	11.41	10.21	10.21
l_b,int, Bicycle LOS Score for Intersection	2.274	2.556	2.503	1.761
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.407

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	3.00	2.00	18.00	5.00	5.00	2.00	7.00	22.00	20.00	32.00	12.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	224	0	36	110	22	1	344	43	6	75	59
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	61	0	10	30	6	0	93	12	2	20	16
Total Analysis Volume [veh/h]	52	243	0	39	120	24	1	374	47	7	82	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	29	0	0	29	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	23	23	25	25	25
g / C, Green / Cycle	0.38	0.38	0.38	0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.17	0.10	0.02	0.24	0.06	0.06
s, saturation flow rate [veh/h]	1764	1670	1551	1760	1375	1115
c, Capacity [veh/h]	747	715	595	793	638	465
d1, Uniform Delay [s]	13.57	12.50	11.59	13.43	10.83	10.90
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	0.72	0.13	2.55	0.41	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.39	0.22	0.04	0.53	0.13	0.15
d, Delay for Lane Group [s/veh]	15.13	13.22	11.71	15.97	11.25	11.60
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.80	1.37	0.19	4.17	0.64	0.59
50th-Percentile Queue Length [m/ln]	21.35	10.46	1.47	31.80	4.86	4.46
95th-Percentile Queue Length [veh/ln]	5.04	2.47	0.35	7.51	1.15	1.05
95th-Percentile Queue Length [m/ln]	38.44	18.83	2.65	57.24	8.76	8.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.13	15.13	0.00	13.22	13.22	11.71	15.97	15.97	15.97	11.25	11.28	11.60
Movement LOS	B	B		B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	15.13			13.02			15.97			11.41		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.56											
Intersection LOS	B											
Intersection V/C	0.407											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	767	767	833	833
d_b, Bicycle Delay [s]	11.41	11.41	10.21	10.21
l_b,int, Bicycle LOS Score for Intersection	2.046	1.862	2.256	1.686
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	93.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.012

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	9.00	4.00	5.00	1.00	3.00	2.00	1.00	3.00	11.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	933	885	72	77	290	96	2	850	313	3	990	94
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9600	0.9200	0.9200	0.9600	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	254	240	20	21	79	26	1	231	85	1	269	26
Total Analysis Volume [veh/h]	1014	962	78	84	315	104	2	924	340	3	1076	102
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			8			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			8			8		
v_co, Outbound Pedestrian Volume crossing	0			0			8			1		
v_ci, Inbound Pedestrian Volume crossing mi	8			1			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	76.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	73	81	0	13	21	0	0	46	0	0	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	67	76	7	16	16	41	41	41	41
g / C, Green / Cycle	0.48	0.54	0.05	0.11	0.11	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.56	0.56	0.05	0.12	0.12	0.26	0.21	0.32	0.33
s, saturation flow rate [veh/h]	1795	1860	1681	1840	1687	3532	1589	1855	1800
c, Capacity [veh/h]	859	1010	84	210	193	1034	465	543	527
d1, Uniform Delay [s]	36.50	32.00	66.50	62.00	62.00	47.41	44.53	49.50	49.50
k, delay calibration	0.50	0.49	0.11	0.11	0.12	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	93.07	36.01	45.51	36.72	45.09	11.72	9.70	63.40	75.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.18	1.03	1.00	1.03	1.05	0.89	0.73	1.08	1.12
d, Delay for Lane Group [s/veh]	129.57	68.01	112.00	98.72	107.09	59.12	54.23	112.90	125.04
Lane Group LOS	F	F	F	F	F	E	D	F	F
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	50.33	42.27	4.04	9.56	9.21	16.88	11.76	28.22	29.17
50th-Percentile Queue Length [m/ln]	383.48	322.14	30.82	72.84	70.20	128.61	89.60	215.07	222.24
95th-Percentile Queue Length [veh/ln]	70.03	54.29	7.28	14.81	14.48	23.62	17.38	38.91	40.77
95th-Percentile Queue Length [m/ln]	533.62	413.68	55.48	112.87	110.35	179.95	132.45	296.48	310.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	129.57	68.01	68.01	112.00	101.34	107.09	0.00	59.12	54.23	0.00	118.40	125.04
Movement LOS	F	E	E	F	F	F		E	D		F	F
d_A, Approach Delay [s/veh]	98.40			104.31			57.81			118.97		
Approach LOS	F			F			E			F		
d_I, Intersection Delay [s/veh]	93.58											
Intersection LOS	F											
Intersection V/C	1.012											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	59.43	59.43	59.43
l_p,int, Pedestrian LOS Score for Intersection	3.210	2.846	3.397	3.068
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1086	229	586	586
d_b, Bicycle Delay [s]	14.63	54.91	35.00	35.00
l_b,int, Bicycle LOS Score for Intersection	4.949	1.975	2.602	2.531
Bicycle LOS	E	A	B	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190722_Market_Lands_Updated_Traffic_Counts.vistro

Scenario 10 PM Peak 2030 BG

Report File: V:\...\2030 BG - PM.pdf

7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	SB Thru	1.085	106.4	F
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	SB Thru	0.951	70.3	E
9	Maginot & Speers	Two-way stop	HCM 6th Edition	WB Left	0.214	19.6	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.436	133.0	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	SB Left	0.711	310.0	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.481	17.1	C
15	Dawson & Marion	Signalized	HCM 6th Edition	EB Right	0.716	24.6	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.266	13.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	EB Right	1.133	108.4	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	106.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.085

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	3.00	2.00	2.00	1.00	3.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	1424	2117	473	775	327
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	387	575	129	211	89
Total Analysis Volume [veh/h]	130	1548	2301	514	842	355
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	17	99	82	51	51	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	5	7	7	7	0
Pedestrian Clearance [s]	0	10	19	21	21	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	11	93	76	127	45	45
g / C, Green / Cycle	0.07	0.62	0.51	0.85	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.08	0.44	0.65	0.32	0.34	0.36
s, saturation flow rate [veh/h]	1652	3532	3560	1589	1795	1648
c, Capacity [veh/h]	121	2190	1804	1345	539	494
d1, Uniform Delay [s]	69.50	19.28	37.00	2.61	52.50	52.50
k, delay calibration	0.11	0.50	0.50	0.49	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	59.05	1.95	128.45	0.81	76.20	108.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.07	0.71	1.28	0.38	1.12	1.20
d, Delay for Lane Group [s/veh]	128.55	21.23	165.45	3.42	128.70	161.02
Lane Group LOS	F	C	F	A	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.54	17.20	62.85	2.29	31.58	33.43
50th-Percentile Queue Length [m/ln]	49.85	131.09	478.95	17.42	240.67	254.75
95th-Percentile Queue Length [veh/ln]	10.99	24.01	90.23	4.11	43.87	47.94
95th-Percentile Queue Length [m/ln]	83.74	182.93	687.57	31.35	334.25	365.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	128.55	21.23	165.45	3.42	137.94	161.02
Movement LOS	F	C	F	A	F	F
d_A, Approach Delay [s/veh]	29.55		135.86		144.73	
Approach LOS	C		F		F	
d_I, Intersection Delay [s/veh]	106.38					
Intersection LOS	F					
Intersection V/C	1.085					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	0.00	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.578	0.000	2.903
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	75.00	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	5.517	6.455	6.107
Bicycle LOS	F	F	F

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	70.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.951

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	3.00	20.00	8.00	2.00	5.00	7.00	1.00	12.00	1.00	1.00	13.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	57	1259	12	16	2633	250	217	3	63	26	1	49
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	342	3	4	715	68	59	1	17	7	0	13
Total Analysis Volume [veh/h]	62	1368	13	17	2862	272	236	3	68	28	1	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	13	98	14	11	96	0	17	27	0	14	24	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	7	107	116	4	103	103	11	12	12	22	5	14
g / C, Green / Cycle	0.05	0.71	0.78	0.02	0.69	0.69	0.07	0.08	0.08	0.14	0.03	0.09
(v / s)_i Volume / Saturation Flow Rate	0.04	0.39	0.01	0.01	0.80	0.18	0.07	0.00	0.04	0.02	0.00	0.04
s, saturation flow rate [veh/h]	1509	3532	1360	1695	3560	1551	3320	1885	1602	1498	1885	1449
c, Capacity [veh/h]	70	2515	1054	41	2455	1070	243	152	129	235	58	137
d1, Uniform Delay [s]	71.08	10.16	3.83	72.14	23.29	8.77	69.33	63.49	66.20	55.96	70.53	63.80
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	27.03	0.85	0.02	6.55	79.48	0.57	20.40	0.05	3.29	0.22	0.12	1.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.54	0.01	0.41	1.17	0.25	0.97	0.02	0.53	0.12	0.02	0.39
d, Delay for Lane Group [s/veh]	98.11	11.01	3.85	78.69	102.77	9.34	89.73	63.54	69.49	56.18	70.65	65.57
Lane Group LOS	F	B	A	E	F	A	F	E	E	E	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.85	9.46	0.08	0.71	63.24	3.19	5.22	0.11	2.63	0.95	0.04	1.98
50th-Percentile Queue Length [m/ln]	21.74	72.09	0.61	5.39	481.91	24.28	39.79	0.83	20.05	7.21	0.30	15.10
95th-Percentile Queue Length [veh/ln]	5.13	14.51	0.14	1.27	86.96	5.74	8.97	0.20	4.74	1.70	0.07	3.57
95th-Percentile Queue Length [m/ln]	39.13	110.53	1.09	9.71	662.61	43.70	68.35	1.49	36.08	12.98	0.54	27.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	98.11	11.01	3.85	78.69	102.77	9.34	89.73	63.54	69.49	56.18	70.65	65.57
Movement LOS	F	B	A	E	F	A	F	E	E	E	E	E
d_A, Approach Delay [s/veh]	14.69			94.57			84.99			62.43		
Approach LOS	B			F			F			E		
d_I, Intersection Delay [s/veh]	70.32											
Intersection LOS	E											
Intersection V/C	0.951											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	66.27	66.27	66.27	66.27
l_p,int, Pedestrian LOS Score for Intersection	4.389	4.216	2.775	2.363
Crosswalk LOS	E	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1227	1200	280	240
d_b, Bicycle Delay [s]	11.21	12.00	55.47	58.08
l_b,int, Bicycle LOS Score for Intersection	2.750	4.159	1.813	1.695
Bicycle LOS	C	D	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	Two-way stop	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.214

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	30.00	3.00	10.00	1.00	1.00	25.00	2.00	1.00	2.00	9.00	21.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	12	106	59	19	17	5	134	17	94	176	22
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	29	16	5	5	1	36	5	26	48	6
Total Analysis Volume [veh/h]	8	13	115	64	21	18	5	146	18	102	191	24
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.05	0.00	0.00	0.01	0.25	0.02	0.21	0.32	0.03
d_M, Delay for Movement [s/veh]	7.45	0.00	0.00	7.67	0.00	0.00	16.38	13.56	10.78	19.63	18.04	8.92
Movement LOS	A	A	A	A	A	A	C	B	B	C	C	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.14	0.14	0.14	1.15	1.15	1.15	3.08	3.08	0.08
95th-Percentile Queue Length [m/ln]	0.12	0.12	0.12	1.09	1.09	1.09	8.79	8.79	8.79	23.50	23.50	0.60
d_A, Approach Delay [s/veh]	0.44			4.77			13.35			17.86		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	11.68											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	133.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.436

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	24	8	1420	1125	6
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	7	2	386	306	2
Total Analysis Volume [veh/h]	17	26	9	1543	1223	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.44	0.06	0.02	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	132.99	49.02	13.47	0.00	0.00	0.00
Movement LOS	F	E	B	A	A	A
95th-Percentile Queue Length [veh/ln]	2.13	2.13	0.06	0.03	0.00	0.00
95th-Percentile Queue Length [m/ln]	16.24	16.24	0.48	0.24	0.00	0.00
d_A, Approach Delay [s/veh]	82.22		0.08		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	1.29					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	310.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.711

Intersection Setup

Name	Dupuy Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Dupuy Ave		Marion St		Marion St	
Base Volume Input [veh/h]	12	9	5	1275	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	58.00	2.00	60.00	3.00	3.00	56.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	10	6	1485	1178	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	3	2	404	320	3
Total Analysis Volume [veh/h]	15	11	7	1614	1280	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.71	0.03	0.02	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	310.03	148.04	17.10	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	2.60	2.60	0.07	0.04	0.00	0.00
95th-Percentile Queue Length [m/ln]	19.79	19.79	0.54	0.27	0.00	0.00
d_A, Approach Delay [s/veh]	241.50		0.07		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	2.18					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.481

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	4.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	278	1219	800	0	0	252
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	331	217	0	0	68
Total Analysis Volume [veh/h]	302	1325	870	0	0	274
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.40	0.01	0.01	0.00	0.00	0.48
d_M, Delay for Movement [s/veh]	12.76	0.00	0.00	0.00	0.00	17.06
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	1.90	0.95	0.00	0.00	0.00	2.60
95th-Percentile Queue Length [m/ln]	14.46	7.23	0.00	0.00	0.00	19.83
d_A, Approach Delay [s/veh]	2.37		0.00		17.06	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.08					
Intersection LOS	C					

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Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.716

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	1.00	1.00	4.00	4.00	4.00	14.00	8.00	11.00	7.00	1.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	961	254	3	640	33	161	100	30	66	204	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	261	69	1	174	9	44	27	8	18	55	0
Total Analysis Volume [veh/h]	3	1045	276	3	696	36	175	109	33	72	222	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			0			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			0			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	37	0	0	37	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	31	31	31	31	27	27	27
g / C, Green / Cycle	0.44	0.44	0.44	0.44	0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.39	0.39	0.22	0.22	0.33	0.06	0.12
s, saturation flow rate [veh/h]	1853	1563	1712	1645	972	1156	1795
c, Capacity [veh/h]	872	692	810	729	455	142	692
d1, Uniform Delay [s]	17.68	17.80	13.68	13.91	22.17	14.88	15.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.51	14.91	1.90	2.39	8.56	12.31	1.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.88	0.46	0.49	0.70	0.51	0.32
d, Delay for Lane Group [s/veh]	26.19	32.71	15.58	16.30	30.74	27.19	16.29
Lane Group LOS	C	C	B	B	C	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	10.93	10.47	4.01	4.00	5.49	1.19	2.45
50th-Percentile Queue Length [m/ln]	83.26	79.76	30.57	30.47	41.86	9.10	18.64
95th-Percentile Queue Length [veh/ln]	16.35	15.77	7.22	7.20	9.34	2.15	4.40
95th-Percentile Queue Length [m/ln]	124.57	120.19	55.03	54.84	71.15	16.38	33.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.19	28.27	32.71	15.58	15.92	16.30	30.74	30.74	30.74	27.19	16.29	16.29
Movement LOS	C	C	C	B	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	29.19			15.93			30.74			18.96		
Approach LOS	C			B			C			B		
d_I, Intersection Delay [s/veh]	24.60											
Intersection LOS	C											
Intersection V/C	0.716											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.436	3.139	0.000	0.000
Crosswalk LOS	C	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	886	886	771	771
d_b, Bicycle Delay [s]	10.86	10.86	13.21	13.21
l_b,int, Bicycle LOS Score for Intersection	2.652	2.166	2.083	2.045
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.266

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	4.00	2.00	9.00	2.00	38.00	1.00	20.00	6.00	1.00	3.00	9.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	252	0	50	202	19	0	99	37	26	221	50
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	68	0	14	55	5	0	27	10	7	60	14
Total Analysis Volume [veh/h]	29	274	0	54	220	21	0	108	40	28	240	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	34	0	0	34	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	20	20	20
g / C, Green / Cycle	0.47	0.47	0.47	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.02	0.10	0.10	0.10
s, saturation flow rate [veh/h]	1790	1712	1130	1527	1773	1588
c, Capacity [veh/h]	901	871	527	569	661	529
d1, Uniform Delay [s]	10.22	10.00	8.69	14.76	14.69	14.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.01	0.95	0.14	1.11	0.95	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.31	0.04	0.26	0.26	0.29
d, Delay for Lane Group [s/veh]	11.22	10.94	8.84	15.87	15.63	16.09
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.31	2.05	0.14	1.47	1.66	1.52
50th-Percentile Queue Length [m/ln]	17.61	15.63	1.08	11.20	12.64	11.57
95th-Percentile Queue Length [veh/ln]	4.16	3.69	0.26	2.64	2.99	2.73
95th-Percentile Queue Length [m/ln]	31.70	28.13	1.95	20.15	22.76	20.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.22	11.22	0.00	10.94	10.94	8.84	15.87	15.87	15.87	15.63	15.82	16.09
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	11.22			10.79			15.87			15.85		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.14											
Intersection LOS	B											
Intersection V/C	0.266											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	933	667	667
d_b, Bicycle Delay [s]	8.53	8.53	13.33	13.33
l_b,int, Bicycle LOS Score for Intersection	2.060	2.046	1.804	1.825
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	108.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.133

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	1	990	783	1	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	5.00	5.00	1.00	2.00	1.00	2.00	1.00	1.00	2.00	7.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	467	75	87	919	100	1	1153	912	1	987	115
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.8500	0.9200	0.9200	0.8500	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	96	127	20	24	250	27	0	313	248	0	268	31
Total Analysis Volume [veh/h]	386	508	82	95	999	109	1	1253	991	1	1073	125
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			1		
v_co, Outbound Pedestrian Volume crossing	0			0			5			8		
v_ci, Inbound Pedestrian Volume crossing mi	8			5			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	32	59	0	15	42	0	0	76	0	0	76	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	26	53	9	36	36	70	70	70	70
g / C, Green / Cycle	0.17	0.35	0.06	0.24	0.24	0.47	0.47	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.22	0.33	0.05	0.30	0.30	0.35	0.62	0.32	0.33
s, saturation flow rate [veh/h]	1795	1811	1738	1885	1821	3560	1602	1870	1804
c, Capacity [veh/h]	311	640	104	452	437	1662	748	873	842
d1, Uniform Delay [s]	62.00	46.52	70.10	57.00	57.00	32.92	40.00	31.39	31.94
k, delay calibration	0.46	0.39	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	130.89	17.33	23.90	127.57	129.07	3.23	155.64	4.38	5.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.24	0.92	0.91	1.24	1.25	0.75	1.33	0.69	0.71
d, Delay for Lane Group [s/veh]	192.89	63.86	94.00	184.57	186.07	36.15	195.64	35.77	37.02
Lane Group LOS	F	E	F	F	F	D	F	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	23.07	23.85	4.31	32.97	32.03	19.12	58.98	17.81	18.24
50th-Percentile Queue Length [m/ln]	175.79	181.73	32.81	251.21	244.04	145.70	449.39	135.74	138.95
95th-Percentile Queue Length [veh/ln]	34.28	31.86	7.71	47.77	46.57	26.29	86.39	24.73	25.24
95th-Percentile Queue Length [m/ln]	261.24	242.76	58.74	363.97	354.90	200.34	658.30	188.48	192.32

Movement, Approach, & Intersection Results

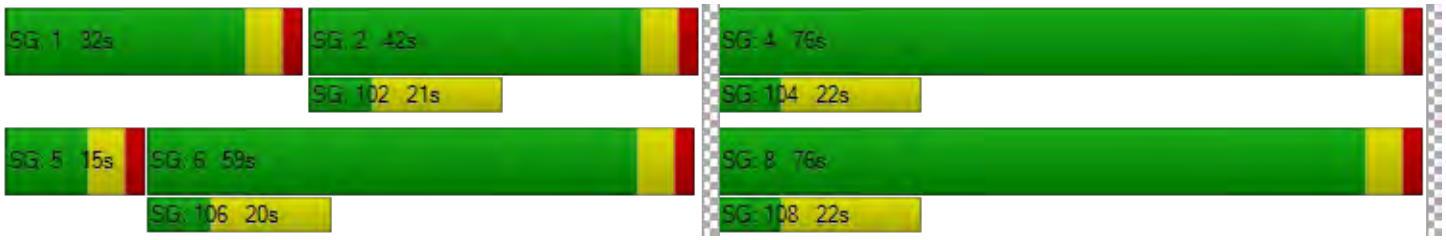
d_M, Delay for Movement [s/veh]	192.89	63.86	63.86	94.00	185.22	186.07	0.00	36.15	195.64	0.00	36.32	37.02
Movement LOS	F	E	E	F	F	F		D	F		D	D
d_A, Approach Delay [s/veh]	114.89			178.10			106.58			36.39		
Approach LOS	F			F			F			D		
d_I, Intersection Delay [s/veh]	108.37											
Intersection LOS	F											
Intersection V/C	1.133											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	3.295	2.935	3.491	3.188
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	707	480	933	933
d_b, Bicycle Delay [s]	31.36	43.32	21.33	21.33
l_b,int, Bicycle LOS Score for Intersection	3.170	2.552	3.411	2.548
Bicycle LOS	C	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 11 AM Peak 2030 BG Mitig. 1

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7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.720	27.0	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.674	24.5	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	WB Thru	0.301	9.9	A
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.311	200.2	F
13	Marion & Dupuy	Two-way stop	HCM 6th Edition	SB Left	0.698	318.4	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	EB Left	0.614	23.7	C
15	Marion & Dawson	Signalized	HCM 6th Edition	NWB Left	0.570	20.4	C
16	Dawson & Panet	Signalized	HCM 6th Edition	NEB Thru	0.407	14.4	B
19	Archibald & Marion	Signalized	HCM 6th Edition	SB Left	0.708	29.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.720

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	2	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	560	1626	1590	659	587	69
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	152	442	432	179	160	19
Total Analysis Volume [veh/h]	609	1767	1728	716	638	75
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	6	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	46	78	32	32	32	32
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	19	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	Yes	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	22	72	44	76	26	54
g / C, Green / Cycle	0.20	0.65	0.40	0.69	0.24	0.50
(v / s)_i Volume / Saturation Flow Rate	0.17	0.35	0.35	0.45	0.19	0.06
s, saturation flow rate [veh/h]	3486	5012	4889	1589	3320	1359
c, Capacity [veh/h]	714	3281	1932	1090	785	674
d1, Uniform Delay [s]	42.13	10.14	31.12	9.86	39.70	14.80
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.02	0.64	6.89	3.10	2.10	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.54	0.89	0.66	0.81	0.11
d, Delay for Lane Group [s/veh]	45.15	10.78	38.01	12.96	41.81	14.87
Lane Group LOS	D	B	D	B	D	B
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.87	6.36	14.32	8.50	8.29	1.00
50th-Percentile Queue Length [m/ln]	59.99	48.45	109.12	64.75	63.13	7.66
95th-Percentile Queue Length [veh/ln]	12.47	10.49	20.53	13.28	13.01	1.81
95th-Percentile Queue Length [m/ln]	95.06	79.96	156.40	101.17	99.11	13.78

Movement, Approach, & Intersection Results

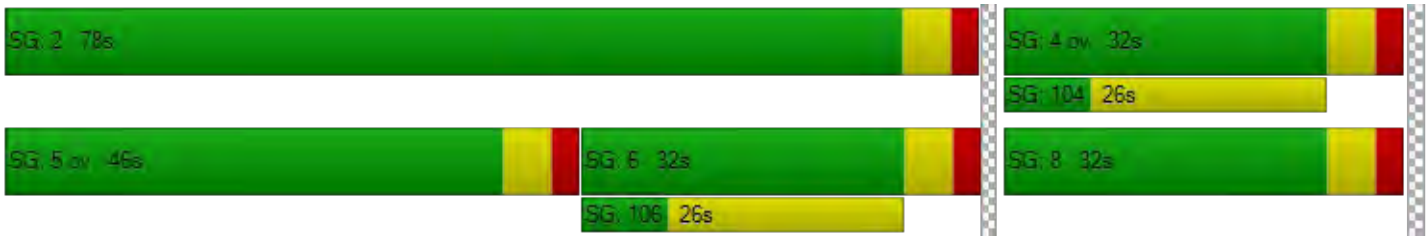
d_M, Delay for Movement [s/veh]	45.15	10.78	38.01	12.96	41.81	14.87
Movement LOS	D	B	D	B	D	B
d_A, Approach Delay [s/veh]	19.59		30.67		38.97	
Approach LOS	B		C		D	
d_I, Intersection Delay [s/veh]	26.98					
Intersection LOS	C					
Intersection V/C	0.720					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	0.00	44.55
l_p,int, Pedestrian LOS Score for Intersection	4.093	0.000	2.972
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	5.439	5.477	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	24.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	2.00	3.00	1.00	6.00	8.00	6.00	4.00	47.00	1.00	1.00	3.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	2197	40	90	1328	211	312	28	23	35	2	78
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	597	11	24	361	57	85	8	6	10	1	21
Total Analysis Volume [veh/h]	68	2388	43	98	1443	229	339	30	25	38	2	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	39	63	11	14	38	0	18	22	0	11	15	14
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	6	62	71	8	63	63	12	13	13	23	5	18
g / C, Green / Cycle	0.06	0.56	0.65	0.07	0.57	0.57	0.11	0.12	0.12	0.21	0.04	0.17
(v / s)_i Volume / Saturation Flow Rate	0.05	0.47	0.03	0.05	0.29	0.15	0.10	0.02	0.02	0.03	0.00	0.05
s, saturation flow rate [veh/h]	1509	5094	1577	1795	4930	1513	3348	1840	1574	1502	1885	1577
c, Capacity [veh/h]	86	2861	1021	123	2825	867	365	221	189	389	80	261
d1, Uniform Delay [s]	51.19	19.89	7.02	50.49	14.18	11.82	48.57	43.24	43.28	35.42	50.47	40.48
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	14.47	3.05	0.08	11.13	0.66	0.74	10.42	0.26	0.33	0.11	0.12	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.83	0.04	0.80	0.51	0.26	0.93	0.13	0.14	0.10	0.02	0.33
d, Delay for Lane Group [s/veh]	65.67	22.94	7.10	61.62	14.85	12.56	59.00	43.50	43.60	35.52	50.59	41.20
Lane Group LOS	E	C	A	E	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.13	15.20	0.33	2.94	6.46	2.67	5.11	0.72	0.65	0.84	0.06	2.08
50th-Percentile Queue Length [m/ln]	16.24	115.85	2.52	22.39	49.22	20.37	38.94	5.49	4.97	6.40	0.42	15.85
95th-Percentile Queue Length [veh/ln]	3.84	21.60	0.60	5.29	10.63	4.81	8.82	1.30	1.17	1.51	0.10	3.74
95th-Percentile Queue Length [m/ln]	29.23	164.58	4.54	40.31	80.98	36.67	67.18	9.88	8.95	11.52	0.76	28.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.67	22.94	7.10	61.62	14.85	12.56	59.00	43.51	43.60	35.52	50.59	41.20
Movement LOS	E	C	A	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	23.83			17.14			56.84			39.62		
Approach LOS	C			B			E			D		
d_I, Intersection Delay [s/veh]	24.48											
Intersection LOS	C											
Intersection V/C	0.674											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	4.044	4.032	2.767	2.406
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1036	582	291	164
d_b, Bicycle Delay [s]	12.77	27.65	40.16	46.37
l_b,int, Bicycle LOS Score for Intersection	2.934	2.533	1.885	1.766
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.301

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	6.00	1.00	15.00	1.00	13.00	1.00	6.00	1.00	1.00	8.00	6.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	19	176	38	6	9	24	143	9	80	89	101
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	49	11	2	3	7	40	3	22	25	28
Total Analysis Volume [veh/h]	6	21	196	42	7	10	27	159	10	89	99	112
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	762	627	691	624	743
Degree of Utilization, x	0.29	0.09	0.28	0.30	0.15

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.22	0.31	1.17	1.27	0.53
95th-Percentile Queue Length [m]	9.30	2.36	8.89	9.64	4.03
Approach Delay [s/veh]	9.67	9.33	10.27	10.00	
Approach LOS	A	A	B	A	
Intersection Delay [s/veh]	9.92				
Intersection LOS	A				

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	200.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.311

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	8	36	1114	1235	26
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	9	293	325	7
Total Analysis Volume [veh/h]	7	8	38	1173	1300	27
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.31	0.02	0.07	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	200.18	49.03	12.44	0.00	0.00	0.00
Movement LOS	F	E	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.14	1.14	0.23	0.12	0.00	0.00
95th-Percentile Queue Length [m/ln]	8.69	8.69	1.79	0.89	0.00	0.00
d_A, Approach Delay [s/veh]	119.56		0.39		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	0.89					
Intersection LOS	F					

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Intersection Level Of Service Report

Intersection 13: Marion & Dupuy

Control Type:	Two-way stop	Delay (sec / veh):	318.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	11	0	11	15	915	0	0	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	13	0	13	17	1066	0	0	1268	19
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	3	0	3	4	281	0	0	334	5
Total Analysis Volume [veh/h]	0	0	0	14	0	14	18	1122	0	0	1335	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane	No			No								
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No			No								
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.70	0.00	0.06	0.05	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	88.81	143.62	12.64	318.41	275.57	153.30	14.67	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	B	F	F	F	B	A			A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	2.72	2.72	2.72	0.14	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	20.71	20.71	20.71	1.10	0.55	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	81.69			235.85			0.23			0.00		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	2.72											
Intersection LOS	F											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	23.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	4.00	4.00	2.00	5.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	271	796	1251	1	0	170
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	216	340	0	0	46
Total Analysis Volume [veh/h]	295	865	1360	1	0	185
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.61	0.01	0.01	0.00	0.00	0.48
d_M, Delay for Movement [s/veh]	23.68	0.00	0.00	0.00	0.00	22.60
Movement LOS	C	A	A	A		C
95th-Percentile Queue Length [veh/ln]	4.06	2.03	0.00	0.00	0.00	2.51
95th-Percentile Queue Length [m/ln]	30.93	15.47	0.00	0.00	0.00	19.11
d_A, Approach Delay [s/veh]	6.02		0.00		22.60	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.13					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Marion & Dawson

Control Type:	Signalized	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.570

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	6.00	6.00	1.00	4.00	1.00	3.00	8.00	40.00	13.00	20.00	1.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	607	181	1	995	115	256	264	6	8	103	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	165	49	0	270	31	70	72	2	2	28	0
Total Analysis Volume [veh/h]	9	660	197	1	1082	125	278	287	7	9	112	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			1			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	56.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	38	0	0	38	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	L	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	32	32	32	32	26	26	26	26
g / C, Green / Cycle	0.46	0.46	0.46	0.46	0.37	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.27	0.26	0.35	0.35	0.22	0.17	0.01	0.07
s, saturation flow rate [veh/h]	1752	1516	1839	1611	1269	1772	989	1597
c, Capacity [veh/h]	853	693	892	737	477	658	318	593
d1, Uniform Delay [s]	13.88	14.03	15.86	15.88	22.28	16.58	21.61	14.88
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.49	3.52	5.01	7.49	5.13	2.19	0.16	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.54	0.58	0.72	0.77	0.58	0.45	0.03	0.19
d, Delay for Lane Group [s/veh]	16.36	17.55	20.87	23.37	27.41	18.77	21.77	15.59
Lane Group LOS	B	B	C	C	C	B	C	B
Critical Lane Group	No	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	5.18	4.69	8.50	7.92	4.42	3.57	0.12	1.21
50th-Percentile Queue Length [m/ln]	39.44	35.72	64.79	60.32	33.65	27.24	0.94	9.24
95th-Percentile Queue Length [veh/ln]	8.91	8.24	13.28	12.53	7.86	6.43	0.22	2.18
95th-Percentile Queue Length [m/ln]	67.87	62.77	101.23	95.48	59.91	49.03	1.69	16.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.36	16.73	17.55	20.87	21.89	23.37	27.41	18.77	18.77	21.77	15.59	15.59
Movement LOS	B	B	B	C	C	C	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	16.91			22.04			22.97			16.05		
Approach LOS	B			C			C			B		
d_I, Intersection Delay [s/veh]	20.36											
Intersection LOS	C											
Intersection V/C	0.570											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.598	3.049	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	914	914	743	743
d_b, Bicycle Delay [s]	10.31	10.31	13.83	13.83
l_b,int, Bicycle LOS Score for Intersection	2.274	2.556	2.503	1.761
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.407

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	3.00	2.00	18.00	5.00	5.00	2.00	7.00	22.00	20.00	32.00	12.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	224	0	36	110	22	1	344	43	6	75	59
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	61	0	10	30	6	0	93	12	2	20	16
Total Analysis Volume [veh/h]	52	243	0	39	120	24	1	374	47	7	82	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	22	22	22	26	26	26
g / C, Green / Cycle	0.37	0.37	0.37	0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.17	0.09	0.02	0.24	0.06	0.06
s, saturation flow rate [veh/h]	1765	1676	1551	1760	1374	1115
c, Capacity [veh/h]	718	689	569	823	660	483
d1, Uniform Delay [s]	14.31	13.18	12.22	12.67	10.22	10.29
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.74	0.78	0.14	2.28	0.38	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.41	0.23	0.04	0.51	0.12	0.15
d, Delay for Lane Group [s/veh]	16.05	13.96	12.36	14.95	10.61	10.93
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.92	1.43	0.20	3.98	0.61	0.56
50th-Percentile Queue Length [m/ln]	22.27	10.88	1.53	30.32	4.66	4.27
95th-Percentile Queue Length [veh/ln]	5.26	2.57	0.36	7.16	1.10	1.01
95th-Percentile Queue Length [m/ln]	40.08	19.59	2.76	54.58	8.38	7.68

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.05	16.05	0.00	13.96	13.96	12.36	14.95	14.95	14.95	10.61	10.64	10.93
Movement LOS	B	B		B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	16.05			13.75			14.95			10.76		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.44											
Intersection LOS	B											
Intersection V/C	0.407											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	733	867	867
d_b, Bicycle Delay [s]	12.03	12.03	9.63	9.63
l_b,int, Bicycle LOS Score for Intersection	2.046	1.862	2.256	1.686
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.708

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	1	0	0	1	0	0	0
Pocket Length [m]	150.00	30.48	30.48	100.00	30.48	100.00	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	1.00	3.00	9.00	4.00	5.00	1.00	3.00	2.00	1.00	3.00	11.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	933	885	72	77	290	96	2	850	313	3	990	94
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9600	0.9200	0.9200	0.9600	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	254	240	20	21	79	26	1	231	85	1	269	26
Total Analysis Volume [veh/h]	1014	962	78	84	315	104	2	924	340	3	1076	102
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			8			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			8			8		
v_co, Outbound Pedestrian Volume crossing	0			0			8			1		
v_ci, Inbound Pedestrian Volume crossing mi	8			1			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	31	25	0	28	22	0	0	27	27	0	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	C	R	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	5.00	5.00	6.00	5.00	5.00	5.00	6.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	3.00	4.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	25	30	30	5	10	10	29	59	29	29
g / C, Green / Cycle	0.31	0.37	0.37	0.06	0.12	0.12	0.37	0.74	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.29	0.28	0.28	0.05	0.09	0.07	0.26	0.12	0.32	0.33
s, saturation flow rate [veh/h]	3486	1885	1836	1681	3503	1551	3532	2805	1855	1800
c, Capacity [veh/h]	1083	696	678	110	434	192	1291	2072	678	658
d1, Uniform Delay [s]	26.81	21.99	22.21	36.79	33.74	32.92	21.80	3.11	23.58	23.92
k, delay calibration	0.11	0.15	0.16	0.11	0.11	0.11	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.57	2.28	2.79	10.55	2.34	2.37	3.41	0.04	14.14	17.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.94	0.75	0.77	0.77	0.73	0.54	0.72	0.16	0.87	0.89
d, Delay for Lane Group [s/veh]	31.38	24.27	25.00	47.34	36.08	35.28	25.21	3.14	37.72	41.03
Lane Group LOS	C	C	C	D	D	D	C	A	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.34	8.19	8.36	1.88	2.95	1.94	7.42	0.51	12.05	12.65
50th-Percentile Queue Length [m/ln]	71.20	62.44	63.68	14.29	22.52	14.77	56.53	3.89	91.83	96.40
95th-Percentile Queue Length [veh/ln]	14.36	12.89	13.10	3.38	5.32	3.49	11.89	0.92	17.74	18.48
95th-Percentile Queue Length [m/ln]	109.39	98.21	99.81	25.72	40.53	26.59	90.57	7.01	135.21	140.84

Movement, Approach, & Intersection Results

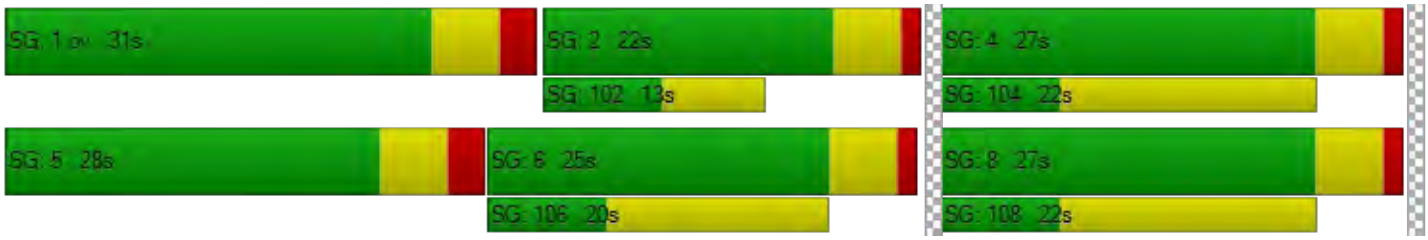
d_M, Delay for Movement [s/veh]	31.38	24.61	25.00	47.34	36.08	35.28	0.00	25.21	3.14	0.00	39.22	41.03
Movement LOS	C	C	C	D	D	D		C	A		D	D
d_A, Approach Delay [s/veh]	27.97			37.79			19.28			39.37		
Approach LOS	C			D			B			D		
d_I, Intersection Delay [s/veh]	29.45											
Intersection LOS	C											
Intersection V/C	0.708											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	3.216	2.974	3.376	3.041
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	425	550	550
d_b, Bicycle Delay [s]	22.50	24.81	21.03	21.03
l_b,int, Bicycle LOS Score for Intersection	3.254	1.975	2.602	2.531
Bicycle LOS	C	A	B	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Scenario 12 PM Peak 2030 BG Mitig. 1

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7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.734	28.4	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.709	21.6	C
9	Maginot & Speers	Two-way stop	HCM 6th Edition	WB Left	0.205	18.9	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	0.343	103.6	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	SB Left	1.538	877.6	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.481	17.1	C
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Left	0.543	20.6	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.266	13.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	SB Left	0.741	33.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.734

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	2	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	11.00	3.00	2.00	2.00	1.00	3.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	1424	2117	473	775	327
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	387	575	129	211	89
Total Analysis Volume [veh/h]	130	1548	2301	514	842	355
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		2	
v_di, Inbound Pedestrian Volume crossing m	2		0		0	
v_co, Outbound Pedestrian Volume crossing	0		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Split	Overlap
Signal group	5	2	6	6	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	15	66	51	51	34	34
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	5	7	7	7	0
Pedestrian Clearance [s]	0	10	19	19	21	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	Yes	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	9	61	46	79	27	42
g / C, Green / Cycle	0.09	0.61	0.46	0.79	0.27	0.42
(v / s)_i Volume / Saturation Flow Rate	0.04	0.31	0.45	0.32	0.24	0.23
s, saturation flow rate [veh/h]	3209	5053	5094	1589	3486	1575
c, Capacity [veh/h]	289	3082	2343	1255	942	662
d1, Uniform Delay [s]	43.15	10.97	26.60	3.26	35.12	21.70
k, delay calibration	0.11	0.50	0.50	0.46	0.11	0.24
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	0.59	14.85	0.92	3.27	1.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.50	0.98	0.41	0.89	0.54
d, Delay for Lane Group [s/veh]	44.25	11.56	41.45	4.17	38.39	23.18
Lane Group LOS	D	B	D	A	D	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.50	5.41	18.90	1.88	10.06	6.31
50th-Percentile Queue Length [m/ln]	11.43	41.20	144.04	14.32	76.66	48.11
95th-Percentile Queue Length [veh/ln]	2.70	9.22	26.03	3.38	15.26	10.43
95th-Percentile Queue Length [m/ln]	20.58	70.26	198.38	25.78	116.30	79.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.25	11.56	41.45	4.17	38.39	23.18
Movement LOS	D	B	D	A	D	C
d_A, Approach Delay [s/veh]	14.09		34.64		33.88	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	28.42					
Intersection LOS	C					
Intersection V/C	0.734					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61
l_p,int, Pedestrian LOS Score for Intersection	4.139	0.000	2.903
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	50.00	50.00	50.00
l_b,int, Bicycle LOS Score for Intersection	5.055	5.681	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	21.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.709

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	3.00	20.00	8.00	2.00	5.00	7.00	1.00	12.00	1.00	1.00	13.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	57	1259	12	16	2633	250	217	3	63	26	1	49
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	342	3	4	715	68	59	1	17	7	0	13
Total Analysis Volume [veh/h]	62	1368	13	17	2862	272	236	3	68	28	1	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	66	91	11	11	36	0	17	27	0	11	21	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	7	97	107	3	93	93	11	12	12	21	4	14
g / C, Green / Cycle	0.05	0.70	0.76	0.02	0.67	0.67	0.08	0.09	0.09	0.15	0.03	0.10
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.01	0.01	0.56	0.18	0.07	0.00	0.04	0.02	0.00	0.04
s, saturation flow rate [veh/h]	1509	5053	1360	1695	5094	1551	3320	1885	1602	1495	1885	1449
c, Capacity [veh/h]	78	3511	1035	40	3395	1034	261	163	139	253	60	142
d1, Uniform Delay [s]	65.61	8.94	4.02	67.43	17.78	9.45	63.98	58.51	61.01	51.12	65.68	59.12
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.04	0.33	0.02	7.09	2.74	0.62	11.23	0.04	2.67	0.19	0.11	1.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.39	0.01	0.43	0.84	0.26	0.90	0.02	0.49	0.11	0.02	0.37
d, Delay for Lane Group [s/veh]	81.65	9.26	4.04	74.52	20.52	10.07	75.21	58.56	63.68	51.31	65.79	60.74
Lane Group LOS	F	A	A	E	C	B	E	E	E	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.49	5.16	0.08	0.67	20.82	3.20	4.59	0.10	2.42	0.87	0.04	1.83
50th-Percentile Queue Length [m/ln]	18.97	39.31	0.60	5.07	158.63	24.39	34.95	0.76	18.42	6.61	0.28	13.97
95th-Percentile Queue Length [veh/ln]	4.48	8.88	0.14	1.20	28.30	5.76	8.10	0.18	4.35	1.56	0.07	3.30
95th-Percentile Queue Length [m/ln]	34.15	67.69	1.08	9.13	215.65	43.91	61.71	1.37	33.16	11.89	0.50	25.14

Movement, Approach, & Intersection Results

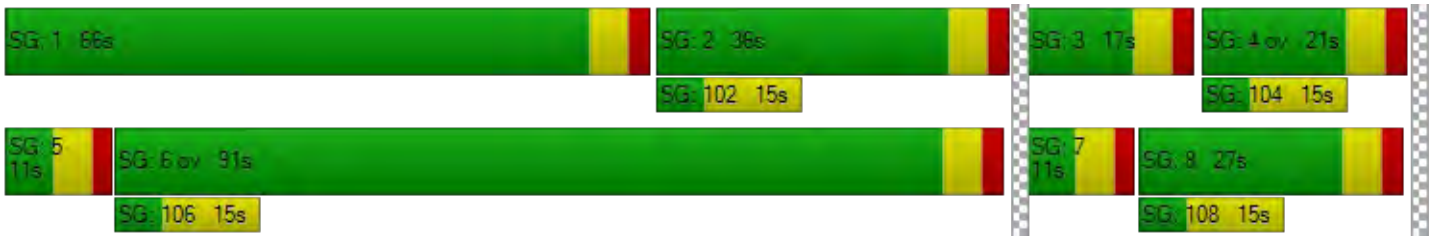
d_M, Delay for Movement [s/veh]	81.65	9.26	4.04	74.52	20.52	10.07	75.21	58.56	63.68	51.31	65.79	60.74
Movement LOS	F	A	A	E	C	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	12.33			19.91			72.49			57.58		
Approach LOS	B			B			E			E		
d_I, Intersection Delay [s/veh]	21.57											
Intersection LOS	C											
Intersection V/C	0.709											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	61.29	61.29	61.29	61.29
l_p,int, Pedestrian LOS Score for Intersection	4.182	4.099	2.771	2.360
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1214	429	300	214
d_b, Bicycle Delay [s]	10.80	43.21	50.58	55.80
l_b,int, Bicycle LOS Score for Intersection	2.353	3.293	1.813	1.695
Bicycle LOS	B	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	Two-way stop	Delay (sec / veh):	18.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.205

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	30.00	3.00	10.00	1.00	1.00	25.00	2.00	1.00	2.00	9.00	21.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	12	106	59	19	17	5	134	17	94	176	22
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	28	16	5	5	1	36	5	25	47	6
Total Analysis Volume [veh/h]	7	13	113	63	20	18	5	143	18	100	187	23
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.24	0.02	0.21	0.31	0.02
d_M, Delay for Movement [s/veh]	7.44	0.00	0.00	7.67	0.00	0.00	16.04	13.38	10.66	18.93	17.43	8.91
Movement LOS	A	A	A	A	A	A	C	B	B	C	C	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.01	0.14	0.14	0.14	1.11	1.11	1.11	2.90	2.90	0.07
95th-Percentile Queue Length [m/ln]	0.11	0.11	0.11	1.07	1.07	1.07	8.45	8.45	8.45	22.09	22.09	0.57
d_A, Approach Delay [s/veh]	0.39			4.78			13.16			17.28		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	11.38											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	103.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.343

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	21.00	5.00	29.00	3.00	2.00	1.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	24	8	1420	1125	6
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	6	2	366	290	2
Total Analysis Volume [veh/h]	16	25	8	1464	1160	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.34	0.06	0.02	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	103.58	34.51	12.92	0.00	0.00	0.00
Movement LOS	F	D	B	A	A	A
95th-Percentile Queue Length [veh/ln]	1.64	1.64	0.05	0.03	0.00	0.00
95th-Percentile Queue Length [m/ln]	12.50	12.50	0.40	0.20	0.00	0.00
d_A, Approach Delay [s/veh]	61.46		0.07		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	0.98					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	877.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.538

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	12	0	9	5	1275	0	0	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	58.00	33.00	2.00	60.00	3.00	2.00	2.00	3.00	56.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	14	0	10	6	1485	0	0	1178	10
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	4	0	3	2	432	0	0	342	3
Total Analysis Volume [veh/h]	0	0	0	16	0	12	7	1727	0	0	1370	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane	No			No								
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No			No								
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	1.54	0.00	0.03	0.03	0.02	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	237.19	347.00	17.09	877.62	1115.56	540.87	18.47	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	C	F	F	F	C	A			A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	3.94	3.94	3.94	0.08	0.04	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	30.00	30.00	30.00	0.60	0.30	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	200.43			733.30			0.07			0.00		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	6.57											
Intersection LOS	F											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.481

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	3.00	4.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	278	1219	800	0	0	252
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	331	217	0	0	68
Total Analysis Volume [veh/h]	302	1325	870	0	0	274
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.40	0.01	0.01	0.00	0.00	0.48
d_M, Delay for Movement [s/veh]	12.76	0.00	0.00	0.00	0.00	17.06
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	1.90	0.95	0.00	0.00	0.00	2.60
95th-Percentile Queue Length [m/ln]	14.46	7.23	0.00	0.00	0.00	19.83
d_A, Approach Delay [s/veh]	2.37		0.00		17.06	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.08					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	20.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.543

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	1.00	1.00	4.00	4.00	4.00	14.00	8.00	11.00	7.00	1.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	961	254	3	640	33	161	100	30	66	204	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	261	69	1	174	9	44	27	8	18	55	0
Total Analysis Volume [veh/h]	3	1045	276	3	696	36	175	109	33	72	222	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			0			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			0			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	39	0	0	39	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	18	0	0	14	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	L	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	33	33	33	33	25	25	25	25
g / C, Green / Cycle	0.47	0.47	0.47	0.47	0.36	0.36	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.39	0.39	0.21	0.21	0.15	0.09	0.06	0.12
s, saturation flow rate [veh/h]	1853	1563	1830	1644	1139	1623	1155	1795
c, Capacity [veh/h]	925	737	915	775	374	580	411	641
d1, Uniform Delay [s]	15.91	16.02	12.38	12.40	24.02	15.85	20.06	16.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.25	10.28	1.44	1.88	4.17	1.00	0.93	1.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.83	0.42	0.45	0.47	0.24	0.18	0.35
d, Delay for Lane Group [s/veh]	22.16	26.30	13.82	14.28	28.19	16.86	20.99	17.99
Lane Group LOS	C	C	B	B	C	B	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	9.82	9.15	3.83	3.52	2.83	1.61	0.95	2.62
50th-Percentile Queue Length [m/ln]	74.86	69.72	29.17	26.83	21.58	12.24	7.27	19.93
95th-Percentile Queue Length [veh/ln]	14.96	14.11	6.89	6.34	5.10	2.89	1.72	4.71
95th-Percentile Queue Length [m/ln]	114.03	107.52	52.50	48.29	38.85	22.04	13.08	35.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.16	23.48	26.30	13.82	14.03	14.28	28.19	16.86	16.86	20.99	17.99	17.99
Movement LOS	C	C	C	B	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	24.06			14.04			23.11			18.72		
Approach LOS	C			B			C			B		
d_I, Intersection Delay [s/veh]	20.60											
Intersection LOS	C											
Intersection V/C	0.543											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.86	24.86	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.436	3.139	0.000	0.000
Crosswalk LOS	C	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	943	943	714	714
d_b, Bicycle Delay [s]	9.78	9.78	14.46	14.46
l_b,int, Bicycle LOS Score for Intersection	2.652	2.166	2.083	2.045
Bicycle LOS	B	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.266

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	17.00	4.00	2.00	9.00	2.00	38.00	1.00	20.00	6.00	1.00	3.00	9.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	252	0	50	202	19	0	99	37	26	221	50
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	68	0	14	55	5	0	27	10	7	60	14
Total Analysis Volume [veh/h]	29	274	0	54	220	21	0	108	40	28	240	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	34	0	0	34	0	0	26	0	0	26	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	20	20	20
g / C, Green / Cycle	0.47	0.47	0.47	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.02	0.10	0.10	0.10
s, saturation flow rate [veh/h]	1790	1712	1130	1527	1773	1588
c, Capacity [veh/h]	901	871	527	569	661	529
d1, Uniform Delay [s]	10.22	10.00	8.69	14.76	14.69	14.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.01	0.95	0.14	1.11	0.95	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.31	0.04	0.26	0.26	0.29
d, Delay for Lane Group [s/veh]	11.22	10.94	8.84	15.87	15.63	16.09
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.31	2.05	0.14	1.47	1.66	1.52
50th-Percentile Queue Length [m/ln]	17.61	15.63	1.08	11.20	12.64	11.57
95th-Percentile Queue Length [veh/ln]	4.16	3.69	0.26	2.64	2.99	2.73
95th-Percentile Queue Length [m/ln]	31.70	28.13	1.95	20.15	22.76	20.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.22	11.22	0.00	10.94	10.94	8.84	15.87	15.87	15.87	15.63	15.82	16.09
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	11.22			10.79			15.87			15.85		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.14											
Intersection LOS	B											
Intersection V/C	0.266											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	933	933	667	667
d_b, Bicycle Delay [s]	8.53	8.53	13.33	13.33
l_b,int, Bicycle LOS Score for Intersection	2.060	2.046	1.804	1.825
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	33.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	1	0	0	2	0	0	1
Pocket Length [m]	150.00	30.48	30.48	100.00	30.48	100.00	30.48	30.48	100.00	30.48	30.48	50.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	1	990	783	1	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	3.00	5.00	5.00	1.00	2.00	1.00	2.00	1.00	1.00	2.00	7.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	467	75	87	919	100	1	1153	912	1	987	115
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.8500	0.9200	0.9200	0.8500	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	96	127	20	24	250	27	0	313	248	0	268	31
Total Analysis Volume [veh/h]	386	508	82	95	999	109	1	1253	991	1	1073	125
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			1		
v_co, Outbound Pedestrian Volume crossing	0			0			5			8		
v_ci, Inbound Pedestrian Volume crossing mi	8			5			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Split [s]	16	26	0	19	29	0	0	35	35	0	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	C	R	C	C
C, Cycle Length [s]	80	80	80	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	10	27	27	6	23	23	29	45	29	29
g / C, Green / Cycle	0.13	0.34	0.34	0.07	0.29	0.29	0.36	0.56	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.11	0.16	0.16	0.05	0.28	0.07	0.35	0.35	0.32	0.33
s, saturation flow rate [veh/h]	3486	1855	1766	1738	3589	1589	3560	2834	1870	1804
c, Capacity [veh/h]	436	631	601	126	1032	457	1291	1594	678	654
d1, Uniform Delay [s]	34.44	20.81	20.81	36.41	28.14	21.80	25.08	11.77	23.92	24.34
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.18	0.57	0.59	8.85	7.52	0.27	18.98	0.40	15.55	19.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.48	0.48	0.76	0.97	0.24	0.97	0.62	0.88	0.92
d, Delay for Lane Group [s/veh]	40.61	21.37	21.40	45.26	35.66	22.07	44.06	12.17	39.47	44.09
Lane Group LOS	D	C	C	D	D	C	D	B	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.90	4.22	4.03	2.06	9.81	1.51	13.99	5.05	12.58	13.41
50th-Percentile Queue Length [m/ln]	29.69	32.18	30.68	15.70	74.77	11.51	106.60	38.45	95.86	102.19
95th-Percentile Queue Length [veh/ln]	7.01	7.59	7.25	3.71	14.95	2.72	20.12	8.73	18.40	19.42
95th-Percentile Queue Length [m/ln]	53.44	57.86	55.22	28.26	113.91	20.72	153.34	66.52	140.19	147.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.61	21.38	21.40	45.26	35.66	22.07	0.00	44.06	12.17	0.00	41.51	44.09
Movement LOS	D	C	C	D	D	C		D	B		D	D
d_A, Approach Delay [s/veh]	28.99			35.18			29.98			41.78		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	33.44											
Intersection LOS	C											
Intersection V/C	0.741											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	29.76	29.76	29.76	29.76
l_p,int, Pedestrian LOS Score for Intersection	3.271	3.031	3.451	3.157
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	575	725	725
d_b, Bicycle Delay [s]	22.50	20.31	16.26	16.26
l_b,int, Bicycle LOS Score for Intersection	2.365	2.552	3.411	2.548
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190722_2030_AM_Scenarios_Market_Lands.vistro
Report File: V:\...\2030 Full BO No Mitig - AM.pdf

Scenario 1 AM Peak - 2030- no mitig - full BO
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.988	89.6	F
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	SB Left	0.887	55.0	D
9	Maginot & Speers	All-way stop	HCM 6th Edition	EB Thru	0.504	13.8	B
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	1.250	1,020.6	F
13	Dupuy & Marion	Two-way stop	HCM 6th Edition	NB Left	26.433	10,000.0	F
14	Marion & Panet	Two-way stop	HCM 6th Edition	EB Left	0.710	32.4	D
15	Dawson & Marion	Signalized	HCM 6th Edition	NWB Thru	0.856	36.6	D
16	Dawson & Panet	Signalized	HCM 6th Edition	NWB Thru	0.398	14.3	B
19	Archibald & Marion	Signalized	HCM 6th Edition	WB Right	1.196	154.3	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	89.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.988

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	40	3	25	171	84	34
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	600	1629	1615	830	671	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	163	443	439	226	182	28
Total Analysis Volume [veh/h]	652	1771	1755	902	729	112
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	27	78	51	32	32	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	72	72	45	77	26	26
g / C, Green / Cycle	0.65	0.65	0.41	0.70	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.81	0.51	0.51	0.57	0.26	0.27
s, saturation flow rate [veh/h]	803	3503	3418	1589	1709	1473
c, Capacity [veh/h]	510	2293	1398	1113	404	348
d1, Uniform Delay [s]	39.45	13.27	32.50	11.44	42.00	42.00
k, delay calibration	0.50	0.50	0.50	0.50	0.38	0.39
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	139.97	2.60	120.89	6.44	72.44	82.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.28	0.77	1.26	0.81	1.11	1.13
d, Delay for Lane Group [s/veh]	179.42	15.87	153.39	17.89	114.44	124.72
Lane Group LOS	F	B	F	B	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	24.65	12.96	40.36	13.23	18.92	17.30
50th-Percentile Queue Length [m/ln]	187.82	98.77	307.57	100.78	144.21	131.84
95th-Percentile Queue Length [veh/ln]	38.98	18.87	58.90	19.19	27.62	25.77
95th-Percentile Queue Length [m/ln]	297.02	143.76	448.83	146.22	210.43	196.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	179.42	15.87	153.39	17.89	118.46	124.72
Movement LOS	F	B	F	B	F	F
d_A, Approach Delay [s/veh]	59.88		107.39		119.24	
Approach LOS	E		F		F	
d_I, Intersection Delay [s/veh]	89.63					
Intersection LOS	F					
Intersection V/C	0.988					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	0.00	44.55
l_p,int, Pedestrian LOS Score for Intersection	4.540	0.000	3.510
Crosswalk LOS	E	F	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	6.131	6.324	5.520
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	55.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.887

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	46	34	0	0	37	40	10	0	36	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	2231	40	90	1365	251	322	28	59	35	2	78
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	606	11	24	371	68	88	8	16	10	1	21
Total Analysis Volume [veh/h]	118	2425	43	98	1484	273	350	30	64	38	2	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	30	89	11	15	74	0	21	25	0	11	15	15
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	140	140	140	140	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	11	87	97	9	85	85	15	16	16	26	5	20
g / C, Green / Cycle	0.08	0.62	0.69	0.06	0.61	0.61	0.11	0.11	0.11	0.18	0.03	0.14
(v / s)_i Volume / Saturation Flow Rate	0.07	0.68	0.03	0.06	0.42	0.17	0.10	0.02	0.04	0.03	0.00	0.05
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	3459	1870	1589	1448	1870	1589
c, Capacity [veh/h]	143	2216	1101	114	2159	964	371	214	182	297	65	226
d1, Uniform Delay [s]	63.40	26.43	6.79	64.86	18.60	13.10	62.09	55.81	57.22	47.64	65.29	54.46
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.18	50.37	0.07	16.16	1.81	0.74	12.05	0.30	1.16	0.19	0.19	1.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	1.09	0.04	0.86	0.69	0.28	0.94	0.14	0.35	0.13	0.03	0.38
d, Delay for Lane Group [s/veh]	74.58	76.80	6.85	81.02	20.41	13.83	74.14	56.11	58.38	47.83	65.48	55.50
Lane Group LOS	E	F	A	F	C	B	E	E	E	D	E	E
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.49	47.49	0.38	3.90	15.19	3.99	6.81	0.98	2.16	1.13	0.07	2.80
50th-Percentile Queue Length [m/ln]	34.20	361.87	2.90	29.69	115.79	30.43	51.89	7.46	16.46	8.64	0.55	21.33
95th-Percentile Queue Length [veh/ln]	7.96	63.51	0.69	7.01	21.59	7.19	11.09	1.76	3.89	2.04	0.13	5.04
95th-Percentile Queue Length [m/ln]	60.67	483.92	5.23	53.43	164.50	54.77	84.50	13.42	29.63	15.54	1.00	38.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	74.58	76.80	6.85	81.02	20.41	13.83	74.14	56.11	58.38	47.83	65.48	55.50
Movement LOS	E	F	A	F	C	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	75.54			22.65			70.65			53.33		
Approach LOS	E			C			E			D		
d_I, Intersection Delay [s/veh]	54.97											
Intersection LOS	D											
Intersection V/C	0.887											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	59.43	59.43	59.43	59.43
l_p,int, Pedestrian LOS Score for Intersection	4.289	4.181	2.801	2.417
Crosswalk LOS	E	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1186	971	271	129
d_b, Bicycle Delay [s]	11.60	18.51	52.29	61.29
l_b,int, Bicycle LOS Score for Intersection	3.693	3.090	1.926	1.766
Bicycle LOS	D	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.504

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	80	4	38	32	34	82	3	0	8	7	71
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	99	180	76	38	43	106	146	9	88	96	172
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	27	49	21	10	12	29	40	2	24	26	47
Total Analysis Volume [veh/h]	5	108	196	83	41	47	115	159	10	96	104	187
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	614	554	569	527	614
Degree of Utilization, x	0.50	0.31	0.50	0.38	0.30

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.84	1.30	2.77	1.76	1.28
95th-Percentile Queue Length [m]	21.61	9.93	21.12	13.40	9.79
Approach Delay [s/veh]	14.68	12.36	15.45	12.42	
Approach LOS	B	B	C	B	
Intersection Delay [s/veh]	13.77				
Intersection LOS	B				

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Version 7.00-03

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	1,020.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.250

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	413	292	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	9	36	1527	1527	27
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	10	415	415	7
Total Analysis Volume [veh/h]	8	10	39	1660	1660	29
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.25	0.03	0.10	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	1020.56	469.92	15.59	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	2.86	2.86	0.34	0.17	0.00	0.00
95th-Percentile Queue Length [m/ln]	21.77	21.77	2.60	1.30	0.00	0.00
d_A, Approach Delay [s/veh]	714.65		0.36		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	3.96					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report

Intersection 13: Dupuy & Marion

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	26.433

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	30.48	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	11	0	11	15	915	0	0	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	278	1	73	0	2	0	0	4	404	94	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	278	1	73	13	2	13	17	1070	404	94	1277	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	0	20	4	1	4	5	291	110	26	347	5
Total Analysis Volume [veh/h]	302	1	79	14	2	14	18	1163	439	102	1388	21
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	26.43	0.11	0.24	2.15	0.30	0.06	0.05	0.01	0.00	0.25	0.01	0.00
d_M, Delay for Movement [s/veh]	10000.0	411.13	24.35	1573.70	1568.94	1036.04	15.23	0.00	0.00	16.88	0.00	0.00
Movement LOS	F	F	C	F	F	F	C	A	A	C	A	A
95th-Percentile Queue Length [veh/ln]	39.21	1.51	1.51	4.67	4.67	4.67	0.15	0.00	0.00	0.99	0.00	0.00
95th-Percentile Queue Length [m/ln]	298.78	11.47	11.47	35.57	35.57	35.57	1.17	0.00	0.00	7.51	0.00	0.00
d_A, Approach Delay [s/veh]	7911.87			1322.48			0.17			1.14		
Approach LOS	F			F			A			A		
d_I, Intersection Delay [s/veh]	864.81											
Intersection LOS	F											

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Version 7.00-03

Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	136	214	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	273	932	1465	1	0	174
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	251	394	0	0	47
Total Analysis Volume [veh/h]	294	1002	1575	1	0	187
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.71	0.01	0.02	0.00	0.00	0.56
d_M, Delay for Movement [s/veh]	32.35	0.00	0.00	0.00	0.00	28.66
Movement LOS	D	A	A	A		D
95th-Percentile Queue Length [veh/ln]	5.41	2.70	0.00	0.00	0.00	3.24
95th-Percentile Queue Length [m/ln]	41.19	20.60	0.00	0.00	0.00	24.72
d_A, Approach Delay [s/veh]	7.34		0.00		28.66	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.86					
Intersection LOS	D					

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Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.856

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	118	18	0	212	0	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	725	199	1	1207	115	258	264	6	8	103	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	197	54	0	328	31	70	72	2	2	28	0
Total Analysis Volume [veh/h]	9	788	216	1	1312	125	280	287	7	9	112	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	36	0	0	36	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	30	30	30	30	28	28	28
g / C, Green / Cycle	0.43	0.43	0.43	0.43	0.40	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.35	0.35	0.41	0.41	0.45	0.01	0.06
s, saturation flow rate [veh/h]	1287	1593	1869	1648	1288	1085	1867
c, Capacity [veh/h]	604	683	853	706	592	103	747
d1, Uniform Delay [s]	16.32	17.62	19.28	19.38	24.32	12.82	13.41
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.32	10.61	13.75	24.94	30.33	1.67	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.82	0.89	0.96	0.97	0.09	0.15
d, Delay for Lane Group [s/veh]	24.64	28.23	33.04	44.33	54.65	14.49	13.84
Lane Group LOS	C	C	C	D	D	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.33	8.83	13.41	13.95	13.88	0.13	1.11
50th-Percentile Queue Length [m/ln]	48.21	67.27	102.15	106.31	105.74	0.95	8.43
95th-Percentile Queue Length [veh/ln]	10.45	13.70	19.41	20.08	19.99	0.23	1.99
95th-Percentile Queue Length [m/ln]	79.65	104.40	147.91	152.98	152.30	1.72	15.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.64	26.21	28.23	33.04	37.78	44.33	54.65	54.65	54.65	14.49	13.84	13.84
Movement LOS	C	C	C	C	D	D	D	D	D	B	B	B
d_A, Approach Delay [s/veh]	26.63			38.35			54.65			13.89		
Approach LOS	C			D			D			B		
d_I, Intersection Delay [s/veh]	36.60											
Intersection LOS	D											
Intersection V/C	0.856											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	26.58	26.58	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.789	3.226	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	857	857	800	800
d_b, Bicycle Delay [s]	11.43	11.43	12.60	12.60
l_b,int, Bicycle LOS Score for Intersection	2.395	2.746	2.507	1.761
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.398

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	1	0	0	2	0	0	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	225	0	36	112	22	1	344	43	6	75	61
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	61	0	10	30	6	0	93	12	2	20	17
Total Analysis Volume [veh/h]	53	245	0	39	122	24	1	374	47	7	82	66
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	29	0	0	29	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	23	23	25	25	25
g / C, Green / Cycle	0.38	0.38	0.38	0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.17	0.09	0.02	0.23	0.05	0.05
s, saturation flow rate [veh/h]	1777	1713	1589	1834	1812	1465
c, Capacity [veh/h]	752	731	609	824	820	610
d1, Uniform Delay [s]	13.57	12.48	11.58	13.26	10.68	10.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	0.69	0.12	2.27	0.25	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.22	0.04	0.51	0.10	0.12
d, Delay for Lane Group [s/veh]	15.13	13.18	11.70	15.53	10.93	11.13
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.83	1.39	0.19	4.09	0.62	0.56
50th-Percentile Queue Length [m/ln]	21.57	10.56	1.47	31.14	4.73	4.27
95th-Percentile Queue Length [veh/ln]	5.09	2.49	0.35	7.36	1.12	1.01
95th-Percentile Queue Length [m/ln]	38.82	19.00	2.64	56.05	8.51	7.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.13	15.13	0.00	13.18	13.18	11.70	15.53	15.53	15.53	10.93	10.94	11.13
Movement LOS	B	B		B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	15.13			12.99			15.53			11.02		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	14.31											
Intersection LOS	B											
Intersection V/C	0.398											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	767	767	833	833
d_b, Bicycle Delay [s]	11.41	11.41	10.21	10.21
l_b,int, Bicycle LOS Score for Intersection	2.051	1.865	2.256	1.687
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	154.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.196

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	170	88	0	0	0	154	0	1	228	63
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	933	885	242	165	290	96	2	1004	313	4	1218	157
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	254	240	66	45	79	26	1	273	85	1	331	43
Total Analysis Volume [veh/h]	1014	962	263	179	315	104	2	1091	340	4	1324	171
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	77	81	0	18	22	0	0	51	0	0	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	71	76	12	17	17	46	46	46	46
g / C, Green / Cycle	0.47	0.51	0.08	0.11	0.11	0.31	0.31	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.57	0.68	0.10	0.12	0.12	0.31	0.21	0.40	0.42
s, saturation flow rate [veh/h]	1781	1802	1781	1870	1714	3560	1589	1870	1797
c, Capacity [veh/h]	843	913	142	212	194	1092	487	573	551
d1, Uniform Delay [s]	39.50	37.00	69.00	66.50	66.50	51.98	45.86	52.00	52.00
k, delay calibration	0.50	0.50	0.11	0.13	0.14	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	102.57	161.25	127.47	38.16	43.91	27.05	8.04	148.93	171.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.20	1.34	1.26	1.03	1.04	1.00	0.70	1.30	1.36
d, Delay for Lane Group [s/veh]	142.07	198.25	196.47	104.66	110.41	79.03	53.90	200.93	223.85
Lane Group LOS	F	F	F	F	F	E	D	F	F
Critical Lane Group	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	54.00	72.98	10.48	10.31	9.76	24.29	12.19	44.96	46.72
50th-Percentile Queue Length [m/ln]	411.45	556.09	79.88	78.55	74.36	185.13	92.91	342.59	356.03
95th-Percentile Queue Length [veh/ln]	75.55	106.50	17.03	15.74	15.12	32.38	17.92	65.31	68.82
95th-Percentile Queue Length [m/ln]	575.72	811.54	129.75	119.96	115.21	246.72	136.55	497.69	524.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	142.07	198.25	198.25	196.47	106.44	110.41	0.00	79.03	53.90	0.00	210.91	223.85
Movement LOS	F	F	F	F	F	F		E	D		F	F
d_A, Approach Delay [s/veh]	172.80			134.08			73.06			212.39		
Approach LOS	F			F			E			F		
d_I, Intersection Delay [s/veh]	154.29											
Intersection LOS	F											
Intersection V/C	1.196											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	3.272	2.902	3.506	3.315
Crosswalk LOS	C	C	D	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1013	227	613	613
d_b, Bicycle Delay [s]	18.25	58.96	36.05	36.05
l_b,int, Bicycle LOS Score for Intersection	5.254	2.053	2.740	2.793
Bicycle LOS	F	B	B	C

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190722_2030_PM_Scenarios_Market_Lands.vistro
Scenario 1 PM Peak - 2030- no mitig - full BO
Report File: V:\...\2030 Full BO No Mitig - PM.pdf
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	EB Right	1.212	140.2	F
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	SB Thru	1.004	101.2	F
9	Maginot & Speers	All-way stop	HCM 6th Edition	SB Left	0.762	22.0	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	3.053	1,794.0	F
13	Dupuy & Marion	Signalized	HCM 6th Edition	SB Left	0.788	29.0	C
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.533	19.6	C
15	Dawson & Marion	Signalized	HCM 6th Edition	SEB Left	0.832	26.5	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.268	13.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Left	1.142	113.5	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	140.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.212

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	1	0	0	1	0	0
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	30.48
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.00	4.00	7.00	2.00	7.00	20.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	40	19	2	87	175	77
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	1443	2119	560	950	404
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	392	576	152	258	110
Total Analysis Volume [veh/h]	174	1568	2303	609	1033	439
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPerm	Permissive	Permissive	Overlap	Permissive	Permissive
Signal group	5	2	6	4	4	0
Auxiliary Signal Groups				4,6		
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	0
Maximum Green [s]	30	30	30	30	30	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	11	90	79	60	60	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0
Minimum Recall	No	No	No	No	No	
Maximum Recall	No	Yes	Yes	No	No	
Pedestrian Recall	No	No	No	No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	C
C, Cycle Length [s]	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	84	84	73	133	54	54
g / C, Green / Cycle	0.56	0.56	0.49	0.89	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.52	0.45	0.67	0.38	0.46	0.49
s, saturation flow rate [veh/h]	336	3503	3418	1589	1709	1416
c, Capacity [veh/h]	181	1962	1663	1409	615	510
d1, Uniform Delay [s]	58.01	26.28	38.50	1.56	48.00	48.00
k, delay calibration	0.50	0.50	0.50	0.49	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	57.10	3.52	176.92	0.95	131.75	174.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.96	0.80	1.38	0.43	1.26	1.36
d, Delay for Lane Group [s/veh]	115.11	29.80	215.42	2.52	179.75	222.87
Lane Group LOS	F	C	F	A	F	F
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.68	21.61	69.39	1.30	45.34	43.66
50th-Percentile Queue Length [m/ln]	43.28	164.69	528.79	9.94	345.52	332.66
95th-Percentile Queue Length [veh/ln]	9.59	29.24	102.90	2.35	65.38	65.32
95th-Percentile Queue Length [m/ln]	73.06	222.79	784.07	17.89	498.17	497.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	115.11	29.80	215.42	2.52	191.16	222.87
Movement LOS	F	C	F	A	F	F
d_A, Approach Delay [s/veh]	38.32		170.89		200.07	
Approach LOS	D		F		F	
d_I, Intersection Delay [s/veh]	140.21					
Intersection LOS	F					
Intersection V/C	1.212					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	0.00	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.656	0.000	3.195
Crosswalk LOS	E	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	75.00	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	5.570	6.535	6.561
Bicycle LOS	F	F	F

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	101.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.004

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	37	30	0	0	78	36	31	0	91	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	1289	12	16	2711	286	248	3	154	26	1	49
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	350	3	4	737	78	67	1	42	7	0	13
Total Analysis Volume [veh/h]	102	1401	13	17	2947	311	270	3	167	28	1	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	14	106	11	11	103	0	18	22	0	11	15	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	8	102	111	3	97	97	12	17	17	27	9	18
g / C, Green / Cycle	0.05	0.68	0.74	0.02	0.65	0.65	0.08	0.12	0.12	0.18	0.06	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.39	0.01	0.01	0.83	0.20	0.08	0.00	0.11	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	3459	1870	1589	1372	1870	1589
c, Capacity [veh/h]	95	2416	1179	40	2306	1029	277	217	184	190	110	193
d1, Uniform Delay [s]	71.00	12.77	5.04	72.38	26.43	11.58	68.86	58.72	65.50	52.21	66.44	59.90
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	64.11	1.02	0.02	7.10	128.61	0.76	20.00	0.03	15.06	0.35	0.03	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.07	0.58	0.01	0.43	1.28	0.30	0.98	0.01	0.91	0.15	0.01	0.27
d, Delay for Lane Group [s/veh]	135.11	13.79	5.06	79.48	155.03	12.33	88.85	58.74	80.56	52.56	66.48	60.66
Lane Group LOS	F	B	A	E	F	B	F	E	F	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.27	11.46	0.10	0.71	76.92	4.44	5.95	0.10	7.09	0.91	0.04	1.89
50th-Percentile Queue Length [m/ln]	40.16	87.31	0.74	5.43	586.09	33.82	45.36	0.79	54.05	6.92	0.28	14.38
95th-Percentile Queue Length [veh/ln]	9.22	17.01	0.18	1.28	110.50	7.89	9.95	0.19	11.46	1.63	0.07	3.40
95th-Percentile Queue Length [m/ln]	70.26	129.61	1.33	9.78	842.01	60.14	75.84	1.42	87.34	12.45	0.51	25.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	135.11	13.79	5.06	79.48	155.03	12.33	88.85	58.74	80.56	52.56	66.48	60.66
Movement LOS	F	B	A	E	F	B	F	E	F	D	E	E
d_A, Approach Delay [s/veh]	21.88			141.09			85.50			57.97		
Approach LOS	C			F			F			E		
d_I, Intersection Delay [s/veh]	101.19											
Intersection LOS	F											
Intersection V/C	1.004											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.501	4.276	2.807	2.362
Crosswalk LOS	E	E	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1333	1293	213	120
d_b, Bicycle Delay [s]	8.33	9.36	59.85	66.27
l_b,int, Bicycle LOS Score for Intersection	2.810	4.261	1.923	1.695
Bicycle LOS	C	E	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	22.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	61	7	110	88	88	62	6	0	17	17	39
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	73	113	169	107	105	67	140	17	111	193	61
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	20	31	46	29	29	18	38	5	30	52	17
Total Analysis Volume [veh/h]	8	79	123	184	116	114	73	152	18	121	210	66
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	517	543	493	480	546
Degree of Utilization, x	0.41	0.76	0.49	0.69	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.96	6.78	2.69	5.21	0.41
95th-Percentile Queue Length [m]	14.90	51.66	20.48	39.67	3.12
Approach Delay [s/veh]	14.66	27.82	17.21	22.73	
Approach LOS	B	D	C	C	
Intersection Delay [s/veh]	22.00				
Intersection LOS	C				

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	1,794.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.053

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	410	380	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	24	8	1830	1505	8
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	7	2	497	409	2
Total Analysis Volume [veh/h]	20	26	9	1989	1636	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	3.05	0.08	0.02	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	1794.03	1255.82	14.36	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	6.55	6.55	0.07	0.04	0.00	0.00
95th-Percentile Queue Length [m/ln]	49.91	49.91	0.53	0.27	0.00	0.00
d_A, Approach Delay [s/veh]	1489.83		0.06		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	18.61					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Signalized	Delay (sec / veh):	29.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	150.00	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	12	0	9	5	1275	0	0	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	358	2	143	0	2	0	1	19	389	82	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	27	0	9	0	0	0	0	13	16	29	-29	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	385	2	152	14	2	10	7	1517	405	111	1160	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	105	1	41	4	1	3	2	412	110	30	315	3
Total Analysis Volume [veh/h]	418	2	165	15	2	11	8	1649	440	121	1261	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	30	63	0	0	33	0	11	76	0	11	76	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	19	0	0	22	0	0	16	0	0	7	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	No		No	No	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	22	34	5	104	93	93	104	97	97
g / C, Green / Cycle	0.15	0.22	0.04	0.70	0.62	0.62	0.70	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.13	0.12	0.11	0.02	0.52	0.31	0.31	0.38	0.38
s, saturation flow rate [veh/h]	3113	1433	261	363	3179	1431	387	1656	1651
c, Capacity [veh/h]	460	322	46	248	1978	890	227	1070	1067
d1, Uniform Delay [s]	62.94	51.05	73.26	10.85	22.25	15.47	29.26	15.27	15.28
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.22	1.30	11.88	0.24	4.32	1.96	8.71	2.44	2.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.91	0.52	0.60	0.03	0.83	0.49	0.53	0.60	0.60
d, Delay for Lane Group [s/veh]	70.16	52.35	85.13	11.09	26.57	17.43	37.97	17.71	17.73
Lane Group LOS	E	D	F	B	C	B	D	B	B
Critical Lane Group	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.33	5.67	1.25	0.09	22.61	8.43	1.79	12.63	12.61
50th-Percentile Queue Length [m/ln]	63.45	43.24	9.56	0.71	172.28	64.24	13.60	96.26	96.08
95th-Percentile Queue Length [veh/ln]	13.06	9.58	2.26	0.17	30.41	13.19	3.21	18.46	18.43
95th-Percentile Queue Length [m/ln]	99.51	73.01	17.21	1.27	231.70	100.52	24.49	140.68	140.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	70.16	52.35	52.35	85.13	85.13	85.13	11.09	26.57	17.43	37.97	17.72	17.73
Movement LOS	E	D	D	F	F	F	B	C	B	D	B	B
d_A, Approach Delay [s/veh]	65.08			85.13			24.59			19.48		
Approach LOS	E			F			C			B		
d_I, Intersection Delay [s/veh]	29.04											
Intersection LOS	C											
Intersection V/C	0.788											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	66.27	66.27	66.27	66.27
l_p,int, Pedestrian LOS Score for Intersection	2.808	1.788	3.709	3.603
Crosswalk LOS	C	A	D	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	760	360	933	933
d_b, Bicycle Delay [s]	28.83	50.43	21.33	21.33
l_b,int, Bicycle LOS Score for Intersection	2.525	1.606	3.290	2.709
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	288	130	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	283	1507	930	0	0	256
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	405	250	0	0	69
Total Analysis Volume [veh/h]	304	1620	1000	0	0	275
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.44	0.02	0.01	0.00	0.00	0.53
d_M, Delay for Movement [s/veh]	14.31	0.00	0.00	0.00	0.00	19.64
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	2.27	1.13	0.00	0.00	0.00	3.10
95th-Percentile Queue Length [m/ln]	17.28	8.64	0.00	0.00	0.00	23.63
d_A, Approach Delay [s/veh]	2.26		0.00		19.64	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.05					
Intersection LOS	C					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	254	34	0	127	0	3	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	1215	288	3	767	33	164	100	30	66	204	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	330	78	1	208	9	45	27	8	18	55	0
Total Analysis Volume [veh/h]	4	1321	313	3	834	36	178	109	33	72	222	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	50	0	0	50	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	44	44	44	44	24	24	24
g / C, Green / Cycle	0.55	0.55	0.55	0.55	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.47	0.48	0.25	0.25	0.35	0.06	0.12
s, saturation flow rate [veh/h]	1866	1587	1859	1676	914	1246	1870
c, Capacity [veh/h]	1072	873	1067	922	344	90	561
d1, Uniform Delay [s]	15.19	15.64	10.74	10.76	32.51	21.86	22.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.81	12.05	1.27	1.58	33.60	51.05	2.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.88	0.43	0.45	0.93	0.80	0.40
d, Delay for Lane Group [s/veh]	22.00	27.69	12.00	12.34	66.12	72.91	24.33
Lane Group LOS	C	C	B	B	E	E	C
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.13	12.95	4.50	4.13	9.29	2.27	3.43
50th-Percentile Queue Length [m/ln]	100.05	98.69	34.32	31.51	70.81	17.28	26.17
95th-Percentile Queue Length [veh/ln]	19.07	18.85	7.99	7.44	14.29	4.08	6.18
95th-Percentile Queue Length [m/ln]	145.33	143.67	60.85	56.71	108.90	31.10	47.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.00	23.95	27.69	12.00	12.15	12.34	66.12	66.12	66.12	72.91	24.33	24.33
Movement LOS	C	C	C	B	B	B	E	E	E	E	C	C
d_A, Approach Delay [s/veh]	24.66			12.16			66.12			36.22		
Approach LOS	C			B			E			D		
d_I, Intersection Delay [s/veh]	26.50											
Intersection LOS	C											
Intersection V/C	0.832											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	31.51	31.51	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.672	3.350	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1100	1100	600	600
d_b, Bicycle Delay [s]	8.10	8.10	19.60	19.60
l_b,int, Bicycle LOS Score for Intersection	2.911	2.280	2.088	2.045
Bicycle LOS	C	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.268

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	2	0	0	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	255	0	50	204	19	0	99	37	26	221	52
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	69	0	14	55	5	0	27	10	7	60	14
Total Analysis Volume [veh/h]	33	277	0	54	222	21	0	108	40	28	240	57
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	0	0	35	0	0	25	0	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	19	19	19
g / C, Green / Cycle	0.48	0.48	0.48	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.01	0.08	0.10	0.10
s, saturation flow rate [veh/h]	1809	1709	1589	1785	1791	1596
c, Capacity [veh/h]	941	898	768	625	637	505
d1, Uniform Delay [s]	9.60	9.39	8.12	15.27	15.43	15.49
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.94	0.89	0.07	0.89	1.05	1.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.31	0.03	0.24	0.27	0.30
d, Delay for Lane Group [s/veh]	10.54	10.28	8.18	16.17	16.48	17.02
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.25	1.97	0.13	1.47	1.74	1.59
50th-Percentile Queue Length [m/ln]	17.15	15.00	0.98	11.23	13.26	12.13
95th-Percentile Queue Length [veh/ln]	4.05	3.54	0.23	2.65	3.13	2.86
95th-Percentile Queue Length [m/ln]	30.87	27.00	1.77	20.22	23.87	21.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.54	10.54	0.00	10.28	10.28	8.18	16.17	16.17	16.17	16.48	16.69	17.02
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	10.54			10.13			16.17			16.73		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.06											
Intersection LOS	B											
Intersection V/C	0.268											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	633	633
d_b, Bicycle Delay [s]	8.01	8.01	14.01	14.01
l_b,int, Bicycle LOS Score for Intersection	2.071	2.050	1.804	1.828
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	113.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.142

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	2	990	783	3	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	98	42	0	0	0	270	0	3	204	173
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	467	173	129	919	100	2	1423	912	6	1191	288
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	96	127	47	35	250	27	1	387	248	2	324	78
Total Analysis Volume [veh/h]	386	508	188	140	999	109	2	1547	991	6	1295	313
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	28	49	0	15	36	0	0	66	0	0	66	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	0	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			Yes			Yes	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C	R	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	6.00	5.00	6.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	22	44	9	31	31	61	61	61	61
g / C, Green / Cycle	0.17	0.34	0.07	0.24	0.24	0.47	0.47	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.22	0.39	0.08	0.30	0.30	0.43	0.62	0.43	0.46
s, saturation flow rate [veh/h]	1781	1785	1781	1870	1806	3560	1589	1870	1750
c, Capacity [veh/h]	301	604	123	446	431	1671	746	877	821
d1, Uniform Delay [s]	54.00	43.00	60.50	49.50	49.50	32.38	34.50	32.12	33.88
k, delay calibration	0.37	0.50	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	143.84	86.33	80.89	134.99	136.93	10.30	157.11	15.81	26.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.28	1.15	1.14	1.26	1.27	0.93	1.33	0.92	0.98
d, Delay for Lane Group [s/veh]	197.84	129.33	141.39	184.49	186.43	42.68	191.61	47.94	60.64
Lane Group LOS	F	F	F	F	F	D	F	D	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	21.76	33.37	6.80	30.94	30.12	24.21	54.96	26.35	29.83
50th-Percentile Queue Length [m/ln]	165.81	254.26	51.79	235.77	229.51	184.47	418.83	200.82	227.32
95th-Percentile Queue Length [veh/ln]	32.92	46.98	11.52	45.38	44.35	32.28	81.06	34.77	38.79
95th-Percentile Queue Length [m/ln]	250.88	357.96	87.81	345.79	337.92	245.96	617.70	264.97	295.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	197.84	129.33	129.33	141.39	185.34	186.43	0.00	42.68	191.61	0.00	52.75	60.64
Movement LOS	F	F	F	F	F	F		D	F		D	E
d_A, Approach Delay [s/veh]	153.77			180.50			100.83			54.29		
Approach LOS	F			F			F			D		
d_I, Intersection Delay [s/veh]	113.47											
Intersection LOS	F											
Intersection V/C	1.142											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	54.47	54.47	54.47
l_p,int, Pedestrian LOS Score for Intersection	3.322	3.003	3.616	3.454
Crosswalk LOS	C	C	D	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	677	477	938	938
d_b, Bicycle Delay [s]	28.45	37.70	18.31	18.31
l_b,int, Bicycle LOS Score for Intersection	3.345	2.589	3.653	2.886
Bicycle LOS	C	B	D	C

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190722_2030_AM_Scenarios_Market_Lands.vistro
Report File: V:\...\2030 Full BO w Mitig - AM.pdf

Scenario 3 AM Peak - 2030 - mitig 1 - full BO
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.808	29.5	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	SB Left	0.681	25.9	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	EB Thru	0.504	13.8	B
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	1.250	1,020.6	F
13	Dupuy & Marion	Signalized	HCM 6th Edition	SB Left	0.599	18.6	B
14	Marion & Panet	Two-way stop	HCM 6th Edition	EB Left	0.710	32.4	D
15	Dawson & Marion	Signalized	HCM 6th Edition	WB Right	0.850	38.8	D
16	Dawson & Panet	Signalized	HCM 6th Edition	NWB Thru	0.399	17.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	NB Right	0.869	50.5	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.808

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	2	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	481	1396	1365	566	504	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	40	3	25	171	84	34
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	600	1629	1615	830	671	103
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	163	443	439	226	182	28
Total Analysis Volume [veh/h]	652	1771	1755	902	729	112
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	4	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	26	68	42	32	32	32
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	No	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	20	62	36	68	26	52
g / C, Green / Cycle	0.20	0.62	0.36	0.68	0.26	0.52
(v / s)_i Volume / Saturation Flow Rate	0.19	0.35	0.34	0.57	0.21	0.07
s, saturation flow rate [veh/h]	3459	5094	5094	1589	3459	1589
c, Capacity [veh/h]	692	3158	1834	1081	899	827
d1, Uniform Delay [s]	39.43	11.07	31.24	11.84	34.69	12.39
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.22	0.72	13.05	7.62	1.81	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.94	0.56	0.96	0.83	0.81	0.14
d, Delay for Lane Group [s/veh]	46.65	11.79	44.30	19.46	36.51	12.47
Lane Group LOS	D	B	D	B	D	B
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.10	6.34	14.71	12.94	8.37	1.27
50th-Percentile Queue Length [m/ln]	61.74	48.34	112.09	98.62	63.75	9.68
95th-Percentile Queue Length [veh/ln]	12.77	10.47	21.00	18.84	13.11	2.29
95th-Percentile Queue Length [m/ln]	97.31	79.82	160.02	143.58	99.89	17.42

Movement, Approach, & Intersection Results

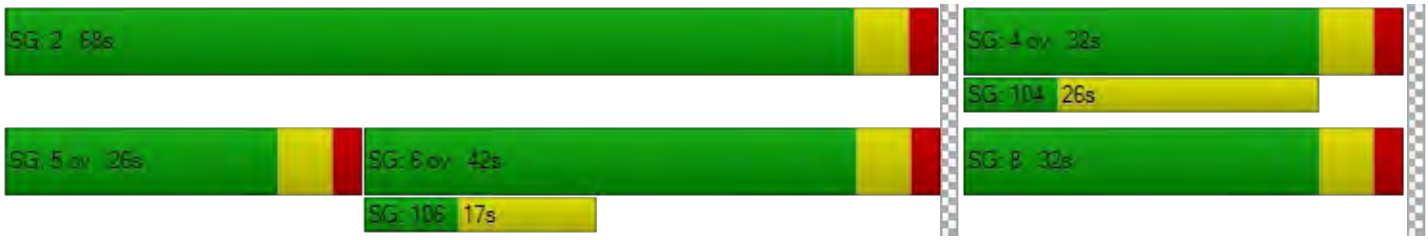
d_M, Delay for Movement [s/veh]	46.65	11.79	44.30	19.46	36.51	12.47
Movement LOS	D	B	D	B	D	B
d_A, Approach Delay [s/veh]	21.17		35.87		33.30	
Approach LOS	C		D		C	
d_I, Intersection Delay [s/veh]	29.49					
Intersection LOS	C					
Intersection V/C	0.808					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	0.00	39.61
l_p,int, Pedestrian LOS Score for Intersection	4.125	0.000	3.083
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	50.00	50.00	50.00
l_b,int, Bicycle LOS Score for Intersection	5.465	5.594	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	54	1886	34	77	1140	181	268	24	20	30	2	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	46	34	0	0	37	40	10	0	36	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	2231	40	90	1365	251	322	28	59	35	2	78
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	606	11	24	371	68	88	8	16	10	1	21
Total Analysis Volume [veh/h]	118	2425	43	98	1484	273	350	30	64	38	2	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	33	44	11	33	44	0	18	22	0	11	15	33
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	9	61	71	8	60	60	12	13	13	23	5	19
g / C, Green / Cycle	0.08	0.56	0.64	0.07	0.55	0.55	0.11	0.12	0.12	0.21	0.04	0.17
(v / s)_i Volume / Saturation Flow Rate	0.07	0.48	0.03	0.06	0.29	0.17	0.10	0.02	0.04	0.03	0.00	0.05
s, saturation flow rate [veh/h]	1781	5094	1589	1781	5094	1589	3459	1870	1589	1459	1870	1589
c, Capacity [veh/h]	149	2839	1022	130	2784	869	377	225	191	352	80	270
d1, Uniform Delay [s]	49.48	20.57	7.19	50.04	15.95	13.65	48.57	43.25	44.34	35.48	50.47	40.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.14	3.52	0.08	8.63	0.74	0.95	10.09	0.27	1.02	0.13	0.13	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.85	0.04	0.76	0.53	0.31	0.93	0.13	0.33	0.11	0.03	0.31
d, Delay for Lane Group [s/veh]	58.62	24.09	7.27	58.67	16.69	14.59	58.66	43.52	45.36	35.62	50.60	40.70
Lane Group LOS	E	C	A	E	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.44	15.93	0.34	2.86	7.21	3.54	5.26	0.75	1.65	0.84	0.06	2.07
50th-Percentile Queue Length [m/ln]	26.22	121.39	2.56	21.78	54.93	27.00	40.07	5.69	12.58	6.41	0.42	15.74
95th-Percentile Queue Length [veh/ln]	6.19	22.48	0.60	5.15	11.61	6.38	9.02	1.34	2.97	1.51	0.10	3.72
95th-Percentile Queue Length [m/ln]	47.19	171.27	4.61	39.21	88.48	48.59	68.72	10.24	22.65	11.54	0.76	28.33

Movement, Approach, & Intersection Results

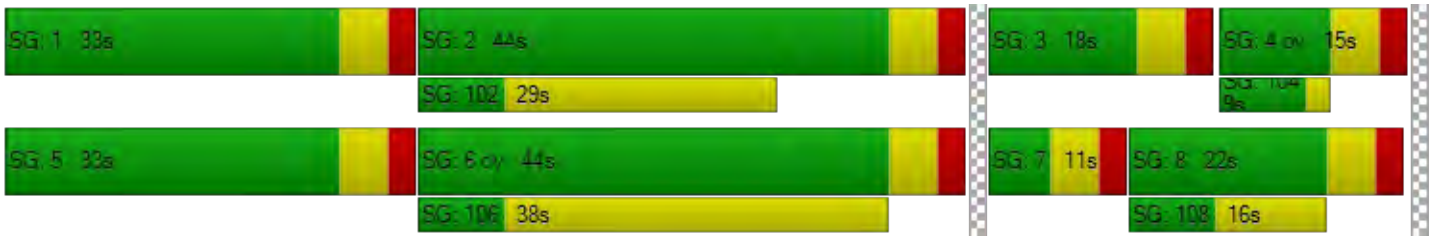
d_M, Delay for Movement [s/veh]	58.62	24.09	7.27	58.67	16.69	14.59	58.66	43.52	45.36	35.62	50.60	40.70
Movement LOS	E	C	A	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	25.38			18.60			55.72			39.31		
Approach LOS	C			B			E			D		
d_I, Intersection Delay [s/veh]	25.91											
Intersection LOS	C											
Intersection V/C	0.681											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
l_p,int, Pedestrian LOS Score for Intersection	4.098	4.064	2.790	2.406
Crosswalk LOS	D	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	691	691	291	164
d_b, Bicycle Delay [s]	23.56	23.56	40.16	46.37
l_b,int, Bicycle LOS Score for Intersection	2.982	2.580	1.926	1.766
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.504

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	4	16	151	33	5	8	21	123	8	69	76	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	80	4	38	32	34	82	3	0	8	7	71
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	99	180	76	38	43	106	146	9	88	96	172
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	27	49	21	10	12	29	40	2	24	26	47
Total Analysis Volume [veh/h]	5	108	196	83	41	47	115	159	10	96	104	187
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	614	554	569	527	614
Degree of Utilization, x	0.50	0.31	0.50	0.38	0.30

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.84	1.30	2.77	1.76	1.28
95th-Percentile Queue Length [m]	21.61	9.93	21.12	13.40	9.79
Approach Delay [s/veh]	14.68	12.36	15.45	12.42	
Approach LOS	B	B	C	B	
Intersection Delay [s/veh]	13.77				
Intersection LOS	B				

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Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	1,020.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.250

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	6	7	31	956	1060	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	413	292	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	9	36	1527	1527	27
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	10	415	415	7
Total Analysis Volume [veh/h]	8	10	39	1660	1660	29
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.25	0.03	0.10	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	1020.56	469.92	15.59	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	2.86	2.86	0.34	0.17	0.00	0.00
95th-Percentile Queue Length [m/ln]	21.77	21.77	2.60	1.30	0.00	0.00
d_A, Approach Delay [s/veh]	714.65		0.36		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	3.96					
Intersection LOS	F					

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Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	150.00	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	11	0	11	15	915	0	0	1088	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	278	1	73	0	2	0	0	4	404	94	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	278	1	73	13	2	13	17	1070	404	94	1277	19
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	0	20	4	1	4	5	291	110	26	347	5
Total Analysis Volume [veh/h]	302	1	79	14	2	14	18	1163	439	102	1388	21
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	18	55	0	0	37	0	11	44	0	11	44	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	19	0	0	22	0	0	16	0	0	7	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	Yes		No	Yes	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	11	21	4	77	66	66	77	69	69
g / C, Green / Cycle	0.10	0.19	0.03	0.70	0.60	0.60	0.70	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.09	0.05	0.12	0.05	0.33	0.28	0.16	0.38	0.38
s, saturation flow rate [veh/h]	3459	1592	244	395	3532	1589	631	1840	1830
c, Capacity [veh/h]	361	307	56	291	2120	954	438	1148	1142
d1, Uniform Delay [s]	48.33	37.74	54.51	8.70	13.11	12.15	8.34	12.60	12.61
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.13	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.14	0.45	7.62	0.41	1.03	1.60	0.31	2.46	2.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.26	0.53	0.06	0.55	0.46	0.23	0.61	0.62
d, Delay for Lane Group [s/veh]	53.48	38.18	62.14	9.10	14.14	13.75	8.66	15.07	15.10
Lane Group LOS	D	D	E	A	B	B	A	B	B
Critical Lane Group	Yes	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.30	1.87	0.96	0.14	8.09	5.87	0.69	10.23	10.21
50th-Percentile Queue Length [m/ln]	32.77	14.25	7.32	1.08	61.67	44.76	5.23	77.96	77.79
95th-Percentile Queue Length [veh/ln]	7.70	3.37	1.73	0.26	12.76	9.85	1.24	15.48	15.45
95th-Percentile Queue Length [m/ln]	58.68	25.65	13.17	1.95	97.22	75.04	9.41	117.93	117.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.48	38.18	38.18	62.14	62.14	62.14	9.10	14.14	13.75	8.66	15.08	15.10
Movement LOS	D	D	D	E	E	E	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	50.27			62.14			13.98			14.65		
Approach LOS	D			E			B			B		
d_I, Intersection Delay [s/veh]	18.58											
Intersection LOS	B											
Intersection V/C	0.599											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.37	46.37	46.37	46.37
l_p,int, Pedestrian LOS Score for Intersection	2.701	1.799	3.544	3.410
Crosswalk LOS	B	A	D	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	891	564	691	691
d_b, Bicycle Delay [s]	16.91	28.37	23.56	23.56
l_b,int, Bicycle LOS Score for Intersection	2.190	1.609	2.896	2.806
Bicycle LOS	B	A	C	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	233	683	1074	1	0	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	136	214	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	273	932	1465	1	0	174
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	251	394	0	0	47
Total Analysis Volume [veh/h]	294	1002	1575	1	0	187
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.71	0.01	0.02	0.00	0.00	0.56
d_M, Delay for Movement [s/veh]	32.35	0.00	0.00	0.00	0.00	28.66
Movement LOS	D	A	A	A		D
95th-Percentile Queue Length [veh/ln]	5.41	2.70	0.00	0.00	0.00	3.24
95th-Percentile Queue Length [m/ln]	41.19	20.60	0.00	0.00	0.00	24.72
d_A, Approach Delay [s/veh]	7.34		0.00		28.66	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.86					
Intersection LOS	D					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	38.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.850

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	7	521	155	1	854	99	220	227	5	7	88	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	118	18	0	212	0	2	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	725	199	1	1207	115	258	264	6	8	103	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	197	54	0	328	31	70	72	2	2	28	0
Total Analysis Volume [veh/h]	9	788	216	1	1312	125	280	287	7	9	112	1
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	0	0	35	0	0	35	0	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	29	29	29	29
g / C, Green / Cycle	0.41	0.41	0.41	0.41	0.41	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.35	0.35	0.41	0.41	0.44	0.01	0.06
s, saturation flow rate [veh/h]	1274	1594	1869	1648	1305	1085	1867
c, Capacity [veh/h]	580	660	826	683	617	103	773
d1, Uniform Delay [s]	17.27	18.56	20.26	20.36	23.23	12.21	12.78
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.81	13.11	17.31	32.23	22.61	1.67	0.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.85	0.92	0.99	0.93	0.09	0.15
d, Delay for Lane Group [s/veh]	27.09	31.67	37.57	52.60	45.84	13.89	13.18
Lane Group LOS	C	C	D	D	D	B	B
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.61	9.51	14.48	15.49	12.47	0.12	1.07
50th-Percentile Queue Length [m/ln]	50.39	72.47	110.31	118.03	95.02	0.93	8.14
95th-Percentile Queue Length [veh/ln]	10.83	14.57	20.72	21.94	18.26	0.22	1.92
95th-Percentile Queue Length [m/ln]	82.53	111.01	157.86	167.21	139.15	1.68	14.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.09	29.10	31.67	37.57	43.88	52.60	45.84	45.84	45.84	13.89	13.18	13.18
Movement LOS	C	C	C	D	D	D	D	D	D	B	B	B
d_A, Approach Delay [s/veh]	29.63			44.63			45.84			13.23		
Approach LOS	C			D			D			B		
d_I, Intersection Delay [s/veh]	38.81											
Intersection LOS	D											
Intersection V/C	0.850											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	26.58	26.58	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.789	3.226	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	829	829	829	829
d_b, Bicycle Delay [s]	12.01	12.01	12.01	12.01
l_b,int, Bicycle LOS Score for Intersection	2.395	2.746	2.507	1.761
Bicycle LOS	B	B	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.399

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	41	192	0	31	94	19	1	295	37	5	64	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	1	0	0	2	0	0	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	225	0	36	112	22	1	344	43	6	75	61
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	61	0	10	30	6	0	93	12	2	20	17
Total Analysis Volume [veh/h]	53	245	0	39	122	24	1	374	47	7	82	66
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	40	0	0	40	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	24	24	24
g / C, Green / Cycle	0.49	0.49	0.49	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.17	0.10	0.02	0.23	0.05	0.05
s, saturation flow rate [veh/h]	1763	1680	1589	1834	1822	1465
c, Capacity [veh/h]	917	880	772	680	681	502
d1, Uniform Delay [s]	11.01	10.13	9.40	19.63	15.82	15.90
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.94	0.46	0.07	4.22	0.37	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.18	0.03	0.62	0.12	0.14
d, Delay for Lane Group [s/veh]	11.95	10.59	9.47	23.85	16.18	16.50
Lane Group LOS	B	B	A	C	B	B
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.65	1.31	0.18	6.04	0.90	0.81
50th-Percentile Queue Length [m/ln]	20.16	9.96	1.38	46.02	6.85	6.16
95th-Percentile Queue Length [veh/ln]	4.76	2.35	0.33	10.07	1.62	1.46
95th-Percentile Queue Length [m/ln]	36.29	17.93	2.49	76.73	12.33	11.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.95	11.95	0.00	10.59	10.59	9.47	23.85	23.85	23.85	16.18	16.21	16.50
Movement LOS	B	B		B	B	A	C	C	C	B	B	B
d_A, Approach Delay [s/veh]	11.95			10.44			23.85			16.33		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	17.07											
Intersection LOS	B											
Intersection V/C	0.399											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	971	971	686	686
d_b, Bicycle Delay [s]	9.26	9.26	15.11	15.11
l_b,int, Bicycle LOS Score for Intersection	2.051	1.865	2.256	1.687
Bicycle LOS	B	A	B	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	50.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.869

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	1	0	0	1	0	0	0
Pocket Length [m]	150.00	30.48	30.48	100.00	30.48	100.00	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	801	760	62	66	249	82	2	730	269	3	850	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	170	88	0	0	0	154	0	1	228	63
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	933	885	242	165	290	96	2	1004	313	4	1218	157
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	254	240	66	45	79	26	1	273	85	1	331	43
Total Analysis Volume [veh/h]	1014	962	263	179	315	104	2	1091	340	4	1324	171
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	5	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	5	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	30	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	2.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	37	39	0	16	18	16	0	45	45	0	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	4.0	0.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	C	R	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	6.00	5.00	5.00	6.00	5.00	5.00	5.00	6.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	3.00	4.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	31	34	34	10	13	13	40	76	40	40
g / C, Green / Cycle	0.31	0.34	0.34	0.10	0.13	0.13	0.40	0.76	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.29	0.33	0.35	0.10	0.09	0.07	0.31	0.12	0.40	0.42
s, saturation flow rate [veh/h]	3459	1870	1738	1781	3560	1589	3560	2813	1870	1797
c, Capacity [veh/h]	1068	636	591	178	467	208	1424	2135	748	719
d1, Uniform Delay [s]	33.79	32.39	33.00	45.00	41.41	40.39	25.95	3.31	29.99	30.00
k, delay calibration	0.11	0.41	0.46	0.11	0.11	0.11	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.48	24.54	45.35	32.59	1.71	1.84	3.99	0.03	32.75	44.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.96	1.04	1.01	0.67	0.50	0.77	0.16	1.00	1.04
d, Delay for Lane Group [s/veh]	39.27	56.92	78.35	77.59	43.12	42.24	29.94	3.34	62.74	74.30
Lane Group LOS	D	E	F	F	D	D	C	A	E	F
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	12.28	18.10	20.98	5.92	3.73	2.43	11.37	0.68	23.56	24.97
50th-Percentile Queue Length [m/ln]	93.58	137.95	159.89	45.14	28.39	18.55	86.63	5.22	179.50	190.25
95th-Percentile Queue Length [veh/ln]	18.03	25.08	29.19	9.93	6.71	4.38	16.90	1.23	31.52	34.11
95th-Percentile Queue Length [m/ln]	137.37	191.13	222.44	75.70	51.09	33.39	128.77	9.39	240.15	259.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.27	64.71	78.35	77.59	43.12	42.24	0.00	29.94	3.34	0.00	67.77	74.30
Movement LOS	D	E	E	F	D	D		C	A		E	E
d_A, Approach Delay [s/veh]	54.79			53.29			23.62			68.52		
Approach LOS	D			D			C			E		
d_I, Intersection Delay [s/veh]	50.45											
Intersection LOS	D											
Intersection V/C	0.869											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	0.00	39.61
l_p,int, Pedestrian LOS Score for Intersection	3.267	3.020	0.000	3.296
Crosswalk LOS	C	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	680	260	800	800
d_b, Bicycle Delay [s]	21.78	37.85	18.00	18.00
l_b,int, Bicycle LOS Score for Intersection	3.407	2.053	2.740	2.793
Bicycle LOS	C	B	B	C

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: V:\...\20190722_2030_PM_Scenarios_Market_Lands.vistro
Report File: V:\...\2030 Full BO w Mitig - PM.pdf

Scenario 3 PM Peak - 2030 - mitig 1 - full BO
7/25/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Lagimodiere & Marion	Signalized	HCM 6th Edition	NB Left	0.801	34.4	C
6	Lagimodiere & Maginot	Signalized	HCM 6th Edition	NB Left	0.755	29.6	C
9	Maginot & Speers	All-way stop	HCM 6th Edition	SB Left	0.762	22.0	C
12	Marion & Nicolas	Two-way stop	HCM 6th Edition	SB Left	3.053	1,794.0	F
13	Dupuy & Marion	Signalized	HCM 6th Edition	SB Left	0.793	28.2	C
14	Marion & Panet	Two-way stop	HCM 6th Edition	SWB Right	0.533	19.6	C
15	Dawson & Marion	Signalized	HCM 6th Edition	SEB Left	0.832	26.5	C
16	Dawson & Panet	Signalized	HCM 6th Edition	SEB Right	0.268	13.1	B
19	Archibald & Marion	Signalized	HCM 6th Edition	SB Thru	0.852	42.9	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

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Version 7.00-03

Intersection Level Of Service Report

Intersection 1: Lagimodiere & Marion

Control Type:	Signalized	Delay (sec / veh):	34.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.66	3.66	3.66	3.66
No. of Lanes in Pocket	2	0	0	1	0	1
Pocket Length [m]	120.00	30.48	30.48	220.00	30.48	100.00
Speed [km/h]	80.00		80.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name	Lagimodiere Blvd		Lagimodiere Blvd		Marion St	
Base Volume Input [veh/h]	103	1222	1817	406	665	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	40	19	2	87	175	77
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	1443	2119	560	950	404
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	392	576	152	258	110
Total Analysis Volume [veh/h]	174	1568	2303	609	1033	439
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Overlap	Permissive	Overlap
Signal group	5	2	6	4	4	8
Auxiliary Signal Groups				4,6		4,5,8
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	5	5	5	5	5	5
Maximum Green [s]	30	30	30	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	2.0
Split [s]	15	93	78	57	57	57
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Walk [s]	0	0	7	7	7	0
Pedestrian Clearance [s]	0	10	10	19	19	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No	No
Maximum Recall	No	Yes	Yes	No	No	No
Pedestrian Recall	No	No	No	No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	9	89	74	129	49	64
g / C, Green / Cycle	0.06	0.59	0.49	0.86	0.33	0.43
(v / s)_i Volume / Saturation Flow Rate	0.05	0.31	0.45	0.38	0.30	0.28
s, saturation flow rate [veh/h]	3459	5094	5094	1589	3459	1589
c, Capacity [veh/h]	208	3027	2517	1367	1127	677
d1, Uniform Delay [s]	69.78	17.85	35.03	2.38	48.60	34.16
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.31
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.69	0.64	6.56	1.05	3.47	2.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.52	0.91	0.45	0.92	0.65
d, Delay for Lane Group [s/veh]	78.47	18.48	41.59	3.44	52.08	37.11
Lane Group LOS	E	B	D	A	D	D
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.49	10.08	25.74	2.43	19.09	13.30
50th-Percentile Queue Length [m/ln]	26.61	76.79	196.10	18.50	145.44	101.34
95th-Percentile Queue Length [veh/ln]	6.29	15.28	34.06	4.37	26.25	19.28
95th-Percentile Queue Length [m/ln]	47.90	116.46	259.50	33.30	200.04	146.92

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	78.47	18.48	41.59	3.44	52.08	37.11
Movement LOS	E	B	D	A	D	D
d_A, Approach Delay [s/veh]	24.48		33.61		47.61	
Approach LOS	C		C		D	
d_I, Intersection Delay [s/veh]	34.38					
Intersection LOS	C					
Intersection V/C	0.801					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	0.00	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.207	0.000	3.057
Crosswalk LOS	D	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	75.00	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	5.091	5.734	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report

Intersection 6: Lagimodiere & Maginot

Control Type:	Signalized	Delay (sec / veh):	29.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	1
Pocket Length [m]	90.00	30.48	60.00	80.00	30.48	65.00	65.00	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	80.00			80.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lagimodiere Blvd			Lagimodiere Blvd			Maginot St			CN Symington Yard Access		
Base Volume Input [veh/h]	49	1081	10	14	2260	215	186	3	54	22	1	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	37	30	0	0	78	36	31	0	91	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	1289	12	16	2711	286	248	3	154	26	1	49
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	350	3	4	737	78	67	1	42	7	0	13
Total Analysis Volume [veh/h]	102	1401	13	17	2947	311	270	3	167	28	1	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap
Signal group	1	6	7	5	2	0	3	8	0	7	4	5
Auxiliary Signal Groups			6,7									4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	0	5	5	0	5	5	5
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	30
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Split [s]	52	105	11	11	64	0	19	23	0	11	15	11
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	22	0	0	9	0	0	2	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	4.0
Minimum Recall	No	No	No	No	No		No	No		No	No	No
Maximum Recall	No	Yes	No	No	Yes		No	No		No	No	No
Pedestrian Recall	No	No	No	No	No		No	No		No	No	No
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	0.00
g_i, Effective Green Time [s]	11	102	111	3	94	94	13	18	18	27	8	17
g / C, Green / Cycle	0.07	0.68	0.74	0.02	0.63	0.63	0.09	0.12	0.12	0.18	0.05	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.01	0.01	0.58	0.20	0.08	0.00	0.11	0.02	0.00	0.03
s, saturation flow rate [veh/h]	1781	5094	1589	1781	5094	1589	3459	1870	1589	1371	1870	1589
c, Capacity [veh/h]	127	3451	1177	40	3201	999	300	219	186	193	100	184
d1, Uniform Delay [s]	68.61	10.76	5.09	72.38	24.56	12.87	67.86	58.56	65.32	52.04	67.23	60.66
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.05	0.36	0.02	7.11	5.63	0.81	9.68	0.02	13.99	0.34	0.04	0.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.41	0.01	0.43	0.92	0.31	0.90	0.01	0.90	0.15	0.01	0.29
d, Delay for Lane Group [s/veh]	79.66	11.11	5.11	79.49	30.19	13.68	77.54	58.58	79.31	52.39	67.27	61.51
Lane Group LOS	E	B	A	E	C	B	E	E	E	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.17	6.33	0.10	0.71	28.88	4.74	5.55	0.10	7.04	0.91	0.04	1.90
50th-Percentile Queue Length [m/ln]	31.78	48.26	0.74	5.43	220.04	36.11	42.26	0.79	53.65	6.91	0.29	14.50
95th-Percentile Queue Length [veh/ln]	7.51	10.46	0.18	1.28	37.69	8.31	9.41	0.19	11.39	1.63	0.07	3.43
95th-Percentile Queue Length [m/ln]	57.20	79.70	1.34	9.78	287.20	63.32	71.69	1.42	86.81	12.44	0.52	26.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	79.66	11.11	5.11	79.49	30.19	13.68	77.54	58.58	79.31	52.39	67.27	61.51
Movement LOS	E	B	A	E	C	B	E	E	E	D	E	E
d_A, Approach Delay [s/veh]	15.67			28.88			78.08			58.46		
Approach LOS	B			C			E			E		
d_I, Intersection Delay [s/veh]	29.64											
Intersection LOS	C											
Intersection V/C	0.755											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	64.40	64.40	64.40	64.40
l_p,int, Pedestrian LOS Score for Intersection	4.269	4.147	2.807	2.362
Crosswalk LOS	E	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1320	773	227	120
d_b, Bicycle Delay [s]	8.67	28.21	58.96	66.27
l_b,int, Bicycle LOS Score for Intersection	2.393	3.361	1.923	1.695
Bicycle LOS	B	C	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Maginot & Speers

Control Type:	All-way stop	Delay (sec / veh):	22.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

Intersection Setup

Name	Speers Rd						Maginot St			Maginot St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Speers Rd						Maginot St			Maginot St		
Base Volume Input [veh/h]	6	10	91	51	16	15	4	115	15	81	151	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	61	7	110	88	88	62	6	0	17	17	39
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	73	113	169	107	105	67	140	17	111	193	61
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	20	31	46	29	29	18	38	5	30	52	17
Total Analysis Volume [veh/h]	8	79	123	184	116	114	73	152	18	121	210	66
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	517	543	493	480	546
Degree of Utilization, x	0.41	0.76	0.49	0.69	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.96	6.78	2.69	5.21	0.41
95th-Percentile Queue Length [m]	14.90	51.66	20.48	39.67	3.12
Approach Delay [s/veh]	14.66	27.82	17.21	22.73	
Approach LOS	B	D	C	C	
Intersection Delay [s/veh]	22.00				
Intersection LOS	C				

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Version 7.00-03

Intersection Level Of Service Report
Intersection 12: Marion & Nicolas

Control Type:	Two-way stop	Delay (sec / veh):	1,794.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.053

Intersection Setup

Name	Nicolas Ave		Marion St		Marion St	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	50.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Nicolas Ave		Marion St		Marion St	
Base Volume Input [veh/h]	14	21	7	1219	966	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	67.00	1.00	1.00	3.00	4.00	18.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	410	380	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	24	8	1830	1505	8
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	7	2	497	409	2
Total Analysis Volume [veh/h]	20	26	9	1989	1636	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	3.05	0.08	0.02	0.02	0.02	0.00
d_M, Delay for Movement [s/veh]	1794.03	1255.82	14.36	0.00	0.00	0.00
Movement LOS	F	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	6.55	6.55	0.07	0.04	0.00	0.00
95th-Percentile Queue Length [m/ln]	49.91	49.91	0.53	0.27	0.00	0.00
d_A, Approach Delay [s/veh]	1489.83		0.06		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	18.61					
Intersection LOS	F					

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Version 7.00-03

Intersection Level Of Service Report
Intersection 13: Dupuy & Marion

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.793

Intersection Setup

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	1	1	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	40.00	30.48	30.48	80.00	30.48	30.48
Speed [km/h]	50.00			50.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Louis Riel Way			Dupuy Ave			Marion St			Marion St		
Base Volume Input [veh/h]	0	0	0	12	0	9	5	1275	0	0	1011	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	55.00	2.00	82.00	27.00	3.00	2.00	2.00	4.00	50.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	358	2	143	0	2	0	1	19	389	82	11	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	27	0	9	0	0	0	0	13	16	29	-29	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	385	2	152	14	2	10	7	1517	405	111	1160	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	105	1	41	4	1	3	2	412	110	30	315	3
Total Analysis Volume [veh/h]	418	2	165	15	2	11	8	1649	440	121	1261	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	3	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Split [s]	24	92	0	0	68	0	11	27	0	11	27	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	19	0	0	22	0	0	16	0	0	7	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	No	No			No		No	Yes		No	Yes	
Pedestrian Recall	No	No			No		No	No		No	No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	18	28	4	90	79	79	90	82	82
g / C, Green / Cycle	0.14	0.22	0.03	0.69	0.60	0.60	0.69	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.13	0.12	0.11	0.02	0.52	0.31	0.30	0.38	0.38
s, saturation flow rate [veh/h]	3113	1433	252	370	3179	1431	406	1656	1651
c, Capacity [veh/h]	431	314	51	255	1920	864	241	1048	1045
d1, Uniform Delay [s]	55.73	44.89	64.10	10.20	21.16	14.71	26.81	14.24	14.24
k, delay calibration	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	14.19	1.40	8.81	0.23	5.26	2.14	7.28	2.62	2.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.97	0.53	0.55	0.03	0.86	0.51	0.50	0.61	0.61
d, Delay for Lane Group [s/veh]	69.92	46.29	72.91	10.43	26.42	16.85	34.10	16.86	16.87
Lane Group LOS	E	D	E	B	C	B	C	B	B
Critical Lane Group	Yes	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.65	4.90	1.07	0.08	20.37	7.55	1.54	11.14	11.12
50th-Percentile Queue Length [m/ln]	58.31	37.35	8.14	0.62	155.23	57.52	11.71	84.92	84.76
95th-Percentile Queue Length [veh/ln]	12.19	8.53	1.92	0.15	27.77	12.05	2.77	16.62	16.59
95th-Percentile Queue Length [m/ln]	92.88	65.01	14.66	1.11	211.64	91.86	21.08	126.63	126.43

Movement, Approach, & Intersection Results

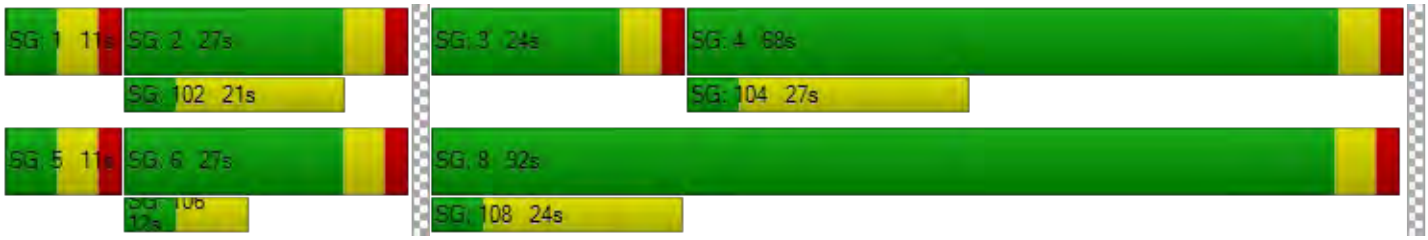
d_M, Delay for Movement [s/veh]	69.92	46.29	46.29	72.91	72.91	72.91	10.43	26.42	16.85	34.10	16.87	16.87
Movement LOS	E	D	D	E	E	E	B	C	B	C	B	B
d_A, Approach Delay [s/veh]	63.17			72.91			24.35			18.36		
Approach LOS	E			E			C			B		
d_I, Intersection Delay [s/veh]	28.19											
Intersection LOS	C											
Intersection V/C	0.793											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	56.31	56.31	56.31	56.31
l_p,int, Pedestrian LOS Score for Intersection	2.799	1.781	3.703	3.597
Crosswalk LOS	C	A	D	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1323	954	323	323
d_b, Bicycle Delay [s]	7.45	17.78	45.70	45.70
l_b,int, Bicycle LOS Score for Intersection	2.525	1.606	3.290	2.709
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 14: Marion & Panet

Control Type:	Two-way stop	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Marion St		Marion St		Panet Rd	
Approach	Eastbound		Westbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00		60.00		60.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Marion St		Marion St		Panet Rd	
Base Volume Input [veh/h]	239	1046	687	0	0	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	288	130	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	283	1507	930	0	0	256
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	405	250	0	0	69
Total Analysis Volume [veh/h]	304	1620	1000	0	0	275
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.44	0.02	0.01	0.00	0.00	0.53
d_M, Delay for Movement [s/veh]	14.31	0.00	0.00	0.00	0.00	19.64
Movement LOS	B	A	A	A		C
95th-Percentile Queue Length [veh/ln]	2.27	1.13	0.00	0.00	0.00	3.10
95th-Percentile Queue Length [m/ln]	17.28	8.64	0.00	0.00	0.00	23.63
d_A, Approach Delay [s/veh]	2.26		0.00		19.64	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.05					
Intersection LOS	C					

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Intersection Level Of Service Report
Intersection 15: Dawson & Marion

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Approach	Eastbound			Westbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Marion St			Marion St			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	3	825	218	3	549	28	138	86	26	57	175	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	254	34	0	127	0	3	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	1215	288	3	767	33	164	100	30	66	204	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	330	78	1	208	9	45	27	8	18	55	0
Total Analysis Volume [veh/h]	4	1321	313	3	834	36	178	109	33	72	222	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	50	0	0	50	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	L	C
C, Cycle Length [s]	80	80	80	80	80	80	80
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	44	44	44	44	24	24	24
g / C, Green / Cycle	0.55	0.55	0.55	0.55	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.47	0.48	0.25	0.25	0.35	0.06	0.12
s, saturation flow rate [veh/h]	1866	1587	1859	1676	914	1246	1870
c, Capacity [veh/h]	1072	873	1067	922	344	90	561
d1, Uniform Delay [s]	15.19	15.64	10.74	10.76	32.51	21.86	22.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.81	12.05	1.27	1.58	33.60	51.05	2.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.88	0.43	0.45	0.93	0.80	0.40
d, Delay for Lane Group [s/veh]	22.00	27.69	12.00	12.34	66.12	72.91	24.33
Lane Group LOS	C	C	B	B	E	E	C
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.13	12.95	4.50	4.13	9.29	2.27	3.43
50th-Percentile Queue Length [m/ln]	100.05	98.69	34.32	31.51	70.81	17.28	26.17
95th-Percentile Queue Length [veh/ln]	19.07	18.85	7.99	7.44	14.29	4.08	6.18
95th-Percentile Queue Length [m/ln]	145.33	143.67	60.85	56.71	108.90	31.10	47.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.00	23.95	27.69	12.00	12.15	12.34	66.12	66.12	66.12	72.91	24.33	24.33
Movement LOS	C	C	C	B	B	B	E	E	E	E	C	C
d_A, Approach Delay [s/veh]	24.66			12.16			66.12			36.22		
Approach LOS	C			B			E			D		
d_I, Intersection Delay [s/veh]	26.50											
Intersection LOS	C											
Intersection V/C	0.832											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	31.51	31.51	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.672	3.350	0.000	0.000
Crosswalk LOS	D	C	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1100	1100	600	600
d_b, Bicycle Delay [s]	8.10	8.10	19.60	19.60
l_b,int, Bicycle LOS Score for Intersection	2.911	2.280	2.088	2.045
Bicycle LOS	C	B	B	B

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Intersection Level Of Service Report
Intersection 16: Dawson & Panet

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.268

Intersection Setup

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	15.00	30.48	30.48	30.48	30.48	30.48	10.00
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	Panet Rd			Panet Rd			Dawson Rd N			Dawson Rd N		
Base Volume Input [veh/h]	23	216	0	43	173	16	0	85	32	22	190	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.0000	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	0	2	0	0	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	255	0	50	204	19	0	99	37	26	221	52
Peak Hour Factor	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	69	0	14	55	5	0	27	10	7	60	14
Total Analysis Volume [veh/h]	33	277	0	54	222	21	0	108	40	28	240	57
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	35	0	0	35	0	0	25	0	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C
C, Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	19	19	19
g / C, Green / Cycle	0.48	0.48	0.48	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.01	0.08	0.10	0.10
s, saturation flow rate [veh/h]	1809	1709	1589	1785	1791	1596
c, Capacity [veh/h]	941	898	768	625	637	505
d1, Uniform Delay [s]	9.60	9.39	8.12	15.27	15.43	15.49
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.94	0.89	0.07	0.89	1.05	1.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.31	0.03	0.24	0.27	0.30
d, Delay for Lane Group [s/veh]	10.54	10.28	8.18	16.17	16.48	17.02
Lane Group LOS	B	B	A	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.25	1.97	0.13	1.47	1.74	1.59
50th-Percentile Queue Length [m/ln]	17.15	15.00	0.98	11.23	13.26	12.13
95th-Percentile Queue Length [veh/ln]	4.05	3.54	0.23	2.65	3.13	2.86
95th-Percentile Queue Length [m/ln]	30.87	27.00	1.77	20.22	23.87	21.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.54	10.54	0.00	10.28	10.28	8.18	16.17	16.17	16.17	16.48	16.69	17.02
Movement LOS	B	B		B	B	A	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	10.54			10.13			16.17			16.73		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.06											
Intersection LOS	B											
Intersection V/C	0.268											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	967	967	633	633
d_b, Bicycle Delay [s]	8.01	8.01	14.01	14.01
l_b,int, Bicycle LOS Score for Intersection	2.071	2.050	1.804	1.828
Bicycle LOS	B	B	A	A

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Version 7.00-03

Intersection Level Of Service Report
Intersection 19: Archibald & Marion

Control Type:	Signalized	Delay (sec / veh):	42.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.852

Intersection Setup

Name	Archibald St			Archibald St			Marion St			Marion St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Pocket	2	0	0	1	0	1	0	0	1	0	0	0
Pocket Length [m]	150.00	30.48	30.48	100.00	30.48	100.00	30.48	30.48	100.00	30.48	30.48	30.48
Speed [km/h]	60.00			60.00			60.00			60.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Archibald St			Archibald St			Marion St			Marion St		
Base Volume Input [veh/h]	305	401	64	75	789	86	2	990	783	3	847	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1650	1.1650	1.1650	1.1650	1.1650	1.1650	1.0000	1.1650	1.1650	1.0000	1.1650	1.1650
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	98	42	0	0	0	270	0	3	204	173
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	467	173	129	919	100	2	1423	912	6	1191	288
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	96	127	47	35	250	27	1	387	248	2	324	78
Total Analysis Volume [veh/h]	386	508	188	140	999	109	2	1547	991	6	1295	313
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	1	6	0	5	2	0	0	8	8	0	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	5	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	30	0	30	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	4.0	0.0	4.0	0.0
All red [s]	2.0	1.0	0.0	2.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	19	37	0	17	35	0	0	56	56	0	56	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	13	0	0	6	0	0	15	15	0	15	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	3.0	0.0	4.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			Yes	Yes		Yes	
Pedestrian Recall	No	No		No	No			No	No		No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	C	R	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	5.00	5.00	6.00	5.00	5.00	5.00	6.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	3.00	3.00	4.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	13	33	33	10	30	30	51	69	51	51
g / C, Green / Cycle	0.12	0.30	0.30	0.09	0.27	0.27	0.46	0.63	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.11	0.19	0.20	0.08	0.28	0.07	0.43	0.35	0.43	0.46
s, saturation flow rate [veh/h]	3459	1870	1700	1781	3560	1589	3560	2813	1870	1750
c, Capacity [veh/h]	409	552	502	170	971	433	1651	1765	867	811
d1, Uniform Delay [s]	48.14	33.91	33.92	48.84	40.00	31.23	27.98	11.80	27.76	29.27
k, delay calibration	0.11	0.19	0.19	0.11	0.11	0.11	0.50	0.16	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.17	2.38	2.63	9.53	21.56	0.30	11.55	0.42	17.32	29.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.94	0.66	0.66	0.82	1.03	0.25	0.94	0.56	0.93	0.99
d, Delay for Lane Group [s/veh]	59.31	36.29	36.55	58.37	61.56	31.53	39.53	12.22	45.08	58.78
Lane Group LOS	E	D	D	E	F	C	D	B	D	E
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.79	8.64	7.90	4.16	15.60	2.26	20.67	6.36	22.75	26.25
50th-Percentile Queue Length [m/ln]	44.11	65.87	60.23	31.73	118.85	17.23	157.49	48.44	173.38	200.00
95th-Percentile Queue Length [veh/ln]	9.74	13.47	12.51	7.50	22.46	4.07	28.12	10.49	30.58	34.65
95th-Percentile Queue Length [m/ln]	74.18	102.61	95.36	57.11	171.13	31.01	214.30	79.95	232.99	264.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.31	36.36	36.55	58.37	61.56	31.53	0.00	39.53	12.22	0.00	50.27	58.78
Movement LOS	E	D	D	E	F	C		D	B		D	E
d_A, Approach Delay [s/veh]	44.58			58.58			28.86			51.93		
Approach LOS	D			E			C			D		
d_I, Intersection Delay [s/veh]	42.94											
Intersection LOS	D											
Intersection V/C	0.852											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	44.55
l_p,int, Pedestrian LOS Score for Intersection	3.310	3.097	0.000	3.445
Crosswalk LOS	C	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	582	545	927	927
d_b, Bicycle Delay [s]	27.65	29.09	15.82	15.82
l_b,int, Bicycle LOS Score for Intersection	2.452	2.589	3.653	2.886
Bicycle LOS	B	B	D	C

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX E

SIDRA Traffic Analysis Reports

MOVEMENT SUMMARY

Site: 101 [Luis Riel and Marion]

Luis Riel and Marion
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Luis Riel												
1	L2	100	0.0	0.102	10.2	LOS B	0.4	3.1	0.60	0.80	0.60	44.4
2	T1	5	0.0	0.102	5.1	LOS A	0.4	3.1	0.60	0.72	0.60	43.4
3	R2	64	5.0	0.102	5.5	LOS A	0.4	3.1	0.60	0.72	0.60	44.4
Approach		169	1.9	0.102	8.2	LOS A	0.4	3.1	0.60	0.77	0.60	44.4
East: Marion												
4	L2	75	5.0	0.506	8.2	LOS A	3.9	28.7	0.44	0.44	0.44	46.9
5	T1	1249	5.0	0.506	3.6	LOS A	4.0	29.4	0.43	0.42	0.43	47.4
6	R2	18	10.0	0.506	3.9	LOS A	4.0	29.4	0.41	0.39	0.41	43.4
Approach		1342	5.1	0.506	3.9	LOS A	4.0	29.4	0.43	0.42	0.43	47.3
North: Access												
7	L2	13	10.0	0.051	11.6	LOS B	0.2	1.5	0.67	0.79	0.67	43.2
8	T1	5	0.0	0.051	6.6	LOS A	0.2	1.5	0.67	0.79	0.67	41.7
9	R2	13	0.0	0.051	6.6	LOS A	0.2	1.5	0.67	0.79	0.67	41.4
Approach		31	4.1	0.051	8.7	LOS A	0.2	1.5	0.67	0.79	0.67	42.2
West: Marion												
10	L2	17	1.0	0.434	7.9	LOS A	3.0	22.0	0.35	0.39	0.35	30.5
11	T1	1051	5.0	0.434	3.4	LOS A	3.1	22.2	0.33	0.39	0.33	47.9
12	R2	122	1.0	0.434	3.6	LOS A	3.1	22.2	0.32	0.38	0.32	45.8
Approach		1189	4.5	0.434	3.5	LOS A	3.1	22.2	0.33	0.39	0.33	47.4
All Vehicles		2732	4.6	0.506	4.0	LOS A	4.0	29.4	0.40	0.43	0.40	47.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Luis Riel and Marion]

Luis Riel and Marion
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Luis Riel												
1	L2	151	0.0	0.224	11.8	LOS B	1.1	8.0	0.75	0.89	0.75	43.3
2	T1	5	0.0	0.224	6.2	LOS A	1.1	8.0	0.75	0.85	0.75	42.8
3	R2	127	5.0	0.224	6.6	LOS A	1.1	8.0	0.75	0.85	0.75	44.0
Approach		283	2.2	0.224	9.3	LOS A	1.1	8.0	0.75	0.87	0.75	43.6
East: Marion												
4	L2	117	5.0	0.533	8.5	LOS A	4.4	31.8	0.54	0.49	0.54	46.3
5	T1	1221	5.0	0.533	3.9	LOS A	4.5	32.8	0.52	0.45	0.52	46.9
6	R2	11	10.0	0.533	4.2	LOS A	4.5	32.8	0.51	0.42	0.51	42.8
Approach		1348	5.0	0.533	4.3	LOS A	4.5	32.8	0.52	0.45	0.52	46.8
North: Access												
7	L2	14	10.0	0.052	11.7	LOS B	0.2	1.6	0.69	0.81	0.69	42.9
8	T1	5	0.0	0.052	6.7	LOS A	0.2	1.6	0.69	0.81	0.69	41.3
9	R2	11	0.0	0.052	6.7	LOS A	0.2	1.6	0.69	0.81	0.69	41.1
Approach		29	4.6	0.052	9.0	LOS A	0.2	1.6	0.69	0.81	0.69	42.0
West: Marion												
10	L2	6	1.0	0.625	8.5	LOS A	5.6	40.6	0.54	0.45	0.54	30.0
11	T1	1488	5.0	0.625	3.9	LOS A	5.7	41.1	0.52	0.44	0.52	47.1
12	R2	151	1.0	0.625	4.0	LOS A	5.7	41.1	0.50	0.43	0.50	45.0
Approach		1645	4.6	0.625	3.9	LOS A	5.7	41.1	0.52	0.44	0.52	46.8
All Vehicles		3306	4.6	0.625	4.6	LOS A	5.7	41.1	0.54	0.49	0.54	46.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Luis Riel and Marion]

Luis Riel and Marion
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Luis Riel												
1	L2	293	0.0	0.256	11.0	LOS B	1.3	9.2	0.72	0.88	0.72	43.8
2	T1	5	0.0	0.256	5.9	LOS A	1.3	9.2	0.72	0.86	0.72	41.3
3	R2	77	5.0	0.256	6.4	LOS A	1.3	9.2	0.72	0.86	0.72	43.0
Approach		375	1.0	0.256	10.0	LOS A	1.3	9.2	0.72	0.87	0.72	43.6
East: Marion												
4	L2	99	5.0	0.661	11.1	LOS B	6.7	48.6	0.77	0.75	0.86	45.2
5	T1	1344	5.0	0.661	6.0	LOS A	6.7	48.7	0.76	0.70	0.82	45.9
6	R2	20	10.0	0.661	6.1	LOS A	6.7	48.7	0.75	0.66	0.80	41.5
Approach		1463	5.1	0.661	6.4	LOS A	6.7	48.7	0.76	0.70	0.83	45.8
North: Access												
7	L2	13	10.0	0.068	12.9	LOS B	0.3	2.3	0.77	0.88	0.77	42.0
8	T1	5	0.0	0.068	7.9	LOS A	0.3	2.3	0.77	0.88	0.77	40.3
9	R2	13	0.0	0.068	7.9	LOS A	0.3	2.3	0.77	0.88	0.77	40.3
Approach		31	4.1	0.068	9.9	LOS A	0.3	2.3	0.77	0.88	0.77	41.0
West: Marion												
10	L2	18	1.0	0.588	8.3	LOS A	5.2	38.2	0.50	0.43	0.50	30.1
11	T1	1126	5.0	0.588	3.7	LOS A	5.4	38.6	0.49	0.43	0.49	47.2
12	R2	425	1.0	0.588	3.9	LOS A	5.4	38.6	0.47	0.44	0.47	45.2
Approach		1569	3.9	0.588	3.8	LOS A	5.4	38.6	0.48	0.43	0.48	46.5
All Vehicles		3438	4.1	0.661	5.6	LOS A	6.7	48.7	0.63	0.60	0.66	45.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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Roundabout Capacity Model: SIDRA Standard.
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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Luis Riel and Marion]

Luis Riel and Marion
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Luis Riel												
1	L2	405	0.0	0.561	16.4	LOS B	4.0	28.3	0.90	1.06	1.17	40.4
2	T1	5	0.0	0.561	10.5	LOS B	4.0	28.3	0.91	1.06	1.17	37.3
3	R2	160	5.0	0.561	10.9	LOS B	4.0	28.3	0.91	1.06	1.17	40.4
Approach		571	1.4	0.561	14.8	LOS B	4.0	28.3	0.90	1.06	1.17	40.3
East: Marion												
4	L2	117	5.0	0.677	13.0	LOS B	7.3	53.6	0.86	0.90	1.04	44.2
5	T1	1221	5.0	0.677	7.7	LOS A	7.6	55.6	0.85	0.85	1.01	45.3
6	R2	11	10.0	0.677	7.7	LOS A	7.6	55.6	0.85	0.82	0.99	41.0
Approach		1348	5.0	0.677	8.2	LOS A	7.6	55.6	0.85	0.86	1.01	45.2
North: Access												
7	L2	15	10.0	0.070	12.8	LOS B	0.3	2.3	0.78	0.88	0.78	41.8
8	T1	5	0.0	0.070	7.8	LOS A	0.3	2.3	0.78	0.88	0.78	40.1
9	R2	11	0.0	0.070	7.8	LOS A	0.3	2.3	0.78	0.88	0.78	40.1
Approach		31	4.8	0.070	10.2	LOS B	0.3	2.3	0.78	0.88	0.78	41.0
West: Marion												
10	L2	7	1.0	0.777	8.9	LOS A	9.3	67.9	0.72	0.50	0.72	29.5
11	T1	1598	5.0	0.777	4.3	LOS A	9.5	68.6	0.70	0.49	0.70	46.4
12	R2	426	1.0	0.777	4.3	LOS A	9.5	68.6	0.67	0.48	0.67	44.4
Approach		2032	4.1	0.777	4.3	LOS A	9.5	68.6	0.69	0.49	0.69	45.9
All Vehicles		3981	4.1	0.777	7.2	LOS A	9.5	68.6	0.78	0.70	0.87	44.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Maginot and Speers]

Maginot and Speers
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Speers												
1	L2	4	0.0	0.017	8.0	LOS A	0.1	0.6	0.35	0.42	0.35	47.8
2	T1	18	0.0	0.017	3.5	LOS A	0.1	0.6	0.35	0.42	0.35	47.6
3	R2	199	5.0	0.107	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		221	4.5	0.107	2.7	LOS A	0.1	0.6	0.04	0.38	0.04	47.8
East: Maginot												
4	L2	94	5.0	0.130	7.5	LOS A	0.6	4.7	0.15	0.47	0.15	46.8
5	T1	103	5.0	0.130	3.0	LOS A	0.6	4.7	0.15	0.47	0.15	46.6
6	R2	100	10.0	0.056	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		297	6.7	0.130	4.2	LOS A	0.6	4.7	0.10	0.44	0.10	47.1
North: Speers												
7	L2	38	10.0	0.047	8.3	LOS A	0.2	1.7	0.36	0.56	0.36	45.3
8	T1	5	0.0	0.047	3.7	LOS A	0.2	1.7	0.36	0.56	0.36	46.5
9	R2	9	0.0	0.047	3.7	LOS A	0.2	1.7	0.36	0.56	0.36	45.5
Approach		53	7.2	0.047	7.0	LOS A	0.2	1.7	0.36	0.56	0.36	45.5
West: Maginot												
10	L2	24	0.0	0.161	8.0	LOS A	0.8	5.9	0.31	0.42	0.31	48.1
11	T1	167	0.0	0.161	3.5	LOS A	0.8	5.9	0.31	0.42	0.31	47.1
12	R2	9	0.0	0.161	3.5	LOS A	0.8	5.9	0.31	0.42	0.31	46.8
Approach		201	0.0	0.161	4.0	LOS A	0.8	5.9	0.31	0.42	0.31	47.3
All Vehicles		772	4.4	0.161	3.9	LOS A	0.8	5.9	0.15	0.42	0.15	47.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Maginot and Speers]

Maginot and Speers
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Speers												
1	L2	7	0.0	0.014	8.0	LOS A	0.1	0.5	0.34	0.47	0.34	47.4
2	T1	12	0.0	0.014	3.5	LOS A	0.1	0.5	0.34	0.47	0.34	47.2
3	R2	128	5.0	0.069	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		147	4.4	0.069	2.8	LOS A	0.1	0.5	0.04	0.38	0.04	47.8
East: Maginot												
4	L2	132	5.0	0.215	7.4	LOS A	1.2	8.7	0.11	0.44	0.11	47.3
5	T1	212	5.0	0.215	2.9	LOS A	1.2	8.7	0.11	0.44	0.11	47.1
6	R2	22	10.0	0.012	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		365	5.3	0.215	4.5	LOS A	1.2	8.7	0.11	0.44	0.11	47.2
North: Speers												
7	L2	58	10.0	0.092	9.2	LOS A	0.5	3.4	0.48	0.61	0.48	45.2
8	T1	18	0.0	0.092	4.5	LOS A	0.5	3.4	0.48	0.61	0.48	46.5
9	R2	17	0.0	0.092	4.5	LOS A	0.5	3.4	0.48	0.61	0.48	45.4
Approach		93	6.3	0.092	7.5	LOS A	0.5	3.4	0.48	0.61	0.48	45.6
West: Maginot												
10	L2	4	0.0	0.152	8.3	LOS A	0.8	5.6	0.39	0.44	0.39	48.1
11	T1	156	0.0	0.152	3.8	LOS A	0.8	5.6	0.39	0.44	0.39	47.1
12	R2	17	0.0	0.152	3.9	LOS A	0.8	5.6	0.39	0.44	0.39	46.8
Approach		177	0.0	0.152	3.9	LOS A	0.8	5.6	0.39	0.44	0.39	47.1
All Vehicles		782	4.0	0.215	4.4	LOS A	1.2	8.7	0.20	0.45	0.20	47.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Maginot and Speers]

Maginot and Speers
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Speers												
1	L2	5	0.0	0.089	8.5	LOS A	0.5	3.3	0.47	0.47	0.47	47.7
2	T1	104	0.0	0.089	4.0	LOS A	0.5	3.3	0.47	0.47	0.47	47.5
3	R2	189	5.0	0.102	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		299	3.2	0.102	3.1	LOS A	0.5	3.3	0.17	0.41	0.17	47.7
East: Maginot												
4	L2	93	5.0	0.149	8.2	LOS A	0.8	5.7	0.38	0.53	0.38	46.0
5	T1	101	5.0	0.149	3.7	LOS A	0.8	5.7	0.38	0.53	0.38	45.8
6	R2	181	10.0	0.101	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		375	7.4	0.149	4.2	LOS A	0.8	5.7	0.20	0.45	0.20	46.8
North: Speers												
7	L2	80	10.0	0.146	8.5	LOS A	0.8	5.8	0.40	0.55	0.40	46.0
8	T1	40	0.0	0.146	3.8	LOS A	0.8	5.8	0.40	0.55	0.40	47.0
9	R2	45	0.0	0.146	3.8	LOS A	0.8	5.8	0.40	0.55	0.40	46.0
Approach		165	4.8	0.146	6.1	LOS A	0.8	5.8	0.40	0.55	0.40	46.3
West: Maginot												
10	L2	112	0.0	0.237	8.5	LOS A	1.4	9.5	0.43	0.55	0.43	47.2
11	T1	154	0.0	0.237	4.0	LOS A	1.4	9.5	0.43	0.55	0.43	45.9
12	R2	9	0.0	0.237	4.0	LOS A	1.4	9.5	0.43	0.55	0.43	45.9
Approach		275	0.0	0.237	5.8	LOS A	1.4	9.5	0.43	0.55	0.43	46.5
All Vehicles		1114	4.1	0.237	4.6	LOS A	1.4	9.5	0.28	0.48	0.28	46.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Maginot and Speers]

Maginot and Speers
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Speers												
1	L2	7	0.0	0.071	8.7	LOS A	0.4	2.7	0.50	0.50	0.50	47.5
2	T1	77	0.0	0.071	4.2	LOS A	0.4	2.7	0.50	0.50	0.50	47.3
3	R2	119	5.0	0.064	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		203	2.9	0.071	3.4	LOS A	0.4	2.7	0.21	0.42	0.21	47.6
East: Maginot												
4	L2	117	5.0	0.234	8.0	LOS A	1.3	9.5	0.34	0.48	0.34	46.5
5	T1	203	5.0	0.234	3.4	LOS A	1.3	9.5	0.34	0.48	0.34	46.3
6	R2	64	10.0	0.036	2.5	LOS A	0.0	0.0	0.00	0.37	0.00	47.8
Approach		384	5.8	0.234	4.7	LOS A	1.3	9.5	0.28	0.47	0.28	46.6
North: Speers												
7	L2	178	10.0	0.392	9.7	LOS A	2.6	18.8	0.60	0.66	0.60	45.3
8	T1	113	0.0	0.392	4.9	LOS A	2.6	18.8	0.60	0.66	0.60	46.5
9	R2	111	0.0	0.392	5.0	LOS A	2.6	18.8	0.60	0.66	0.60	45.5
Approach		401	4.4	0.392	7.1	LOS A	2.6	18.8	0.60	0.66	0.60	45.8
West: Maginot												
10	L2	71	0.0	0.242	9.6	LOS A	1.5	10.3	0.60	0.64	0.60	46.8
11	T1	147	0.0	0.242	5.1	LOS A	1.5	10.3	0.60	0.64	0.60	45.4
12	R2	18	0.0	0.242	5.2	LOS A	1.5	10.3	0.60	0.64	0.60	45.6
Approach		236	0.0	0.242	6.5	LOS A	1.5	10.3	0.60	0.64	0.60	45.9
All Vehicles		1224	3.8	0.392	5.6	LOS A	2.6	18.8	0.43	0.56	0.43	46.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Stantec

Development of MRS-D Traffic Impact Study

Final Report

February 11 2020
Rev 2 May 2020



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