

**Transportation
Impact Study
Update**

**PROPOSED
RESIDENTIAL
DEVELOPMENT**

175 John Street North,
HAMILTON, ONTARIO

November 2024
Project No: NT-22-096

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nexTrans
CONSULTING ENGINEERS

NextEng Consulting Group Inc.

November 27, 2024

Attention: Stephen Erickson

Urban Solutions Planning & Land Development
3 Studebaker Place, Unit 1
Hamilton, ON L8L 0C8

**Re: Transportation Impact Study Update – Version 2
Proposed Residential Development
175 John Street North, City of Hamilton
Our Project No. NT-22-096**

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) is pleased to present the enclosed Transportation Impact Study Update (version 2) in support of Official Plan Amendment and Zoning By-law Amendment applications for a proposed residential development in Downtown Hamilton. It should be noted that NexTrans has prepared the original Transportation Impact Study dated December 2022 and Transportation Impact Study Update dated January 2024 in support of the previous development proposal. The purpose of this Study Update is to address the City's comments, as well as updating the latest development proposal and statistics.

The subject site is located at 175 John Street North, west of John Street North, north of Cannon Street E, in the City of Hamilton. The subject site is currently occupied by one and two-storey building (Italian Bakery) and a surface parking lot. The current development proposal consists of one 12-storey high-rise building with a total of 128 residential dwelling units. The proposed development also provides a total of 42 vehicle parking spaces and 102 bicycle parking spaces (including 5 short-term and 100 long-term spaces).

This Transportation Impact Study Update is consistent with the previous Study and prepared in accordance with the approved study terms of reference and consistent with the City's Transportation Impact Study Guidelines. The Study Update concludes that the proposed development can adequately be accommodated by the existing transportation network, existing Hamilton Transit service, the re-instated 14-km Light-Rail-Transit project through the Downtown Hamilton area, as well as the recommended Transportation Demand Management measures and incentives recommended in this report.

We trust the enclosed sufficiently addresses your needs. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Nextrans Consulting Engineers

A Division of NextEng Consulting Group Inc.

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Report Submission Record

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CITY OF HAMILTON COMMENTS

The following comments were received from the City of Hamilton on the latest submission and appropriate responses have been provided below and throughout this Study Update:

1. **Comment #1** – The TIS states that the development will provide one bicycle repair station on-site. The site plan and floor plan that Transportation Planning reviewed need to identify the location of the bicycle repair station. The TIS stated in “Figure 12-Potential Bicycle Repair Station Location”.

Response: Noted. The proposed location of a potential bicycle repair station is illustrated in the revised site plan.

2. **Comment #2** – There is a discrepancy between existing traffic and background traffic. Existing southbound John Street North and Robert Street have 106 PM and 77 AM trips, and the background growth has 106 PM and 77 AM trips. There should be a difference between at a rate of 1% for 8 years should be an increase of 8 vehicles.

Response: Noted. These numbers have been revised and reflected in this Study Update. It should be noted that these numbers are small and have no impacts on the conclusions of the TIS.

3. **Comment #3** – 7.3. Traffic Calming states that traffic calming is “not required on John Street North in the proximity of the proposed development at this time”. “At this time” indicates that traffic calming will be required, so at what time would traffic calming be required?

Response: The texts have been revised to say “Traffic Calming is not required under the horizon analysis year”. Traffic calming assessment may be undertaken beyond the horizon year considered in this analysis.

4. **Comment #4** – 8.1 Zoning By-law Vehicle Parking Requirements- Use the most up-to-date Zoning By-law. The 2009 Zoning by-law is out of date as of the time of the TIS update. The Traffic Consultant should be using the 2021 Zoning By-law 05-200. Further updates should be using current By-laws and policies.

Response: Noted and has been reflected in Section 8.0 of this Study Update.

5. **Comment #5** – The proposed reduction in parking by 65% (77) parking spaces is aggressive. Please provide justification and reasoning for the proposed reduction in parking provided.

Response: Based on the City’s By-Law No. 05-200, a minimum of 9 and a maximum of 128 vehicle parking spaces are required for the proposed development. Based on the recommendations of this Study Update and comprehensive justifications provided, the proposed development only needs to provide a total of 42 vehicle parking spaces (including 9 visitor and 33 resident spaces), which exceeds the minimum Zoning By-law requirement and represents a reduction of 67% vehicle parking spaces from the maximum allowable in the Zoning By-law. Our analysis indicates that this recommended reduction is required and necessary to support TDM, as noted in Section 10 of this Study Update.

6. **Comment #6** – 8.3.3 Existing Modal Share; Transportation Planning notes that this development is technically not part of the Downtown area; it is outside the downtown area.

Response: Noted and has been revised in this Study Update. It should be noted that the modal split information has been used in the Study as the City does not allow trip reduction based on the 2016 TTS data modal split information.

7. **Comment #7** – 10.1.3. The description of the Sidewalks and Pathways is describing a different area of the City of Hamilton.

Response: Noted, these were typos and have been revised in this Study Update.

8. **Comment #8** – The AutoTURN Analysis MSU TAC-2017 has the vehicle colliding with the building. See Figure 3

Response: The vehicle turning diagrams have been revised and demonstrated that the MSU TAC-2017 vehicles can maneuver within the site.

9. **Comment #9** – Cannon Street and John Street, the Traffic consultant has identified that there was a vehicle driving in the wrong direction on cannon and not identified as bicycles on the cycle track. (page 113 on the electronic pdf)

Response: Noted. This however does not affect the analysis as the volume is very small and does not require a separate phase for the signal. Therefore, it has no impact on the analysis and the recommendations of this Study Update.

10. **Comment #10** – Appendix C Background Developments; The highlighted numbers below are incorrect number of trips.

Response: Noted and these numbers have been revised and reflected in the analysis in this Study Update.

11. **Comment #11** – Neighbourhood Traffic Calming Options Report – Clarification Required

The Traffic Consultant stated in 7.3. Traffic Calming is “not required on John Street North in the proximity of the proposed development at this time”. “At this time” indicates that traffic calming will be required, so at what time would traffic calming be required?

Response: This comment is a repeat of Comment #3 above. The texts have been revised to say “Traffic Calming is not required under the horizon analysis year”. Traffic calming assessment may be undertaken beyond the horizon year considered in this analysis.

12. **Comment #12** – The Site Plan must be revised to illustrate a turning plan in the underground parking. Turning radii for the parking entrance and for ramps between levels may not be adequate. A turning plan must demonstrate adequate space for two-way flow or otherwise mitigate conflicts with structures/vehicles.

Response: Noted. The vehicle turning movement diagrams in and out the proposed underground ramp are illustrated in **Figures 13** through **16**.

13. **Comment #13** – Provide short-term bicycle parking within the property limits as per the City of Hamilton Zoning By-Law 05-200 for the proposed land use type

Response: Noted and this requirement has been addressed in Section 9 of this Study Update.

14. **Comment #14** – Provide long-term bicycle parking that is secure and shielded from the elements as per the City of Hamilton Zoning By-Law 05-200 for the proposed land use type

Response: Noted and this requirement has been addressed in Section 9 of this Study Update.

15. **Comment #15** – The Applicant/Owner must provide a turning plan that illustrates how vehicles will access the ramp down to the Underground Parking

Response: Noted. The vehicle turning movement diagrams in and out the proposed underground ramp are illustrated in **Figures 13** through **16**.

16. **Comment #16** – The turning plan for the MSU TAC-2017 is demonstrating the vehicle driving over the curb.

Response: Please refer to **Figures 13** through **16** of this Study Update as vehicles do not hit the curb.

17. **Comment #17** – Passenger car contacting structure.

Response: Please see revised vehicle diagram movements illustrated in **Figures 13** through **16** of this Study Update. Please note that these are pavement markings not part of the structure.

EXECUTIVE SUMMARY

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Urban Solutions Planning & Land Development (the 'Client') to undertake a Transportation Impact Study Update (version 2) in support of Official Plan Amendment and Zoning By-law Amendment applications for a proposed residential development in Downtown Hamilton. It should be noted that NexTrans has prepared the original Transportation Impact Study dated December 2022 and Transportation Study Update dated January 2024 in support of the previous applications. The purpose of this Study Update is to address the City's comments, as well as updating the latest development proposal and statistics.

The subject site is located at 175 John Street North, west of John Street North, north of Cannon Street E, in the City of Hamilton. This Study is prepared in consistent with the previous Study and in accordance with the Terms of Reference (**Appendix G**) and the City of Hamilton Traffic Impact Study Guidelines.

Proposed Development

The subject site is currently occupied by one and two-storey building (Italian Bakery) and a surface parking lot. The current development proposal consists of one 12-storey high-rise building with a total of 128 residential dwelling units.

Proposed Development Access

Under the existing conditions, the subject site has two accesses onto John Street North that operates as a one-way system, with the inbound traffic at the south access and outbound traffic at the north access due to the nature of the angled parking configurations. In the future with the redevelopment of the site, only one full moves access will be provided onto John Street North at the northerly limit of the site to service the proposed development. This access arrangement will reduce and eliminate conflict points for pedestrians, cyclist and vehicles along John Street N. The analysis indicates that the proposed development site access onto John Street North is expected to operate at acceptable levels of service with minimal queue or delay. No improvements such as exclusive turning lanes are required for the proposed site access.

The proposed site access lane configurations include:

- One inbound lane and one outbound lane (with minimum width to reduce pedestrian crossing); and
- One southbound shared through/right lane and one northbound shared through/left lane

Transportation and Land Use Planning Context

Based on Nextrans comprehensive review of the study area, it is evident that there is a wide range of different types of land uses and housing types currently exist in the Downtown area such as residential (including rental) and retail/commercial (banks, grocery stores, restaurants, medical/professional offices, government offices) along main public streets. As indicated, with the excellent existing HSR transit system service and the Future Rapid Transit Corridor along King Street in the Downtown Core, the proposed development represents good transportation planning since it will contribute a healthy transit ridership for both the existing conventional HSR transit system and the Future Rapid Transit.

Transportation Capacity Analysis

The proposed development is expected to generate:

- 19 total two-way transit trips (10 inbound and 9 outbound) during the weekday morning peak hour and 9 total two-way transit trips (5 inbound and 4 outbound) during the afternoon peak hour;
- 32 total two-way walk trips (14 inbound and 18 outbound) during the weekday morning peak hour and 35 total two-way walk trips (15 inbound and 20 outbound) during the afternoon peak hour; and
- 47 total two-way auto trips (16 inbound and 31 outbound) during the weekday morning peak hour and 56 total two-way auto trips (31 inbound and 25 outbound) during the afternoon peak hour

Auto Mode Assessment

The analysis indicates that under the existing, future background and future total conditions, all signalized and unsignalized intersections are expected to operate at acceptable levels of service during the morning and afternoon peak periods. Similar to the existing conditions, these intersections are only expected to operate slightly over 50% of the intersection capacity, therefore, there are expected ample of capacity to accommodate future developments in the area. No physical improvements or signal timing optimizations are required under this horizon year. The forecast queues are expected to be accommodated by the existing available storage length at these intersections.

Transit Mode Assessment

The proposed development is expected to generate 20 total two-way transit trips (10 inbound and 10 outbound) and 9 total two-way auto trips (5 inbound and 4 outbound) during the morning and afternoon peak hours, respectively.

Based on the assessment in this Study, the proposed development site generated transit trips can be accommodated by the existing conventional transit alone without any improvements to the existing transit system. It is NexTrans' understanding that the Province has cancelled the proposed Light Rail Transit (LRT) in 2019 due to project rising costs. However, in February, 2021, the Province has recommitted this project with some funding contribution from various levels of government. Based on the information obtained from the Metrolinx website (www.metrolinx.com), the Hamilton LRT project will play a key role in the revitalization of Hamilton's urban environment by transforming how residents travel across the heart of the city. Modern light rail service will connect key areas, destinations and institutions along Main Street, King Street and Queenston Road, creating a 14-kilometre multi-modal corridor and an enhanced streetscape.

It anticipated that the residents and employees from the proposed development will walk to the Downtown Hamilton Transit Terminal, MacNab Terminal or the future LRT along King Street, instead of taking any local transit routes or drive to the stations. Therefore, the proposed development is expected to have minimal or negligible impact on the existing and future transit system. The analysis indicates that the proposed development will contribute a healthy transit ridership for both the existing conventional HSR transit system and the LRT along King Street.

Walking Mode Assessment

The area is currently well serviced by a complete network of sidewalk. Sidewalks are available on both sides of all public streets in the study area. There are no missing gaps or links identified as per our observation and site visit. The sidewalks are generally in good condition and reasonably maintained on the public streets.

As part of the proposed development, the existing sidewalk on John Street North will be maintained and enhanced to provide good pedestrian experience. There will be sufficient lighting in along the frontage of the building that will provide security for pedestrians on John Street North.

Cycling Mode Assessment

Under the existing conditions, there are dedicated bicycle facilities along the south side of Cannon Street E, on York Boulevard west of James Street N, west side of Bay Street N and Ferguson Avenue N available. Based on NexTrans' review and assessment, a better and more connected bicycle network along other east-west and north-south streets should be implemented as part of future City's capital projects. A complete bicycle network will help increase cycling trips and reduce the numbers of single-occupant-vehicle trips to and from the area.

As part of the proposed development, a total of 102 bicycle parking spaces will be provided to encourage residents to use active and more sustainable mode of transportation instead of driving private vehicles to and from the proposed development. NexTrans recommends that the proposed development provide one bicycle repair station on-site, at a convenient location such as close to the main building entrance or within the bicycle parking locker area. The final location will be determined through the subsequent stage of the proposed development.

Transportation Demand Management Measures and Incentives

This Study identifies and recommends a number of appropriate Transportation Demand Management measures and incentives to support active transportation and transit in order to meet the objectives and requirements as documented in the City of Hamilton's TDM for Development Report (June, 2015).

Vehicle Parking Review

Based on the City's By-Law No. 05-200, a minimum of 9 and a maximum of 128 vehicle parking spaces are required for the proposed development. Based on the recommendations of this Study Update and comprehensive justifications provided, the proposed development only needs to provide a total of 42 vehicle parking spaces (including 9 visitor and 33 resident spaces), which exceeds the minimum Zoning By-law requirement and represents a reduction of 67% vehicle parking spaces from the maximum allowable in the Zoning By-law. Our analysis indicates that this recommended reduction is required and necessary to support TDM, as noted in Section 9 of this Study Update.

Bicycle Parking Review

Based on the current Zoning By-law requirement, the proposed development requires a total of 102 bicycle parking spaces (13 short-term and 89 long-term). The proposed development will provide a total of 89 long-term and 13 short-term spaces, for a total of 102 bicycle parking spaces. This meets the Zoning By-law requirement and this provision will encourage future residents to use active mode of transportation to and from the proposed development. This provision will also support the recommended vehicle parking reduction noted above.

Loading Requirement

The proposed development provides one on-site loading spaces for servicing vehicles (garbage and delivery trucks) to service the proposed building. The detailed AutoTURN analysis has been provided to demonstrate the maneuverability of the largest servicing vehicles that will service the proposed development.

Study Recommendations

Based on the assessment and findings of this Study, the following recommendations are provided:

- The City approves the proposed development as the proposed development has minimum or negligible impacts on the existing transportation system;
- The proposed development provides minimum width for the proposed full moves access onto John Street N to minimize crossing distance for pedestrians and cyclists;
- The proposed development provides sufficient lighting at the proposed access to enhance security for pedestrians and cyclists;
- The proposed development only provides a total of 42 vehicle parking spaces instead of maximum allowable 128 vehicle parking spaces, as recommended in this Study;
- The proposed development provides 102 bicycle parking spaces;
- The proposed development provides one bicycle repair station on-site, at a convenient location;
- The proposed development implements the Transportation Demand Management (TDM) measures and incentives identified in Section 9 of this report to support active transportation and public transit, to meet the objectives and requirements by the City of Hamilton; and
- No physical improvements are required at the boundary intersections to accommodate the proposed development

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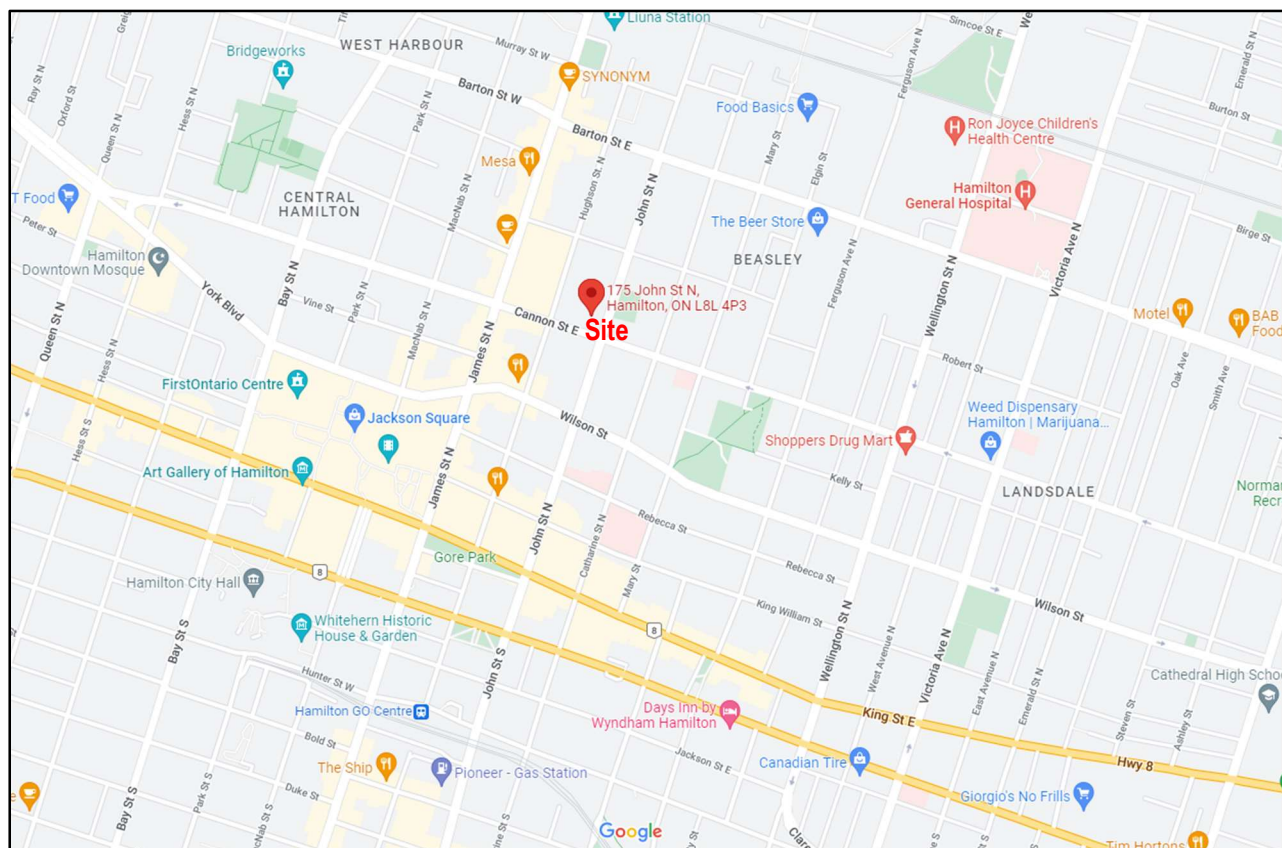
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1.0 INTRODUCTION

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Urban Solutions Planning & Land Development (the ‘Client’) to undertake a Transportation Impact Study Update in support of Official Plan Amendment and Zoning By-law Amendment applications for a proposed residential development in Downtown Hamilton. It should be noted that NexTrans has prepared the original Transportation Impact Study dated December, 2022 in support of the previous development proposal. The purpose of this Study Update is to address the City’s comments, as well as updating the latest development proposal and statistics.

The subject site is located at 175 John Street North, west of John Street North, north of Cannon Street E, in the City of Hamilton. The location of the proposed development is illustrated in **Figure 1**. This Study is prepared in consistent with the previous Study and in accordance with the Terms of Reference (**Appendix G**) and the City of Hamilton Traffic Impact Study Guidelines.

Figure 1 – Proposed Development Location



Source: Google Map

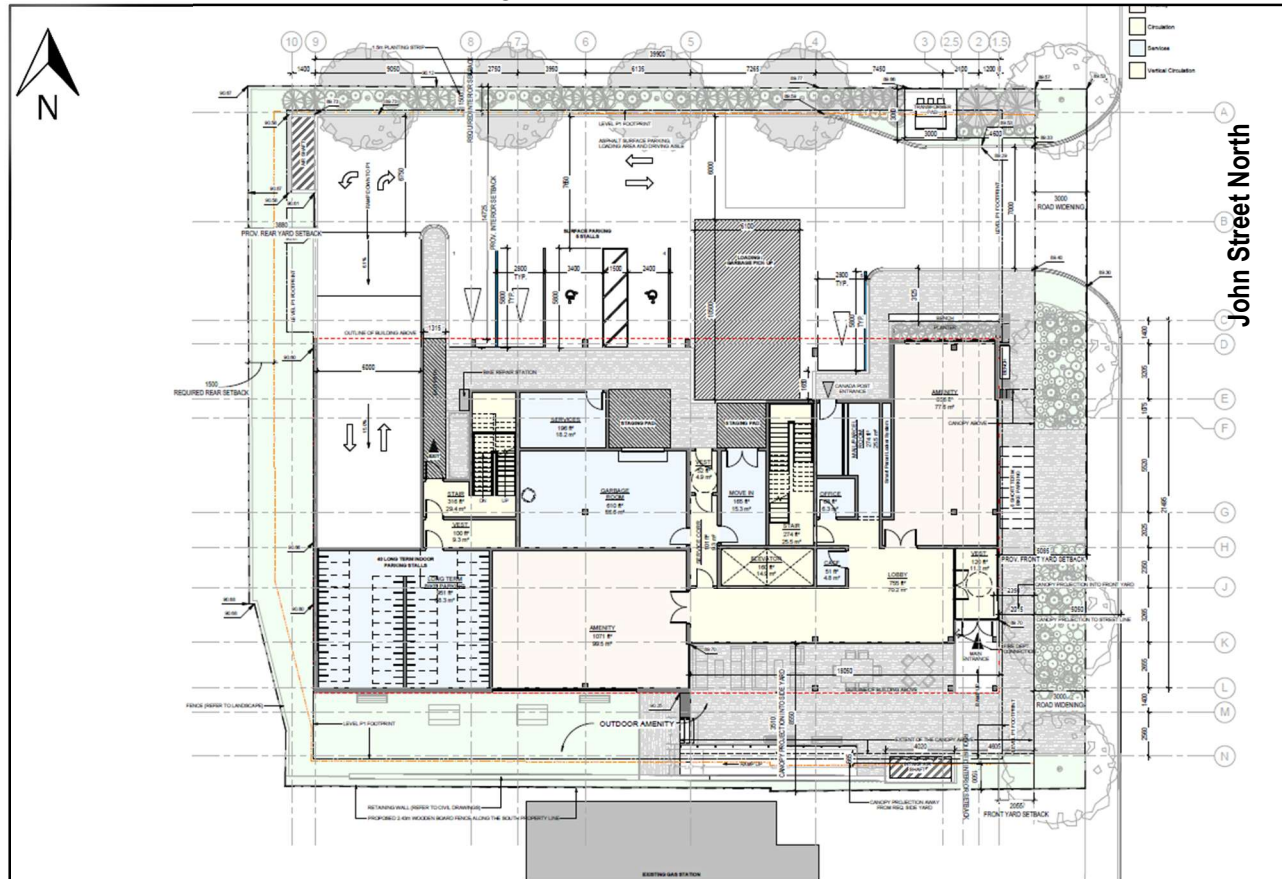
The subject site is currently occupied by one and two-storey building (Italian Bakery) and a surface parking lot. The proposed development consists of one 12-storey high-rise building with a total of 128 residential dwelling units.

Under the existing conditions, the subject site has two accesses onto John Street North that operates as a one-way system, with the inbound traffic at the south access and outbound traffic at the north access due to the nature of the angled parking configurations.

In the future with the redevelopment of the site, only one full moves access will be provided onto John Street North at the northerly limit of the site to service the proposed development. This access arrangement will reduce and eliminate conflict points for pedestrians, cyclist and vehicles along John Street N.

Based on the recommendations of this Study, the proposed development also provides a total of 42 vehicle parking spaces and 102 bicycle parking spaces.

Figure 2 – Proposed Site Plan



2.0 EXISTING TRANSPORTATION CONDITIONS

2.1. Existing Road Network

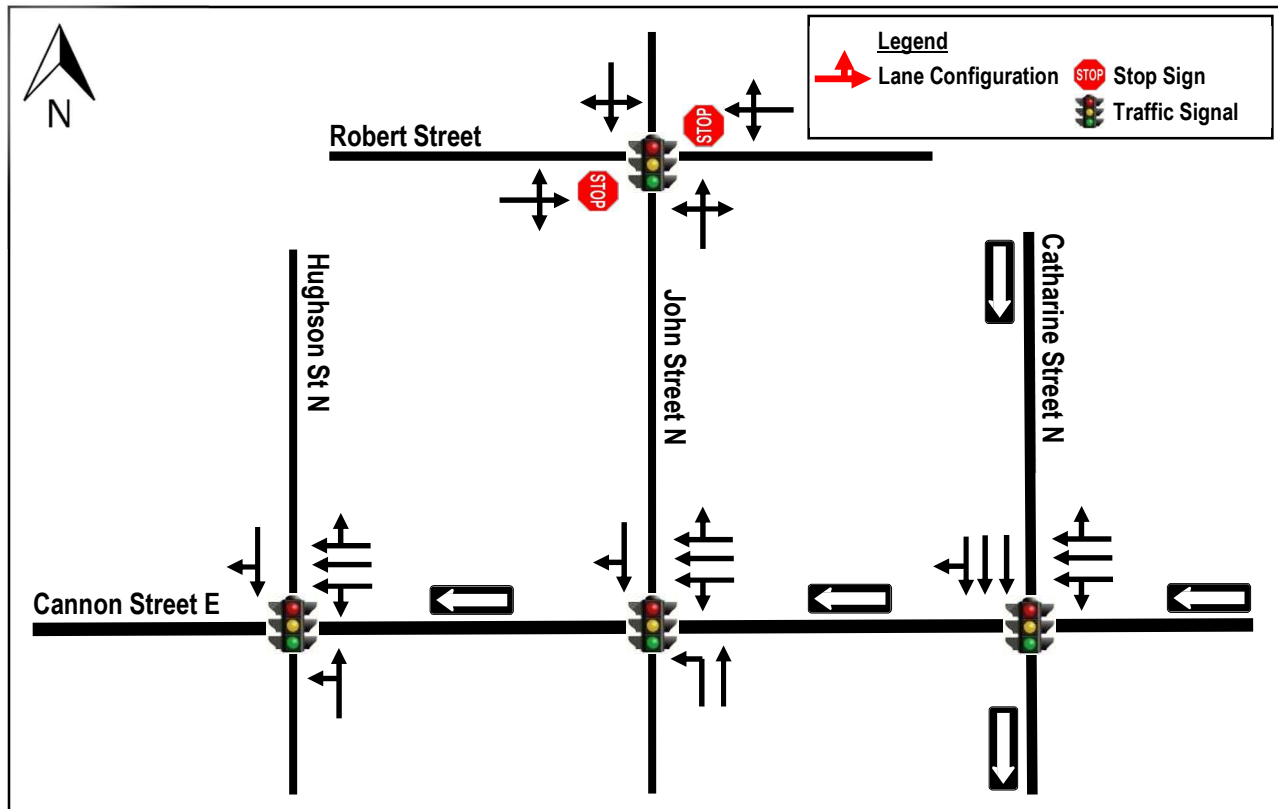
The existing road network, lane configuration and existing traffic control for the study area are shown in **Figure 3**. The description of the existing road network in the study area is summarized in **Table 1** below.

Table 1 – Summary of the Existing Road Network

Road Name	Jurisdiction	Number of Lanes	Sidewalk/Bike Lane	Speed
Cannon Street E	City of Hamilton	Generally, 3-lane cross-section with one-way westbound	Sidewalks are on both sides of the street, with bike lanes	50 km/h
Hughson Street S	City of Hamilton	Generally, 2-lane cross-section with on-street parking on east side	Sidewalks are on both sides of the street, no bike lanes	40 km/h
John Street N	City of Hamilton	Generally, 2-lane cross-section with on-street parking on the east side	Sidewalks are on both sides of the street, no bike lanes	40 km/h
Catharine Street N	City of Hamilton	Generally, 3-lane cross-section southbound one-way	Sidewalks are on both sides of the street, no bike lanes	40 km/h
Robert Street	City of Hamilton	Generally, 2-lane cross-section with on-street parking on both sides	Sidewalks are on both sides of the street, no bike lanes	40 km/h

The road network is generally well laid out in a fine grid system in both the north-south and east-west directions, with both two-way and one-way street systems.

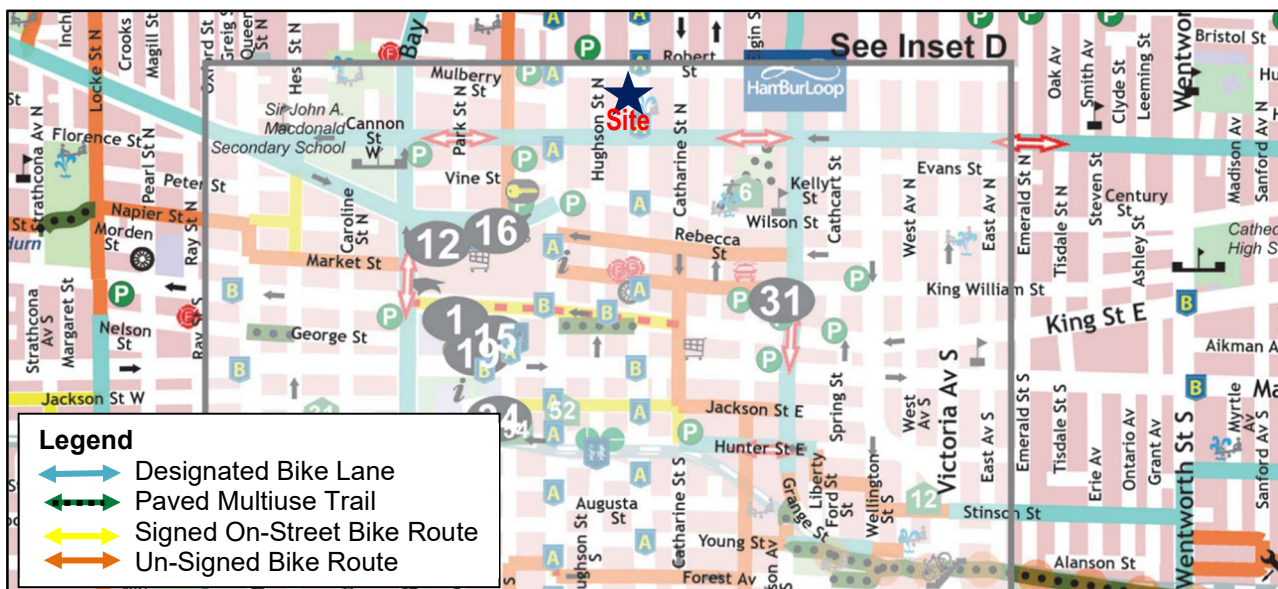
Figure 3 – Existing Lane Configurations and Traffic Control Devices



2.3. Existing Active Transportation Assessment

Under the existing conditions, sidewalks are generally available on both sides of the public streets, and there are existing dedicated cycling facilities in the study area. Figure 4 illustrates the cycling network in the study area.

Figure 4 – Existing Bicycle Network in the Study Area (Hamilton Cycling Map)



2.3.1. Walk Score

Nextrans has reviewed the walk score for the subject site using the information in www.walkscore.com website. Table 2 below summarizes the walk score for the subject site.

Table 2 – Walk Score for 175 John Street North, Hamilton

Mode	Score	Description
Walking	99	Walker's Paradise – Daily errands do not require a car
Public Transit	83	Excellent Transit – Transit is convenient for most trips
Cycling	93	Biker's Paradise – Daily errands can be accomplished on a bike

As indicated in the table above, the area has excellent multimodal transportation such as walking, cycling and transit. Daily errands do not require a car. For these reasons, vehicle parking should be reduced and discourage in order to continue this excellent trend.

2.3.2. Walking Mode Assessment

The area is currently well serviced by a complete network of sidewalk. Sidewalks are available on both sides of all public streets in the study area such as John Street North, Cannon Street E, Catharine Street N and Hughson Street N. There are no missing gaps or links identified as per our observation and site visit. The sidewalks are generally in good condition and reasonably maintained on the public streets. Based on NexTrans' review and assessment, no improvements are required to the sidewalk network under the existing conditions on the public streets at this time.

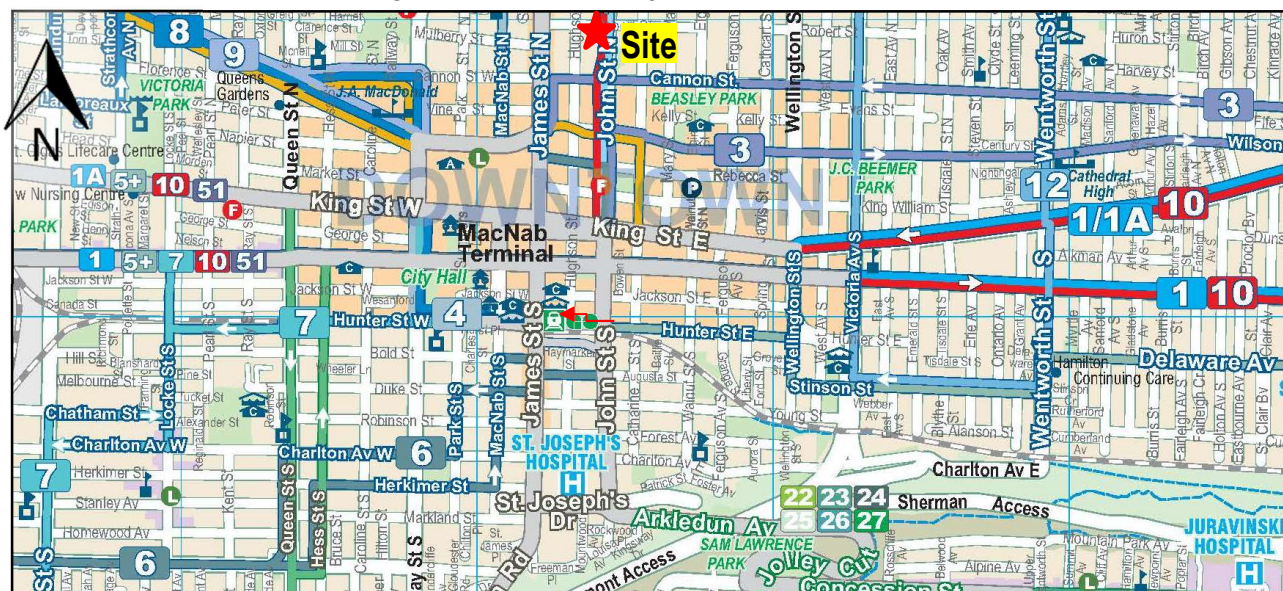
2.3.3. Cycling Mode Assessment

Under the existing conditions, there are dedicated bicycle facilities along the south side of Cannon Street E, on York Boulevard west of James Street N, west side of Bay Street N and Ferguson Avenue N available. Based on NexTrans' review and assessment, it is indicated that a better and more connected bicycle network along other east-west and north-south streets should be implemented as part of future City's capital projects. A complete bicycle network will help increase cycling trips and reduce the numbers of single-occupant-vehicle trips to and from the area.

2.4. Existing Transit Assessment

Figure 5 illustrates the existing HSR Transit Bus Routes in the study area based on Hamilton Transit System map.

Figure 5 – HSR Transit System Map for the Area



As indicated in **Figure 5**, the area is currently well serviced by the existing transit network. The proposed development has excellent access to the public transit because the proposed development is located:

- Less than 900 m (about 12 minute-walk) to Hamilton GO Centre, which includes GO Train and Bus services, as well as HSR Transit Bus Routes;
- About 900 m (about 12 minute-walk) to MacNab Transit Terminal; and
- Adjacent to Cannon Street and John Street transit stops

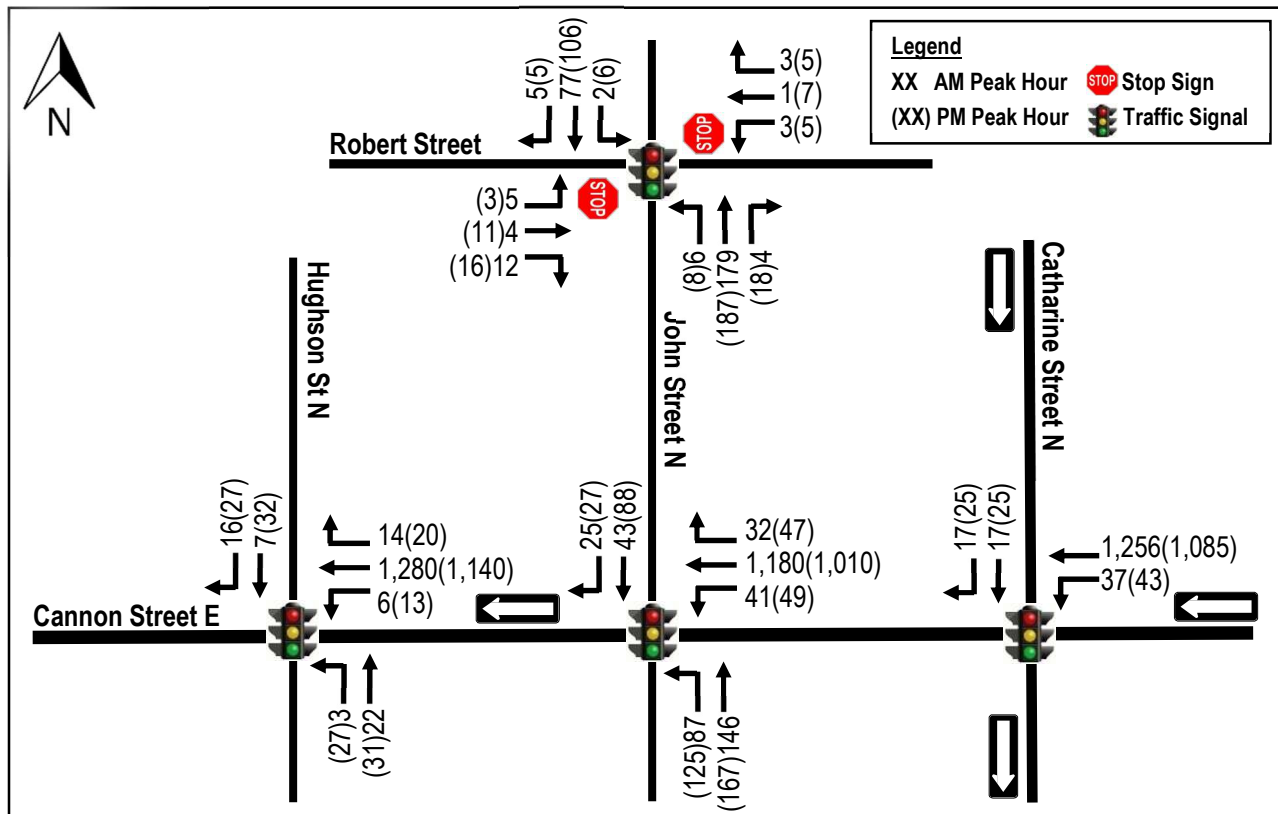
It is NexTrans' understanding that the Province has cancelled the proposed Light Rail Transit (LRT) in 2019 due to project rising costs. However, in February, 2021, the Province has recommitted this project with some funding contribution from various levels of government. Based on the information obtained from the Metrolinx website (www.metrolinx.com), the Hamilton LRT project will play a key role in the revitalization of Hamilton's urban environment by transforming how residents travel across the heart of the city. Modern light rail service will connect key areas, destinations and institutions along Main Street, King Street and Queenston Road, creating a 14-kilometre multi-modal corridor and an enhanced streetscape.

Our review and assessment indicate that the proposed development will contribute a healthy transit ridership for both the existing conventional HSR transit system and 14-km LRT through the City.

2.5. Existing Traffic Volumes

Existing traffic volumes at the study area intersections were undertaken by Spectrum on Wednesday September 21, 2022 during the morning (7:00 a.m. to 10:00 a.m.) and afternoon (4:00 p.m. to 7:00 p.m.) peak periods for all area intersections. Turning movement count summaries are provided in **Appendix A**. The existing traffic turning movement counts with adjustment are illustrated in **Figure 6**.

Figure 6 – Existing Traffic Volumes



2.6. Existing Traffic Assessment

The existing volumes are illustrated in **Figure 6** and analyzed using Synchro 11 Software. It should be noted that the printouts for unsignalized intersections are based on HCM 2000 outputs and the results for signalized intersections are based on Synchro Lanes, Volumes and Timings so that queues and more detailed information are provided. The detailed results are provided in **Appendix B** and summarized in **Table 3**. Nextrans requested and received the existing traffic signal timing plans from the City of Hamilton for the three existing signalized intersections considered in the analysis. The input parameters outlined in the signal timing plans such as cycle lengths, yellow and all-red intervals, minimum initials, extensions, walk and flash don't walk, offsets and maximum green times have been reflected in the analysis.

Table 3 – Existing Levels of Service

Intersection	Key Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage (m)
		LOS (v/c)	Delay (s)	95 th Queue(m)	LOS (v/c)	Delay (s)	95 th Queue(m)	
Cannon Street E/ John Street N (signalized)	Overall	B (0.50)	13		B (0.38)	13		
	WB – LTR	B (0.50)	11	63	A (0.38)	8	45	~115
	NB – L	C (0.20)	22	23	C (0.35)	28	35	~85
	NB – T	C (0.26)	22	35	C (0.34)	27	42	~85
	SB – TR	B (0.12)	14	15	C (0.22)	22	28	~60
Cannon Street E/ Hughson Street N (signalized))	Overall	A (0.45)	3		A (0.41)	6		
	WB – LTR	A (0.45)	3	9	A (0.41)	5	17	~110
	NB – TL	C (0.05)	23	9	C (0.13)	25	18	~115
	SB – TR	B (0.05)	14	7	B (0.12)	15	14	~115
Cannon Street E/ Catharine Street N (signalized)	Overall	A (0.32)	3		A (0.28)	3		
	WB – LTR	A (0.32)	2	25	A (0.28)	2	21	~120
	SB – TR	C (0.16)	24	12	C (0.22)	24	15	~120
John Street N/ Robert Street (signalized for ped)	Overall	A (0.29)	9		A (0.28)	9		
	EB – LTR	A (0.04)	7	4	A (0.04)	7	5	~65
	WB – LTR	A (0.01)	9	2	A (0.02)	9	4	~75
	NB – LTR	A (0.29)	9	21	A (0.28)	9	22	~120
	SB – LTR	A (0.12)	8	10	A (0.15)	8	13	~60

The analysis indicates that under the existing conditions, all signalized and unsignalized intersections are currently operating at acceptable levels of service during the morning and afternoon peak periods. In fact, these intersections are only operating at 50% capacity, therefore, there are still ample of capacity to accommodate future developments in the area. No physical improvements or signal timing optimizations are required at this time. The estimated queues are expected to be accommodated by the existing available storage length at these intersections. This is consistent with the site observations and traffic cameras.

3.0 TRANSPORTATION AND LAND USE PLANNING CONTEXT

3.1. Existing Land use

Based on Nextrans comprehensive review of the study area, it is evident that there is a wide range of different types of land uses and housing types currently exist in the Downtown area such as residential (including rental) and retail/commercial (banks, grocery stores, restaurants, medical/professional offices, government offices) along public streets. As the proposed development consists of one 12-storey high-rise building with a total of 128 residential dwelling units, this is compatible and consistent with the growing trend and intensification in the Downtown area to provide additional housing supply to the best area that currently serviced by existing and future public transit. The proposed development represents good transportation planning and meets the sustainability objectives of the City's Official Plan policies.

3.2. Future Rapid Transit Corridor

It is NexTrans' understanding that the Province has cancelled the proposed Light Rail Transit (LRT) in 2019 due to project rising costs. However, in February, 2021, the Province has recommitted this project with some funding contribution from

various levels of government. Based on the information obtained from the Metrolinx website (www.metrolinx.com), the Hamilton LRT project will play a key role in the revitalization of Hamilton’s urban environment by transforming how residents travel across the heart of the city. Modern light rail service will connect key areas, destinations and institutions along Main Street, King Street and Queenston Road, creating a 14-kilometre multi-modal corridor and an enhanced streetscape. Our assessment analysis indicate that the proposed development is located in the heart of Downtown Hamilton and has one of the best locations for use of existing and future public transit. The proposed land uses also support future transit ridership and help reduce the numbers of single-occupant-vehicles to and from the proposed development.

4.0 FUTURE BACKGROUND CONDITIONS

4.1. Analysis Horizon

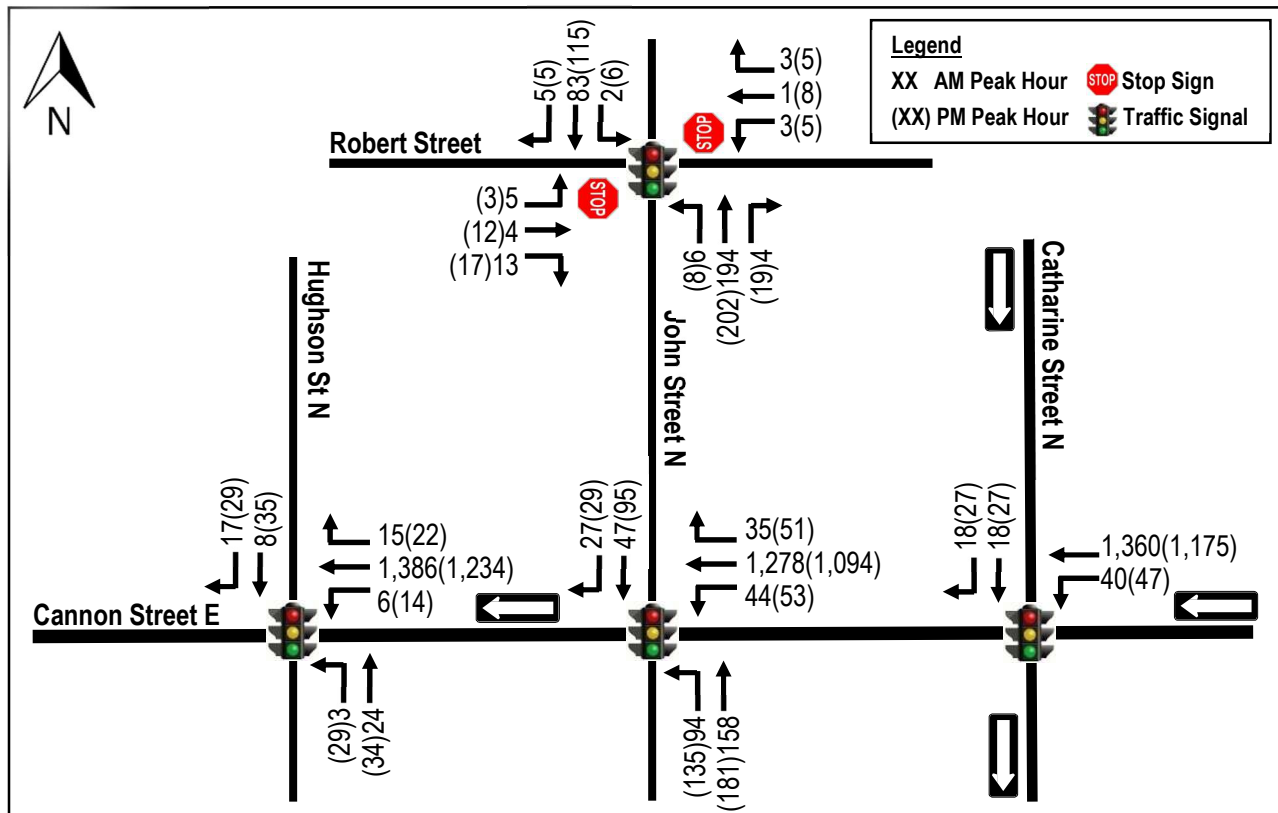
For the purposes of this assessment, it is assumed that the proposed development will be fully built-out by 2025. therefore, the 2030 horizon will be carried out for the study analysis. This is consistent with the City of Hamilton Traffic Impact Study Guidelines.

4.2. Future Background Corridor Growth

Based on Nextrans’ consultation with the City staff on other projects in the area and in the City of Hamilton, it is indicated that the City of Hamilton assumes 1% for through background traffic growth per annum (compounded) for the main streets in the study area.

For the purposes of this assessment, a 1% percent traffic growth per annum (compounded) has been applied to all the existing traffic turning movement counts at the intersections considered in the analysis. This is equivalent to a total growth of approximately 8% or more for 8 years (from 2022 to 2030). **Figure 7** illustrates the future background corridor growth.

Figure 7 – 2030 Background Corridor Growth Traffic Volumes



4.3. Background Development Applications

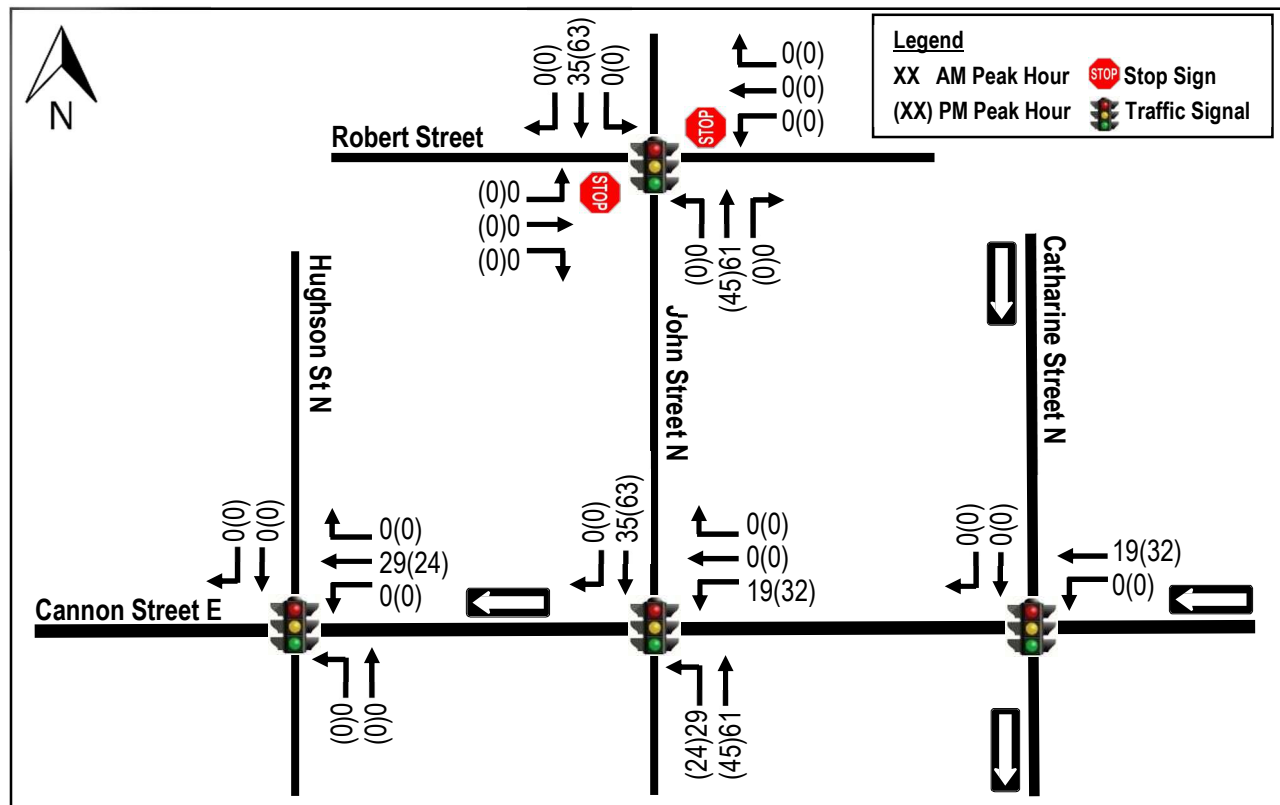
A comprehensive review of the active developments located within the study area was conducted based on the information extracted from the City of Hamilton development application portal (<https://www.hamilton.ca/development/planning-applications/development-applications-mapping>). This review indicates that there are a few active development applications in the area such as:

- 41 Wilson Street – proposed three 30-storey mixed-use building with a total of 908 dwelling units
- 80 John Street North - proposed two 30-storey mixed-use towers with 700 units
- 71 Rebecca Street - proposed 30-storey mixed-use building with 477 residential units

For the purposes of this assessment, the proposed background developments site trip generations were estimated using the Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition. Land Use Code 222 “Multifamily Housing High-Rise” fitted curve equations were utilized. The detailed calculations are outlined in **Appendix C**. The trip distribution and trip assignment are based on the existing turning movement counts and/or 2016 Transportation Tomorrow Survey data outlined in **Appendix E**, where appropriate.

It is anticipated that the 1% background compounded growth rate (or total of 8%) would capture all trips from other minor background development applications.

Figure 8 – Background Development Traffic Volumes



4.4. Future Background Traffic Assessment

The future background traffic volumes illustrated in **Figure 9** (existing traffic volumes plus background corridor growth and background development traffic volumes) were analyzed using Synchro 11 Software and utilized the existing lane configurations. The detailed calculations are provided in **Appendix D** and summarized in **Table 4**.

Figure 9 – 2030 Future Background Traffic Volumes

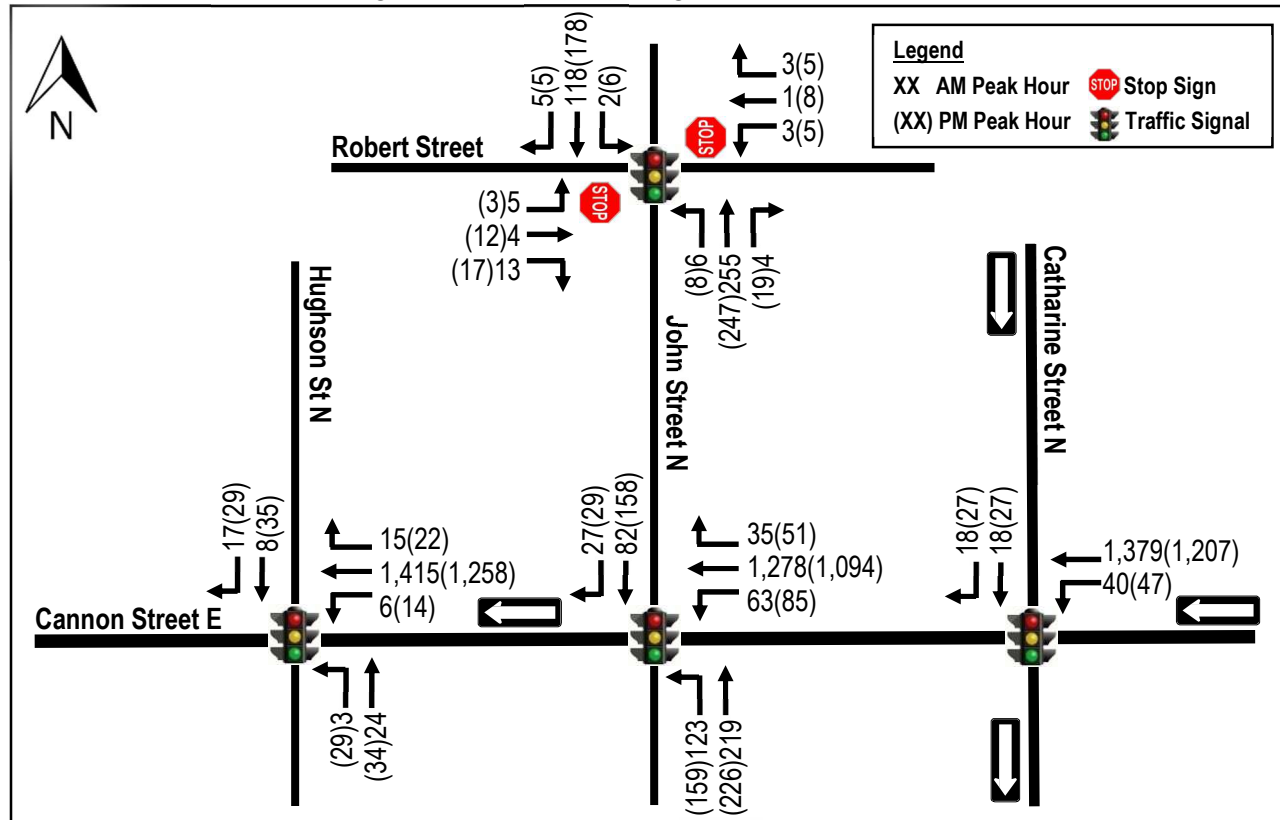


Table 4 – 2030 Future Background Levels of Service

Intersection	Key Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage (m)
		LOS (v/c)	Delay (s)	95 th Queue(m)	LOS (v/c)	Delay (s)	95 th Queue(m)	
Cannon Street E/ John Street N (signalized)	Overall	B (0.54)	15		B (0.54)	15		
	WB – LTR	B (0.54)	12	71	A (0.42)	8	51	~115
	NB – L	C (0.29)	24	31	C (0.54)	35	46	~85
	NB – T	C (0.40)	25	52	C (0.46)	30	57	~85
Cannon Street E/ Hughson Street N (signalized))	SB – TR	B (0.19)	18	24	C (0.36)	26	45	~60
	Overall	A (0.50)	4		A (0.46)	7		
	WB – LTR	A (0.50)	3	13	A (0.46)	5	20	~110
Cannon Street E/ Catharine Street N (signalized)	NB – TL	C (0.05)	23	10	C (0.14)	25	19	~115
	SB – TR	B (0.06)	14	7	B (0.13)	15	15	~115
	Overall	A (0.35)	3		A (0.32)	4		
John Street N/ Robert Street (signalized for ped)	WB – LTR	A (0.35)	2	28	A (0.32)	3	24	~120
	SB – TR	C (0.17)	24	12	C (0.24)	24	16	~120
	Overall	B (0.44)	10		A (0.39)	10		
	EB – LTR	A (0.05)	7	4	A (0.06)	7	5	~65
	WB – LTR	A (0.02)	9	2	A (0.03)	9	4	~75
	NB – LTR	B (0.44)	11	29	B (0.39)	10	30	~120
	SB – LTR	A (0.19)	8	14	A (0.25)	9	20	~60

The analysis indicates that under the future background conditions, all signalized and unsignalized intersections are expected to operate at acceptable levels of service during the morning and afternoon peak periods. Similar to the existing conditions, these intersections are only expected to operate slightly over 50% of the intersection capacity, therefore, there are expected ample of capacity to accommodate future developments in the area. No physical improvements or signal timing optimizations are required under this horizon year.

The forecast queues are expected to be accommodated by the existing available storage length at these intersections.

5.0 PROPOSED DEVELOPMENT ASSESSMENT

5.1. Proposed Development

The subject site is currently occupied by one and two-storey building (Italian Bakery) and a surface parking lot. The proposed development consists of one 12-storey high-rise building with a total of 128 residential dwelling units.

5.2. Trip Generation and Trip Distribution Methodology

The *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers (ITE) will be utilized to estimate the site trip generation for the proposed development. It is anticipated that with the completion of the 14-km LRT through the Downtown, the traffic pattern of the City will be much different from today as some of the auto capacity on King Street will be reduced and diverted to other corridors. However, in the mean time, more drivers will be taking transit instead of driving due to gas costs, automobile costs and potentially parking costs. In a long-term the overall auto traffic to and from the Downtown area will be reduced. As the 2016 TTS data may not be applicable for the trip distribution for this area due to future LRT, Nextrans will utilize the existing traffic distribution using the existing traffic turning movement counts at the John Street N/Cannon Street E and John Street N/Robert Street intersections.

5.3. Site Trip Generation

As indicated above, the trip generation forecasts were undertaken using the information contained in the *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers (ITE). To be conservative, the ITE Land Use Codes (LUC) 222 “Multifamily Housing High-Rise Not Close to Rail Transit” fitted curve equations has been utilized for the proposed development. It should be noted that the proposed development is only located 650 m from the future LRT on King Street, or less than 10-minute walk. As per Metrolinx requirement and definition, rapid transit catchment is typically 800m radius, therefore, the proposed development located well within this radius. Therefore, this assessment is conservative. **Table 5** summarizes the proposed development site trip generation based on the methodologies noted above.

Table 5 – Site Traffic Trip Generation

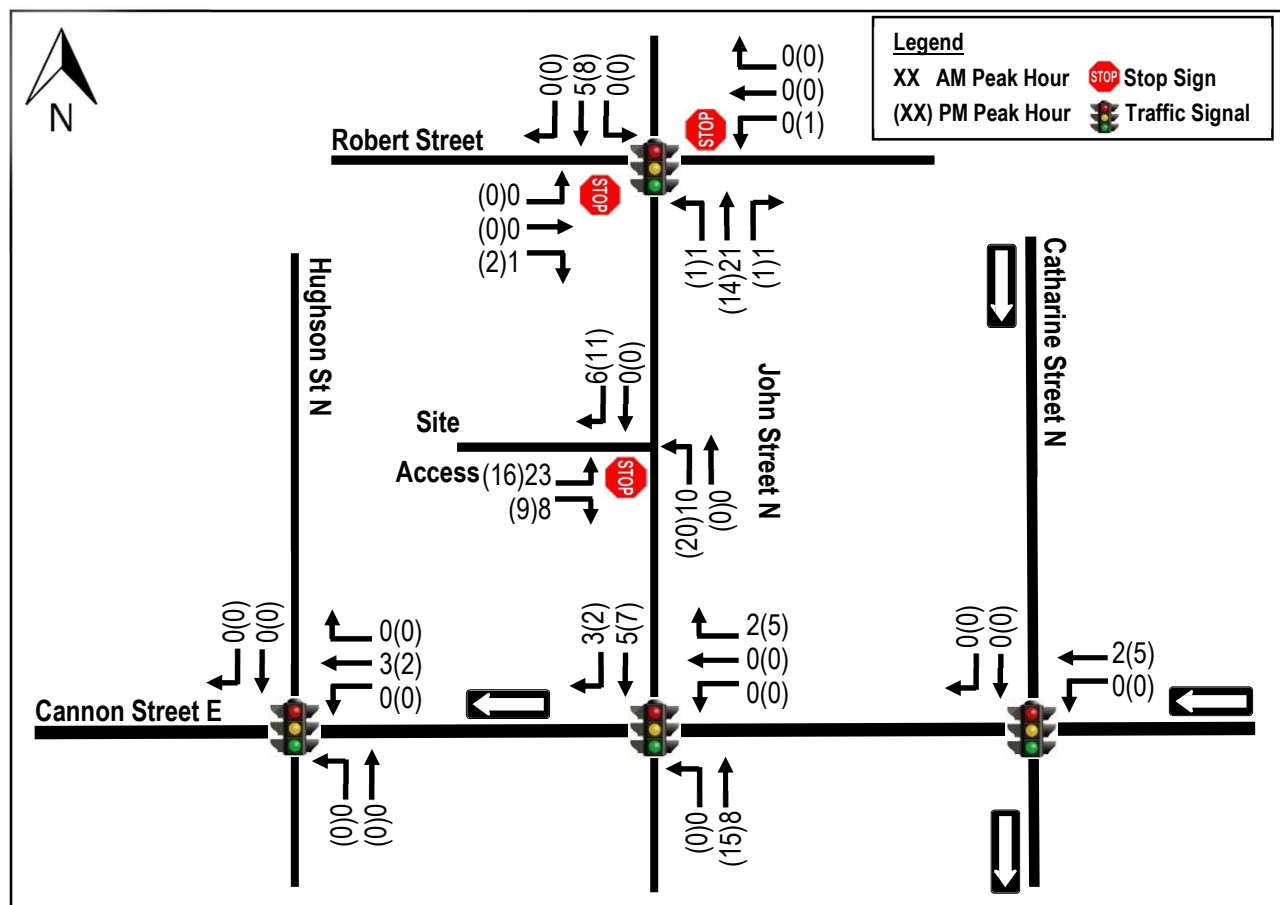
ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Not Close to Rail Transit	128	Vehicle Trips Trip Rates AM - T = 0.22*(X) + 18.85 PM - T = 0.26*(X) + 23.12	0.13	0.24	0.37	0.25	0.19	0.44
			New Auto Trips	16	31	47	31	25	56
		Transit Trips Trip Rates (use average as no equations were given)	0.08	0.07	0.15	0.04	0.03	0.07
			New Transit Trips	10	9	19	5	4	9
		Walk Trips Trip Rates (use average as no equations were given)	0.11	0.14	0.25	0.12	0.15	0.27
			New Walk Trips	14	18	32	15	20	35
Total New Person Trips			40	58	98	51	49	100

The proposed development is expected to generate:

- 19 total two-way transit trips (10 inbound and 9 outbound) during the weekday morning peak hour and 9 total two-way transit trips (5 inbound and 4 outbound) during the afternoon peak hour;
- 32 total two-way walk trips (14 inbound and 18 outbound) during the weekday morning peak hour and 35 total two-way walk trips (15 inbound and 20 outbound) during the afternoon peak hour; and
- 47 total two-way auto trips (16 inbound and 31 outbound) during the weekday morning peak hour and 56 total two-way auto trips (31 inbound and 25 outbound) during the afternoon peak hour

Figure 10 illustrates the site trip assignment, based on the existing turning movement percentages outlined in Appendix E.

Figure 10 – Site Traffic Volumes



6.0 FUTURE TOTAL CONDITIONS

6.1. Future Total Traffic Assessment for Auto Mode

The estimated future total traffic volumes (future background traffic volumes plus site generated traffic volumes) are illustrated in Figure 11 and analyzed using Synchro 11 software. The detailed calculations are provided in Appendix F and summarized in Table 6.

The analysis indicates that under the future total conditions, similar to the existing and future background conditions, all signalized and unsignalized intersections are expected to operate at acceptable levels of service during the morning and afternoon peak periods. Similar to the existing conditions, these intersections are only expected to operate slightly over 50% of the intersection capacity, therefore, there are expected ample of capacity to accommodate future developments in the area. No physical improvements or signal timing optimizations are required under this horizon year.

The forecast queues are expected to be accommodated by the existing available storage length at these intersections.

The analysis also indicates that the proposed development access is expected to operate at acceptable levels of service with minimum or negligible queues. In addition, there is no queue expected on the northbound direction on John Street N at the proposed site access. Therefore, no exclusive left turn lane is required for the proposed site access, similar to today conditions and along John Street N.

Figure 11 – 2030 Future Total Traffic Volumes

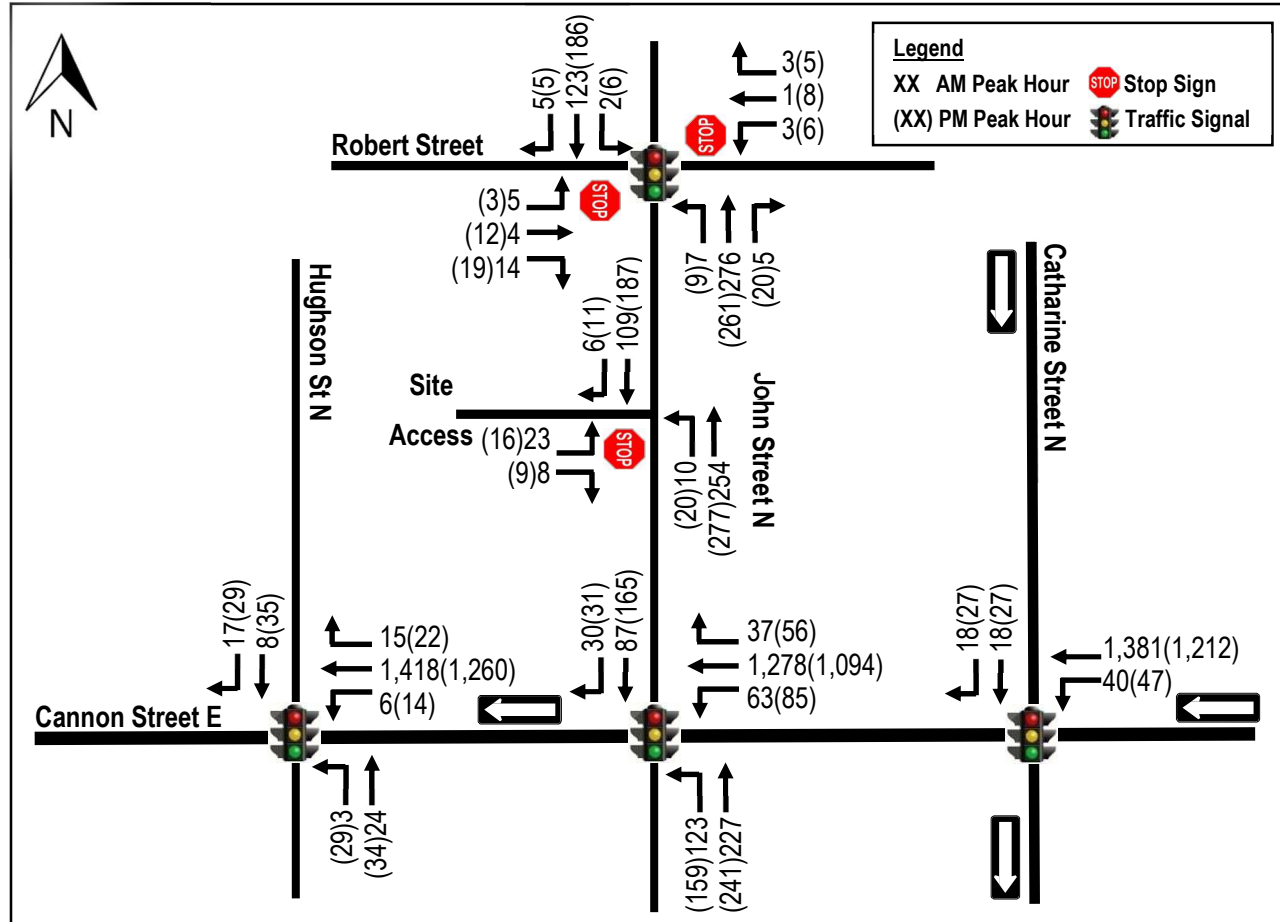


Table 6 – 2030 Future Total Levels of Service

Intersection	Key Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage (m)
		LOS (v/c)	Delay (s)	95 th Queue(m)	LOS (v/c)	Delay (s)	95 th Queue(m)	
Cannon Street E/ John Street N (signalized)	Overall	B (0.55)	15		B (0.56)	15		
	WB – LTR	B (0.55)	12	71	A (0.43)	8	51	~115
	NB – L	C (0.29)	24	32	D (0.56)	35	47	~85
	NB – T	C (0.41)	25	54	C (0.49)	30	61	~85
	SB – TR	B (0.21)	18	26	C (0.37)	26	47	~60
Cannon Street E/ Hughson Street N (signalized)	Overall	A (0.50)	4		A (0.46)	7		
	WB – LTR	A (0.50)	3	13	A (0.46)	5	20	~110
	NB – TL	C (0.05)	23	10	C (0.14)	25	19	~115
Cannon Street E/ Catharine Street N (signalized)	SB – TR	B (0.06)	14	7	B (0.13)	15	15	~115
	Overall	A (0.35)	3		A (0.32)	4		
John Street N/ Robert Street (signalized for ped)	WB – LTR	A (0.35)	2	28	A (0.32)	3	24	~120
	SB – TR	C (0.17)	24	12	C (0.24)	24	16	~120
	Overall	B (0.47)	10		A (0.41)	10		
	EB – LTR	A (0.05)	7	4	A (0.06)	7	5	~65
John Street N/ Site Access (unsignalized)	WB – LTR	A (0.02)	9	2	A (0.04)	9	4	~75
	NB – LTR	B (0.47)	12	32	B (0.41)	11	32	~120
	SB – LTR	A (0.20)	8	14	A (0.26)	9	21	~60
	EB – LR	B (0.06)	12	2	B (0.06)	13	1	~15
John Street N/ Site Access (unsignalized)	NB – TL	A (0.01)	0	0	A (0.02)	1	0	~60
	SB – TR	A (0.07)	0	0	A (0.13)	0	0	~120

6.2. Future Total Traffic Assessment for Transit Mode

As indicated in Section 5.3 of this Study, the proposed development is expected to generate 20 total two-way transit trips (10 inbound and 10 outbound) and 9 total two-way auto trips (5 inbound and 4 outbound) during the morning and afternoon peak hours, respectively.

As indicated in Section 2.3, the area is currently well serviced by the existing transit network. The proposed development has excellent access to the public transit because the proposed development is located:

- Less than 900 m (about 12 minute-walk) to Hamilton GO Centre, which includes GO Train and Bus services, as well as HSR Transit Bus Routes;
- About 900 m (about 12 minute-walk) to MacNab Transit Terminal; and
- Adjacent to Cannon Street and John Street transit stops

Based on the assessment in this Study, the proposed development site generated transit trips can be accommodated by the existing conventional transit alone without any improvements to the existing transit system.

It is NexTrans' understanding that the Province has cancelled the proposed Light Rail Transit (LRT) in 2019 due to project rising costs. However, in February, 2021, the Province has recommitted this project with some funding contribution from various levels of government. Based on the information obtained from the Metrolinx website (www.metrolinx.com), the Hamilton LRT project will play a key role in the revitalization of Hamilton's urban environment by transforming how residents travel across the heart of the city. Modern light rail service will connect key areas, destinations and institutions along Main Street, King Street and Queenston Road, creating a 14-kilometre multi-modal corridor and an enhanced streetscape.

It anticipated that the residents and employees from the proposed development will walk to the Downtown Hamilton Transit Terminal, MacNab Terminal or the future LRT along King Street, instead of taking any local transit routes or drive to the stations. Therefore, the proposed development is expected to have minimal or negligible impact on the existing and future transit system. The analysis indicates that the proposed development will contribute a healthy transit ridership for both the existing conventional HSR transit system and the LRT along King Street.

6.3. Future Active Transportation Mode Assessment

Walking Mode Assessment

The area is currently well serviced by a complete network of sidewalk. Sidewalks are available on both sides of all public streets in the study area such as John Street North, Cannon Street E, Catharine Street N and Hughson Street N. There are no missing gaps or links identified as per our observation and site visit. The sidewalks are generally in good condition and reasonably maintained on the public streets.

As part of the proposed development, the existing sidewalk on John Street North will be maintained and enhanced to provide good pedestrian experience. There will be sufficient lighting in along the frontage of the building that will provide security for pedestrians on John Street North.

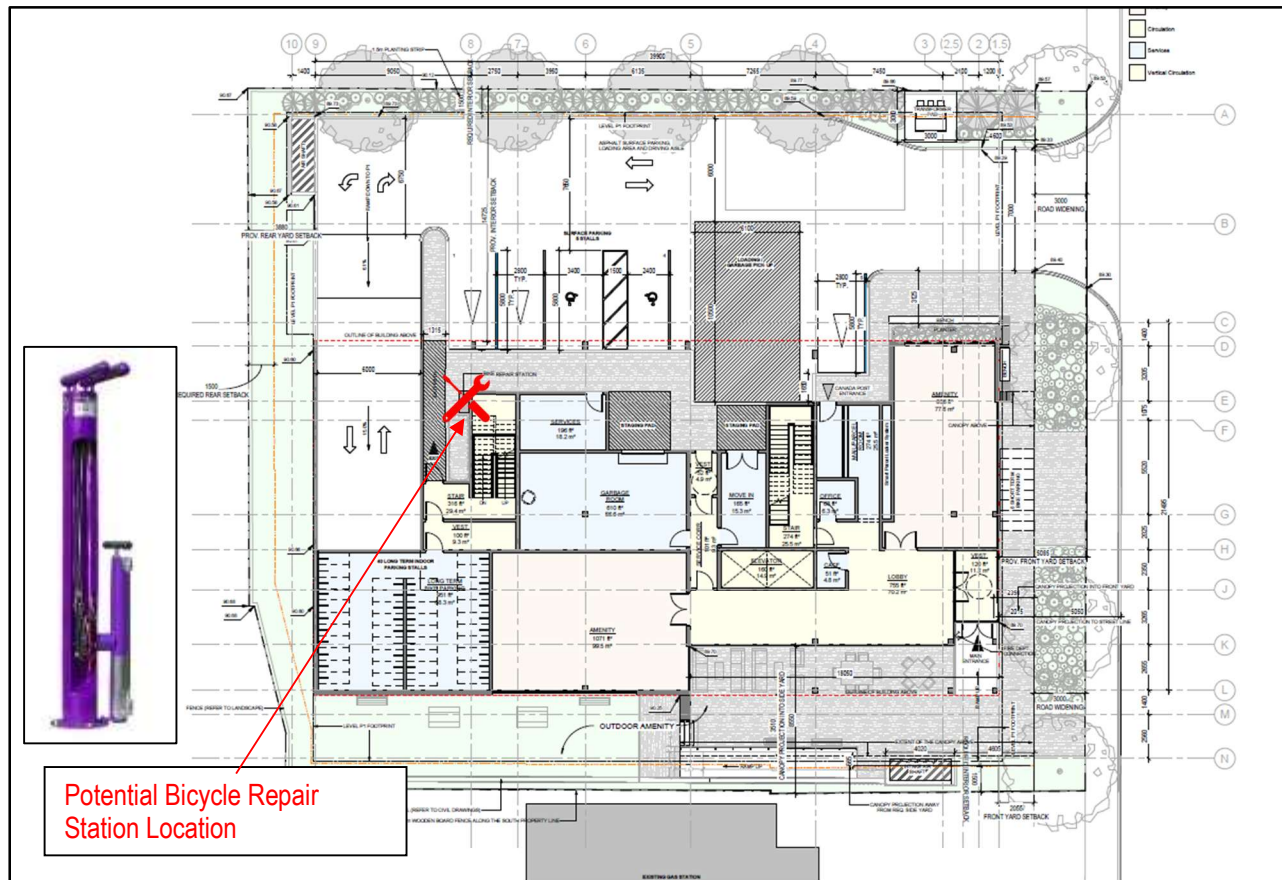
Cycling Mode Assessment

Under the existing conditions, there are dedicated bicycle facilities along the south side of Cannon Street E, on York Boulevard west of James Street N, west side of Bay Street N and Ferguson Avenue N available. NexTrans' review and assessment indicates that a better and more connected bicycle network along other east-west and north-south streets should be implemented as part of future City's capital projects. A complete bicycle network will help increase cycling trips and reduce the numbers of single-occupant-vehicle trips to and from the area.

As part of the proposed development, a total of 102 bicycle parking spaces will be provided to encourage residents to use active and more sustainable mode of transportation instead of driving private vehicles to and from the proposed development.

NexTrans also recommends that the proposed development provide one bicycle repair station on-site at a convenient location, such as close to the building entrance or within the bicycle parking locker area. The final location will be determined through the subsequent stage of the proposed development.

Figure 12 – Potential Location of Bicycle Repair Station



7.0 SITE PLAN REVIEW

7.1. Loading Requirement

The proposed development provides one on-site loading spaces for servicing vehicles (garbage and delivery trucks) to service the proposed building.

7.2. Vehicle Movement Diagrams

The detailed AutoTURN analysis has been provided to demonstrates the maneuverability of the largest servicing vehicles that will service the proposed development, as well as the passenger car maneuverability within the proposed underground parking. **Figures 13 to 16** illustrate the vehicle turning movements for various vehicle types.

7.3. Proposed Development Access Assessment

Under the existing conditions, the subject site has two accesses onto John Street North that operates as a one-way

system, with the inbound traffic at the south access and outbound traffic at the north access due to the nature of the angled parking configurations. In the future with the redevelopment of the site, only one full moves access will be provided onto John Street North at the northerly limit of the site to service the proposed development. This access arrangement will reduce and eliminate conflict points for pedestrians, cyclist and vehicles along John Street N. The analysis indicates that the proposed development site access onto John Street North is expected to operate at acceptable levels of service with minimal queue or delay. No improvements such as exclusive turning lanes are required for the proposed site access. The proposed site access lane configurations include:

- One inbound lane and one outbound lane (with minimum width to reduce pedestrian crossing); and
- One southbound shared through/right lane and one northbound shared through/left lane

7.4. Traffic Calming

Given that John Street N only has a general two-lane cross-section and it has traffic signals at the Cannon Street E and pedestrian signals at Robert Street, traffic calming measures are not required on John Street N in the proximity of the proposed development under the horizon year considered in this Study Update (2030). On-street parking along with narrower lanes on John Street N are effective traffic calming measures for the context of the area. In the future, traffic calming assessment

8.0 PARKING ASSESSMENT

8.1. Zoning By-Law Vehicle Parking Requirement

As requested by the City staff, the current Zoning By-law No. 05-200 Section (although not yet fully in force) has been reviewed and applied in the analysis. The subject lands are located in the Parking Rate Area 1. **Table 7** summarizes the City’s Zoning By-law No. 05-200 vehicle parking requirements for the proposed development.

Table 7 – Zoning By-law No. 05-200 Parking Rate Area 1

Type	No. Unit	Minimum Parking Rates	Maximum Parking Rates	Minimum Spaces	Maximum Spaces
Residential	128 units	No minimum requirement	1.00 space/unit (inclusive of resident and visitor)	0 spaces	128 spaces
Visitor	128 units	2 spaces + 0.05 spaces/unit		9 spaces	
Total Parking Spaces Required				9 spaces	128 spaces

Based on the City’s By-Law No. 05-200, a minimum of 9 and a maximum of 128 vehicle parking spaces are required for the proposed development. Based on the recommendations of this Study Update and comprehensive justifications provided, the proposed development only needs to provide a total of 42 vehicle parking spaces, which exceeds the minimum Zoning By-law requirement and represents a reduction of 67% vehicle parking spaces from the maximum allowable in the Zoning By-law. Our analysis indicates that this recommended reduction is required and necessary to support TDM, as noted in Section 9 of this Study Update.

8.2. Recommended Vehicle Parking Requirement

Based on the comprehensive justifications provided in the subsequent sections of this Study, as well as to support and to support TDM measures, the recommended vehicle parking rates are provided below (**Table 8**).

Table 8 – Recommended Vehicle Parking Requirements

Type	No. Unit	Ratio	Required
Residential parking requirement	128 units	0.25 spaces/unit	32 spaces
Visitor parking requirement	128 units	2 + 0.05 spaces/unit	9 spaces
Total Parking Spaces Required			41 spaces

Therefore, our analysis indicates that the proposed development only needs to provide a total of 41 vehicle parking spaces, including 9 visitor and 32 residential parking spaces. The proposed development will meet or exceed this requirement by providing 42 vehicle parking spaces.

The vehicle parking justifications are provided below.

8.3. Vehicle Parking Justifications

8.3.1. Proposed Development Strategic Location

As indicated, the proposed development is located within the City’s Downtown area, within short walking distance to many existing amenities, employment and professional offices. The proposed development has excellent access to the public transit, as the proposed development is located:

- Less than 900 m (about 12 minute-walk) to Hamilton GO Centre, which includes GO Train and Bus services, as well as HSR Transit Bus Routes;
- About 900 m (about 12 minute-walk) to MacNab Transit Terminal; and
- Adjacent to Cannon Street and John Street transit stops

Based on Nextrans comprehensive review of the study area, it is evident that there is a wide range of different types of land uses and housing types currently exist in the Downtown area such as residential (including rental) and retail/commercial (banks, grocery stores, restaurants, medical/professional offices, government offices) along public streets. As the proposed development consists of one 12-storey high-rise building with a total of 128 residential dwelling units, this is compatible and consistent with the growing trend and intensification in the Downtown area to provide additional housing supply to the best area that currently serviced by existing and future public transit. The proposed development represents good transportation planning and meets the sustainability objectives of the City’s Official Plan policies.

8.3.2. Other Transportation Options

Besides excellent existing transit services, the area is currently well serviced by a complete network of sidewalk. Sidewalks are available on both sides of all public streets in the study area. There are no missing gaps or links identified as per our observation and site visit. There are dedicated bicycle facilities along the south side of Cannon Street E, on York Boulevard west of James Street N, west side of Bay Street N and Ferguson Avenue N available.

8.3.3. Existing Modal Share

Table 9 summarizes the travel mode split information based on the review of the 2016 Transportation Tomorrow Survey data for the downtown area traffic zones. The detail data extraction is included in **Appendix E**.

Table 9 – Modes of Travel based on 2016 TTS for Downtown Traffic Zones

Land Use	Time	Auto Driver	Auto Passenger	Local Transit	GO Transit	Cycle	Walk
Residential	AM Peak Period (6:00 – 9:00 AM)	55%	6%	25%	6%	0%	8%
	PM Peak Period (3:00 – 6:00 PM)	35%	5%	32%	3%	5%	20%

As expected, there is a high percentage of transit and active transportation usage in the Downtown area under the existing conditions, with 39% during the morning and 60% during afternoon peak period for residential land use. It is expected that with the Future Rapid Transit project to be implemented, the modal split will be much higher.

As the recommended vehicle parking reduction is only 65%, based on the existing modal split alone, this recommendation is justified and reasonable given that the existing afternoon peak period modal split is already at 60%. In order to meet the City’s sustainability objectives, the usage of single-occupant-vehicle should be discouraged in the Downtown area through Transportation Demand Management, parking management and other incentives and measures.

8.3.4. Walk Score

Nextrans has reviewed the walk score for the subject site using the information in www.walkscore.com website. **Table 10** below summarizes the walk score for the subject site.

Table 10 – Walk Score for 175 John Street North, Hamilton

Mode	Score	Description
Walking	99	Walker's Paradise – Daily errands do not require a car
Public Transit	83	Excellent Transit – Transit is convenient for most trips
Cycling	93	Biker's Paradise – Daily errands can be accomplished on a bike

As indicated in the table above, the area has excellent multimodal transportation such as walking, cycling and transit. Daily errands do not require a car. For these reasons, vehicle parking should be reduced and discourage in order to continue this excellent trend.

8.3.5. Increase the Housing Supply in the City of Hamilton

The City of Hamilton is currently facing a housing supply shortage, similar to other jurisdictions in the Province of Ontario. One of the reasons for housing affordability is the parking requirement for the proposed development. The cost of providing one parking space could be in the range of \$100,000 per space or more due to the land costs, constructability, site constraints and other factors. Therefore, the more residential or visitor parking spaces that a proposed development has to provide, the more expensive the maintenance costs will be for the owners. Monthly maintenance cost for a parking space could be up to \$100 per month, on top of the capital costs of a parking space. This means that the less parking is provided, the less condo fees the owners will have to carry monthly. Given that the proposed development is well-served by existing active transportation and transit network, these transportation options are much more cost effective and sustainable compared to driving private vehicles. Therefore, based on this reason alone, the number of parking space requirements should be reduced for any new development in the City of Hamilton, especially, for the proposed developments that are located close to the higher order transit corridors and stations, like the subject development which is located within walking distance to the transit stations and future LRT line.

8.3.6. Neighbourhood Context

Based on Nextrans comprehensive review of the study area, it is evident that there is a wide range of different types of land uses and housing types currently exist in the Downtown area such as residential (including rental) and retail/commercial (banks, grocery stores, restaurants, medical/professional offices, government offices) along public streets. As the proposed development consists of one 12-storey high-rise building with a total of 128 residential dwelling units, this is compatible and consistent with the growing trend and intensification in the Downtown area to provide additional housing supply to the best area that currently serviced by existing and future public transit. The proposed development represents good transportation planning and meets the sustainability objectives of the City's Official Plan policies.

8.3.7. Benefits of Vehicle Parking Reduction

Based on the assessment noted above, there are many potential benefits of vehicle parking reduction, such as:

- Making housing more affordable by reducing construction costs for development projects;
- Vehicle parking reduction is the best TDM initiative and measure that discourage residents from owning a private vehicle;
- Support transit and active transportation usage;
- Reduce traffic congestions and air pollution by reducing the numbers of single-occupant-vehicle trips to and from the proposed development; and
- Support the sustainability objectives and requirements of the City's Official Plan

9.0 BICYCLE PARKING

As requested by the City staff, the current Zoning By-law No. 05-200 (although not yet fully in force) has been reviewed and applied in the analysis for the bicycle parking requirement. The subject lands are located in the bicycle Parking Rate Area 1. **Table 7** summarizes the City’s Zoning By-law No. 05-200 bicycle parking requirements for the proposed development.

Table 11 – Zoning By-law No. 05-200 Bicycle Parking Requirement

Land Use	No. of Unit/GFA	Short-Term Spaces	Long-Term Spaces	Total
Residential	128 units	0.10 spaces/dwelling unit	0.70 spaces	102 spaces
		13 spaces	89 spaces	

Based on the current Zoning By-law requirement, the proposed development requires a total of 102 bicycle parking spaces (13 short-term and 89 long-term). The proposed development will provide a total of 89 long-term and 13 short-term spaces, for a total of 102 bicycle parking spaces. This meets the Zoning By-law requirement and this provision will encourage future residents to use active mode of transportation to and from the proposed development. This provision will also support the recommended vehicle parking reduction noted above.

10.0 TRANSPORTATION DEMAND MANAGEMENT (TDM) OPTIONS

10.1. City of Hamilton’s TDM for Development (June, 2015)

The City of Hamilton’s TDM for Development Report (June, 2015) has been reviewed and consulted to prepare the TDM plan for the proposed development. It should be noted that the City has indicated in the terms of reference that a comprehensive TDM is not required to be included in this Study. For this reason, Nextrans only provides a high level TDM plan to support the proposed development, where appropriate. It should be noted that Transportation Demand Management (TDM) is a coordinated series of actions aimed at maximizing the people moving capability of the transportation system. According to the City’s TDM Report, the main objectives of TDM are:

- Shifting travel modes (e.g. walking, cycling, taking transit or carpooling instead of driving alone);
- Reducing the number of trips people must make (e.g. destinations and activities such as work and shopping, near each other); and,
- Travelling more efficiently (e.g. making trips outside of peak hours).

Potential TDM measures may include but not limited to: TDM supportive land use, bicycle and pedestrian programs and facilities, public transit improvements, preferential treatments for buses and high occupancy vehicles (if applicable), ridesharing, and employee incentives (for employment related land uses).

10.1.1. Increase Density and Compact Site Design

The subject site is currently occupied by one and two-storey building (Italian Bakery) and a surface parking lot. The proposed development consists of one 12-storey high-rise building with a total of 128 residential dwelling units.

10.1.2. Site Design Elements

It is Nextrans’ understanding that the proposed development has been designed to include the following design elements:

- The proposed development access will meet the City’s minimum width requirement with continuous sidewalks
- Direct pedestrian access to John Street N (i.e. a building entrance will be provided onto John Street N), where appropriate

NexTrans' review and analysis indicate that these compact design elements will help facilitate the pedestrian and cyclist movements in efficient and safe manner.

10.1.3. Sidewalks and Pathways

The proposed development will maintain continuous sidewalks along John Street N, as illustrated in **Figure 2**. The proposed development also provides direct building access onto John Street N, where appropriate.

10.1.4. Bicycle Parking (Long-term and Short-term)

Based on the current Zoning By-law requirement, the proposed development requires a total of 102 bicycle parking spaces (13 short-term and 89 long-term). The proposed development will provide a total of 89 long-term and 13 short-term spaces, for a total of 102 bicycle parking spaces. This meets the Zoning By-law requirement and this provision will encourage future residents to use active mode of transportation to and from the proposed development. This provision will also support the recommended vehicle parking reduction noted above.

10.1.5. Direct Connections to Transit

As indicated in Section 2.3, the area is currently well serviced by the existing transit network. The proposed development has excellent access to the public transit because the proposed development is located:

- Less than 900 m (about 12 minute-walk) to Hamilton GO Centre, which includes GO Train and Bus services, as well as HSR Transit Bus Routes;
- About 900 m (about 12 minute-walk) to MacNab Transit Terminal; and
- Adjacent to Cannon Street and John Street transit stops

It anticipated that the residents and employees from the proposed development will walk to the Downtown Hamilton Transit Terminal, MacNab Terminal or the future LRT along King Street, instead of taking any local transit routes or drive to the stations. Therefore, the proposed development is expected to have minimal or negligible impact on the existing and future transit system. The analysis indicates that the proposed development will contribute a healthy transit ridership for both the existing conventional HSR transit system and the LRT along King Street.

10.1.6. Opportunities for Reduced Parking Requirements

Based on the City's By-Law No. 05-200, a minimum of 9 and a maximum of 128 vehicle parking spaces are required for the proposed development. Based on the recommendations of this Study Update and comprehensive justifications provided, the proposed development only needs to provide a total of 42 vehicle parking spaces (including 9 visitor and 33 resident spaces), which exceeds the minimum Zoning By-law requirement and represents a reduction of 67% vehicle parking spaces from the maximum allowable in the Zoning By-law. Our analysis indicates that this recommended reduction is required and necessary to support TDM, as noted in Section 9 of this Study Update.

10.1.7. Unbundle Parking

As parking management is the best TDM incentive for resident to take alternative mode of transportation, it is recommended that the proposed development unbundle the parking sale from the unit.

10.1.8. On-Site Carshare Vehicle(s) and Parking Spot(s)

Based on NexTrans' review of the context of the City's TDM Guidelines, this provision is not required for the proposed development given the scale and location.

10.1.9. On-Site Bikeshare

Based on NexTrans' review of the context of the City's TDM Guidelines, a bikeshare station such as Hamilton SOBI should be located at a more publicly accessible locations and main intersections/attractions. As such, it is not appropriate to provide a bikeshare station in private property.

10.1.10. Wayfinding Signage

Given the proposed development is located in the Downtown Hamilton area, wayfinding signage is not required for the proposed development.

10.1.11. Travel Planning Tools and Support for Development of a School Travel Plan

It is recommended that the proposed development contact and coordinate with the Hamilton-Wentworth District School Board for any potential school travel plan in the area.

10.1.12. Opportunities for Transit Passes, Carshare Memberships, or Bikeshare Memberships

Given the strategic location of the proposed development that is close proximity to existing and future LRT transit, these incentives and measures are not required. It was indicated in the terms of reference that TDM is not required to be included in this Study.

10.1.13. Proposed Monitoring Evaluation of TDM Measures

Based on Nextrans' previous experience, monitoring and evaluation of TDM measures are important but very onerous for the Applicant. When project is completed and the Applicant transfers the ownership to Condominium Board, the Board will have full control of the proposed development and there are certain conditions and requirements that the Condominium Board may not agree with.

Therefore, our assessment indicates that TDM monitoring for the proposed development is not appropriate.

10.2. Recommended TDM Measures and Incentives for the Proposed Development

Based on the review of the proposed development context in relation to the TDM requirements by the City of Hamilton and TDM review outlined in Section 9.1 of this Addendum Report, the following TDM measures and incentives are recommended for the proposed development to consider:

- Maintain and enhance existing sidewalk along John Street N. The access should be well-lid and designed to accommodate high volumes of pedestrians;
- Provide direct shared pedestrian and cycling connections from the proposed development to John Street N, where appropriate;
- Provide an information package in form of a letter or email for each residential unit, that include HSR Transit System schedules, GO Transit schedules, cycling maps and community maps, where appropriate

Table 9 summarizes the recommended TDM measures and incentives.

Table 12 – Recommended TDM Measures for the Proposed Development

Category	TDM Initiative required by the City or suggested by Nextrans	Recommended Actions	Responsibility
Cycling	<ul style="list-style-type: none"> Visible, well-lit, short-term bicycle parking for visitors (above minimum provisions or recommendations) Secure, indoor bicycle parking storage spaces for tenants/residents Ensure development connects to bicycle network 	<ul style="list-style-type: none"> Provide 102 bicycle parking spaces as part of the development Provide one bicycle repair station on-site a convenient location 	Applicant
Walking	<ul style="list-style-type: none"> Safe, attractive and direct walkways for pedestrians linking building entrances with public sidewalks and with key destinations such as schools Enhanced pedestrian amenities on-site (benches, landscaping, lighting) 	<ul style="list-style-type: none"> Provide direct shared pedestrian and cycling connections from the proposed development to John Street N, where appropriate 	Applicant
Parking	<ul style="list-style-type: none"> Reduced minimum parking requirements based on proximity to transit Shared parking with nearby developments or on-street spaces Unbundle parking costs from unit costs 	<ul style="list-style-type: none"> Unbundle parking with the sale of the unit Reduce vehicle parking supply for the site based on the recommendation of this Study (42 spaces total instead of maximum 128 spaces) 	Applicant
Information Brochure/ Letter	<ul style="list-style-type: none"> Provide an information brochure/letter for each residential units that include HSR Transit System schedules, GO Transit schedules, cycling maps and community maps. 	<ul style="list-style-type: none"> Provide a brochure (letter or email) to new residents that include all website links to HSR Transit System and future LRT schedules, community maps and cycling maps 	Applicant

11.0 CONCLUSIONS / RECOMMENDATIONS

11.1. Study Conclusions

The findings and conclusions of the analysis are as follows:

- Under the existing conditions, the Downtown area is currently well serviced by the existing transit network. The proposed development has excellent access to the existing public transit service as it is located within walking distance to the existing bus stops on Cannon Street E and John Street N, McNab Transit Terminal, as well as the Hamilton GO Centre.
- The proposed development is expected to generate:
 - 19 total two-way transit trips (10 inbound and 9 outbound) during the weekday morning peak hour and 9 total two-way transit trips (5 inbound and 4 outbound) during the afternoon peak hour;
 - 32 total two-way walk trips (14 inbound and 18 outbound) during the weekday morning peak hour and 35 total two-way walk trips (15 inbound and 20 outbound) during the afternoon peak hour; and
 - 47 total two-way auto trips (16 inbound and 31 outbound) during the weekday morning peak hour and 56 total two-way auto trips (31 inbound and 25 outbound) during the afternoon peak hour
- The analysis indicates that under the existing, future background and future total conditions, all signalized and unsignalized intersections are expected to operate at acceptable levels of service during the morning and afternoon peak periods. Similar to the existing conditions, these intersections are only expected to operate slightly over 50% of the intersection capacity, therefore, there are expected ample of capacity to accommodate future developments in the area. No physical improvements or signal timing optimizations are required under this horizon year. The forecast queues are expected to be accommodated by the existing available storage length at these intersections.

- Based on the assessment in this Study, the proposed development site generated transit trips can be accommodated by the existing conventional transit alone without any improvements to the existing transit system.
- The proposed development provides one full moves access will be provided onto John Street North approximately middle of the site to service the proposed development. This access arrangement will reduce and eliminate conflict points for pedestrians, cyclist and vehicles along John Street N.

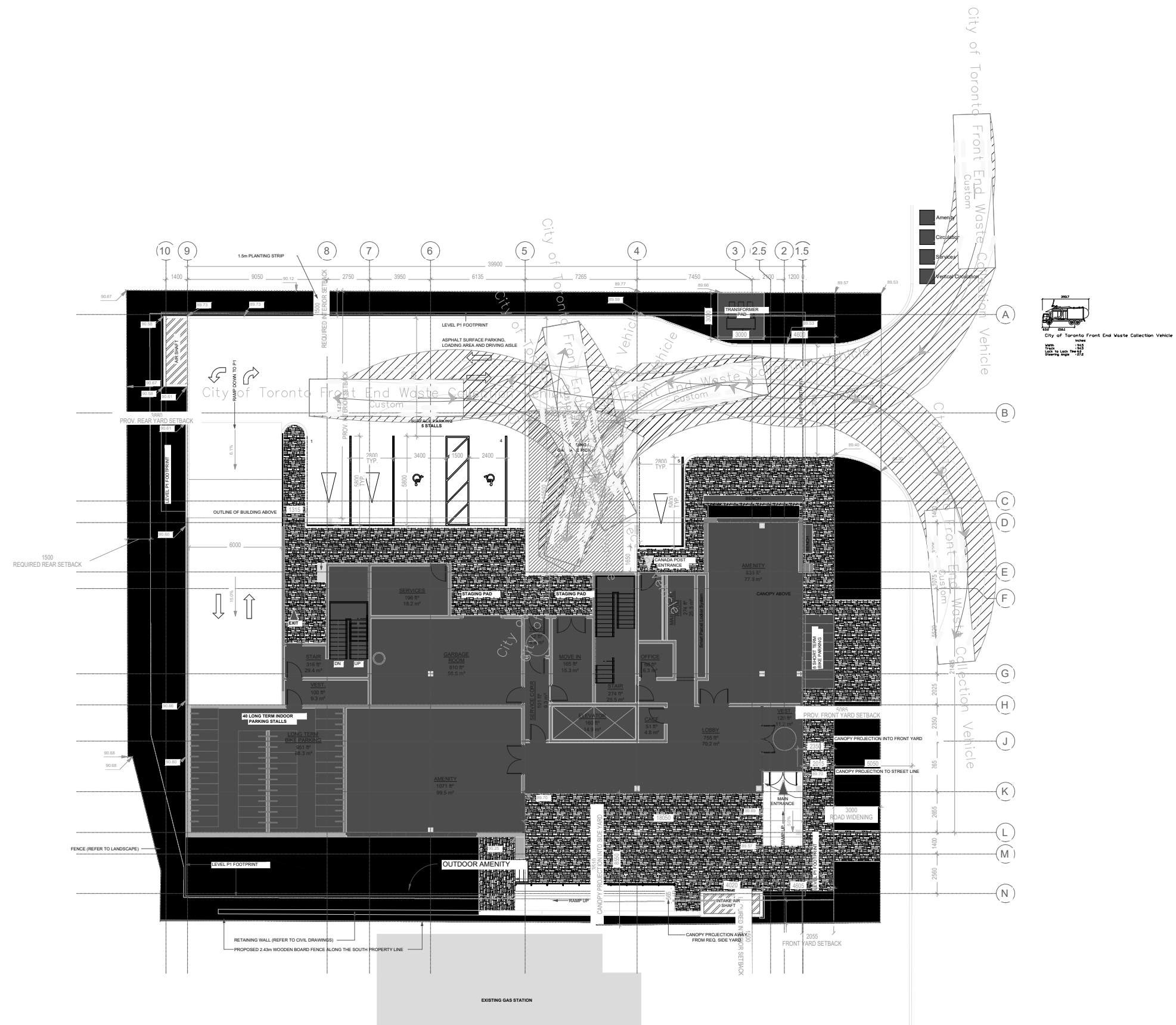
The analysis indicates that the proposed development site access onto John Street North is expected to operate at acceptable levels of service with minimal queue or delay. In addition, there is no queue expected on the northbound direction on John Street N at the proposed site access. Therefore, no exclusive left turn lane is required for the proposed site access, similar to today conditions and along John Street N.

- Based on the City's By-Law No. 05-200, a minimum of 9 and a maximum of 128 vehicle parking spaces are required for the proposed development. Based on the recommendations of this Study Update and comprehensive justifications provided, the proposed development only needs to provide a total of 42 vehicle parking spaces (including 9 visitor and 33 resident spaces), which exceeds the minimum Zoning By-law requirement and represents a reduction of 67% vehicle parking spaces from the maximum allowable in the Zoning By-law. Our analysis indicates that this recommended reduction is required and necessary to support TDM, as noted in Section 9 of this Study Update.
- Based on the current Zoning By-law requirement, the proposed development requires a total of 102 bicycle parking spaces (13 short-term and 89 long-term). The proposed development will provide a total of 89 long-term and 13 short-term spaces, for a total of 102 bicycle parking spaces. This meets the Zoning By-law requirement and this provision will encourage future residents to use active mode of transportation to and from the proposed development. This provision will also support the recommended vehicle parking reduction noted above.
- The proposed development provides one on-site loading spaces for servicing vehicles (garbage and delivery trucks) to service the proposed building. The detailed AutoTURN analysis has been provided to demonstrates the maneuverability of the largest servicing vehicles that will service the proposed development.

11.2. Study Recommendations

Based on the assessment and findings of this Study, the following recommendations are provided:

- The City approves the proposed development as the proposed development has minimum or negligible impacts on the existing transportation system;
- The proposed development provides minimum width for the proposed full moves access onto John Street N to minimize crossing distance for pedestrians and cyclists;
- The proposed development provides sufficient lighting at the proposed access to enhance security for pedestrians and cyclists;
- The proposed development only provides a total of 42 vehicle parking spaces instead of maximum allowable 128 vehicle parking spaces, as recommended in this Study;
- The proposed development provides 102 bicycle parking spaces;
- The proposed development provides one bicycle repair station on-site, at a convenient location;
- The proposed development implements the Transportation Demand Management (TDM) measures and incentives identified in Section 9 of this report to support active transportation and public transit, to meet the objectives and requirements by the City of Hamilton; and
- No physical improvements are required at the boundary intersections to accommodate the proposed development



BENCHMARK

REVISIONS

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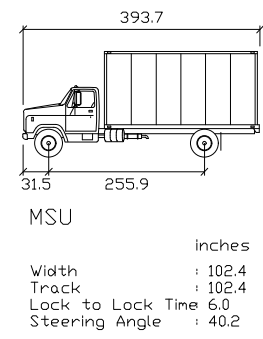
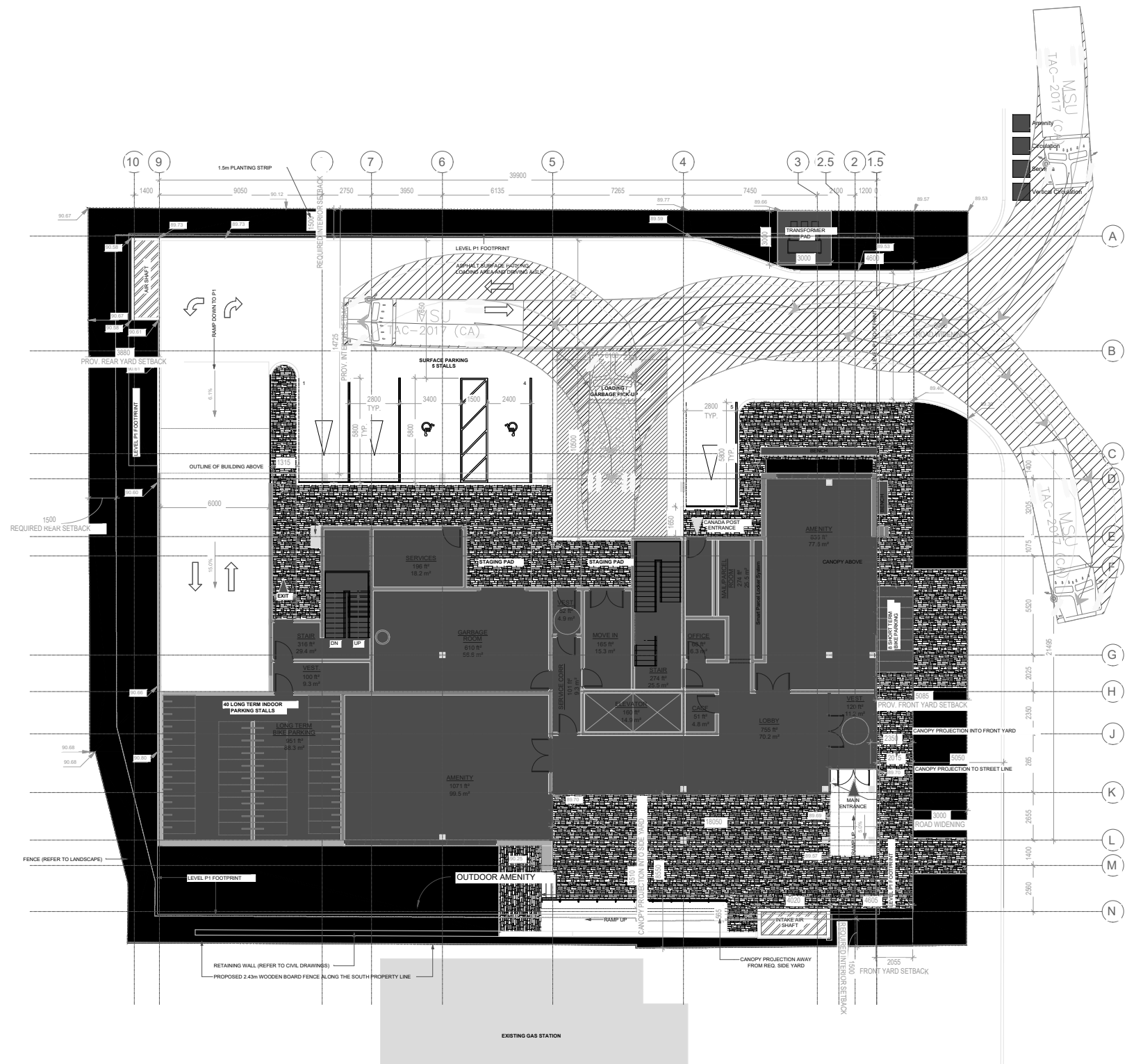
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Residential Development
175 John Street
City of Hamilton

DRAWING TITLE:

AutoTURN Analysis
Garbage Truck
Front End

DESIGN BY: K.A.	DATE: November 25, 2024
CHECKED BY: R.P.	PROJECT NO. NT-22-096
DRAWN BY: K.A.	DRAWING NO.
SCALE: NTS	Figure 14



KEY PLAN



BENCHMARK

REVISIONS

NO.	REVISION	DATE	BY

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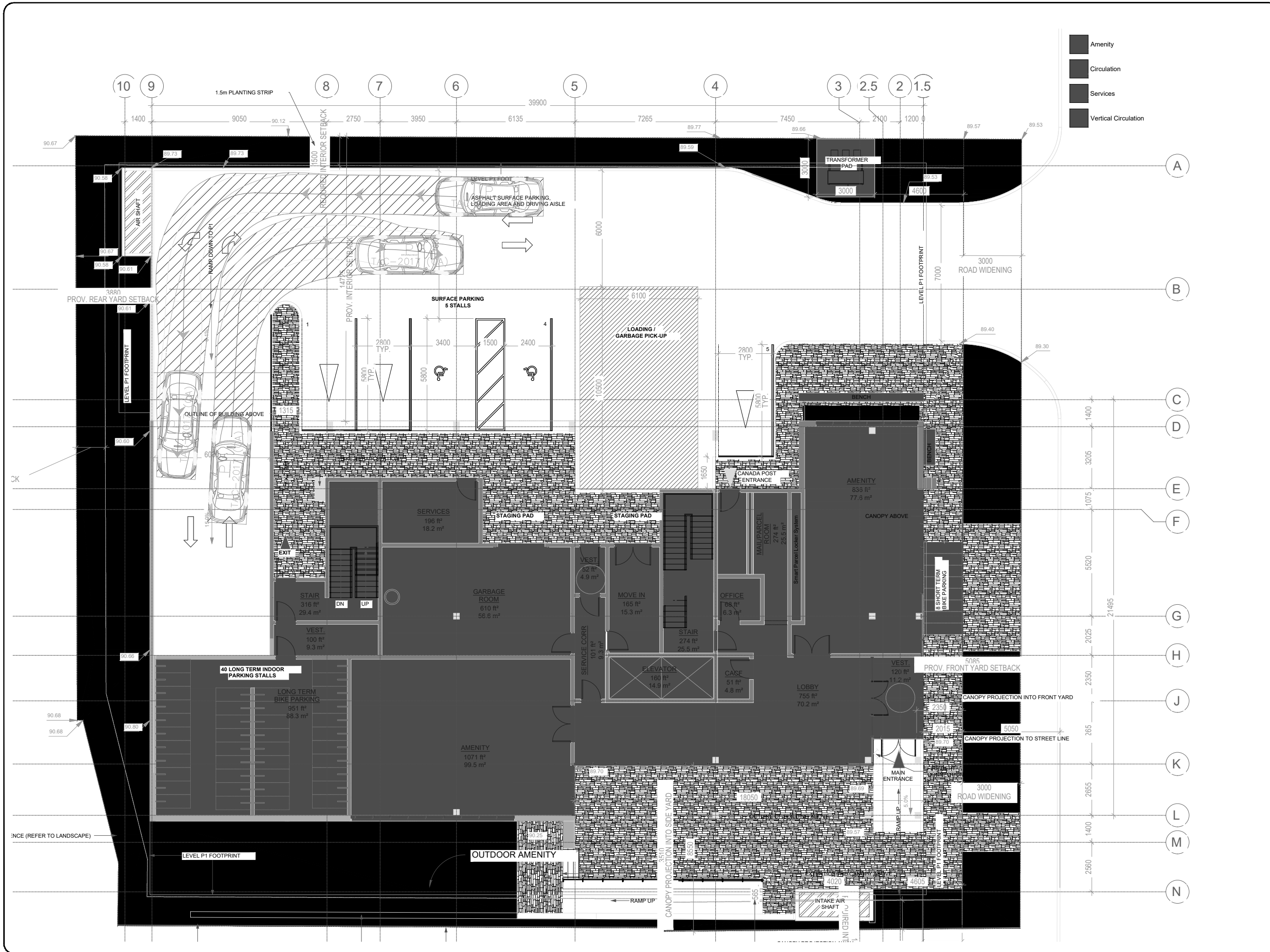
PROJECT NAME:

Residential Development
175 John Street
City of Hamilton

DRAWING TITLE:

AutoTURN Analysis
HSU TAC-2017

DESIGN BY: K.A.	DATE: November 25, 2024
CHECKED BY: R.P.	PROJECT NO. NT-22-096
DRAWN BY: K.A.	DRAWING NO.
SCALE: NTS	Figure 15



- Amenity
- Circulation
- Services
- Vertical Circulation

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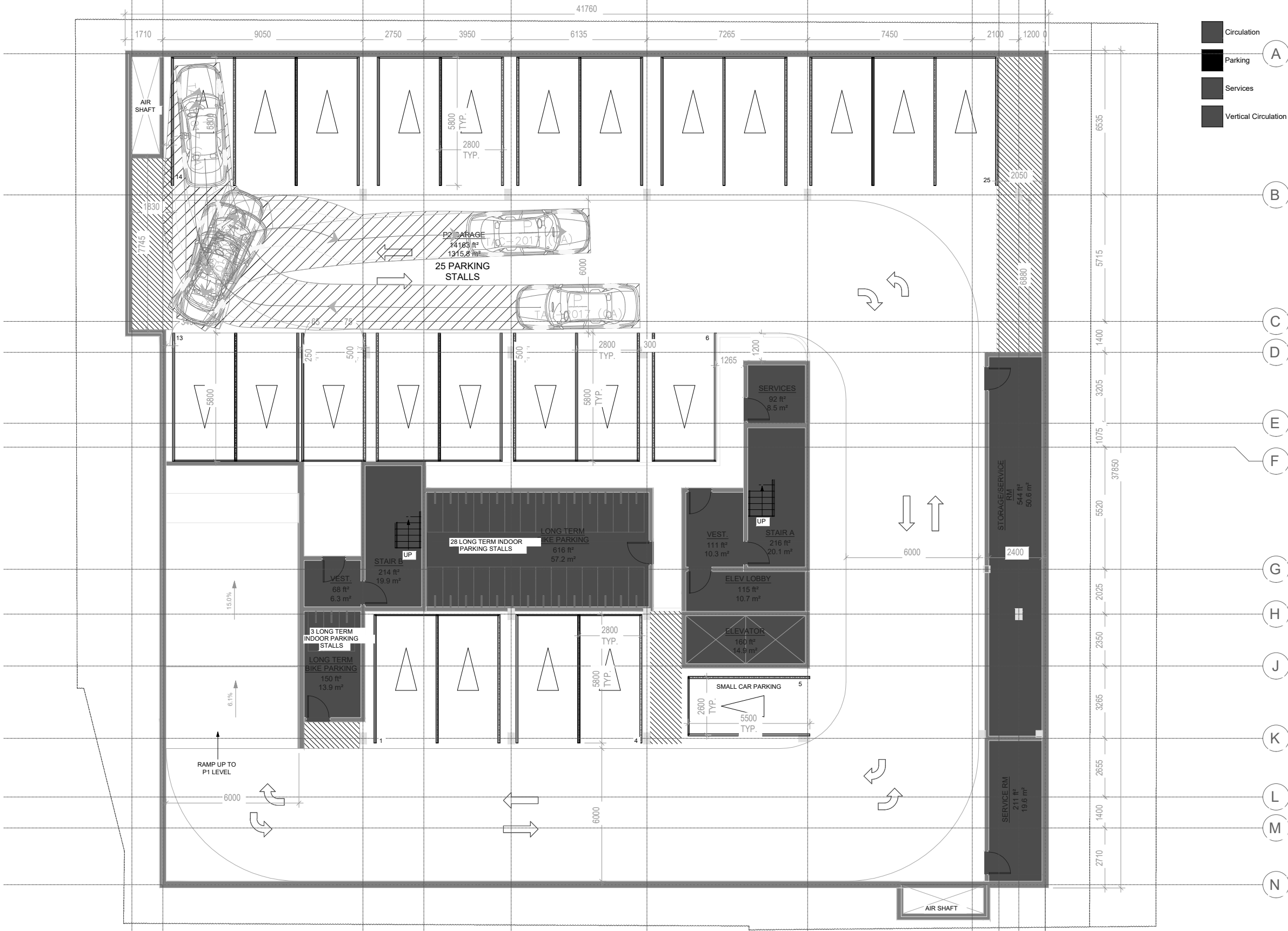


PROJECT NAME:
Residential Development
175 John Street
City of Hamilton

DRAWING TITLE:
AutoTURN Analysis
P TAC-2017

DESIGN BY: K.A.	DATE: November 25, 2024
CHECKED BY: R.P.	PROJECT NO. NT-22-096
DRAWN BY: K.A.	DRAWING NO.
SCALE: NTS	Figure 15

10 9 8 7 6 5 4 3 2.5 2 1.5



Circulation
 Parking
 Services
 Vertical Circulation

KEY PLAN

BENCHMARK

REVISIONS

NO.	REVISION	DATE	BY

STAMP

nextrans
 CONSULTING ENGINEERS
 Suite 201, 520 Industrial Parkway South
 Aurora ON L4G 6W8
 Tel: 905-503-2563
 Web: www.nextrans.ca

PROJECT NAME:
 Residential Development
 175 John Street
 City of Hamilton

DRAWING TITLE:
 AutoTURN Analysis
 P TAC-2017

DESIGN BY: K.A.	DATE: November 25, 2024
CHECKED BY: R.P.	PROJECT NO. NT-22-096
DRAWN BY: K.A.	DRAWING NO.
SCALE: NTS	Figure 16

Appendix A

Existing Traffic Data and Signal Timing Plans

City of Hamilton - Traffic Traffic Signal Controller Timing Data

Page 1 of 17

Intersection ID: 100 Timing Revision: 21-01-D

Intersection: Cannon Street East at Catharine Street North

Controller Type: Intelight TS2-2 FW Revision: D4-10032

Programmed|Checked By: CC | GD Installed By: _____

Program Date: 23-Mar-21 Install Date: _____

Reason for Timing Change: Controller Replacement

Communication: Radio System: KITS

Operation Type: FT UPS: None

APS: _____ RLC: _____

Various Equipment: _____ IP Address: 10.240.35.103



- Ø1:
- Ø2: Cannon St E - WB, EB Bicycles, North & South Crosswalks
- Ø3:
- Ø4: Catharine St N - SB, East & West Crosswalks
- Ø5:
- Ø6: No Output, Timings Only
- Ø7:
- Ø8: No Output, Timings Only

Flash Operation: Red/Red

Cannon Street East at Catharine Street North - 100 - 21-01-D

Phase Timings (D-1-1)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MinGrn		10		10		10		10								
VExt																
Max 1		50		40		50		40								
Max 2																
Max 3																
MaxExt																
Yel		3.3		3.0		3.3		3.0								
RedClr		1.9		2.5		1.9		2.5								
AdvFls																
BikeMG																
Walk		15		12		15		12								
PedClr		7		9		7		9								
Walk2																
SoLDW																
ElyWlk																
DlyWlk																
Added																
MaxInt																
MinGap																
RedAft																
TTRed																
CSMin																
CSMax																
Red Rvt	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0								
NegPed																
APDisc																
PmtGrn																
PmtWlk																
PmtPC																
RtnGrn																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Phase Options (D-1-2)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Rec																
Max Rec		2		4		6		8								
Ped Rec		2		4		6		8								
Soft Rec																
Dual Ent		2		4		6		8								
Red Rest																
Walk Rest		2		4		6		8								
Walk Expand																
Ped Recycle																
SimPedTerm																
PC Thru Clr																
Guar Psg																
No Sim Gap																
Yel Lock																
Red Lock																
PhsNxt Lock	1	2	3	4	5	6	7	8								
No Trm Call	1	2	3	4	5	6	7	8								
Cond Srv																
CS Ena																
Cond Resrv																
Reservice																
SecMinRcl																
SecMaxRcl																
Veh Omit																
Ped Omit																
Perm Phase		2		4		6		8								
Prot Call																
Prot Call2																
FlshEntry																
FlshExit																
FlshExit Yel																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FlshExit Red																
PedScrmbl																
No Min Yel																
No Min Rev																
MaxScramWlk																
FlashYel																
FlashFYA																
CNA1																
CNA2																

Phase Startup Options (D-1-3 -1)

Strtup Flash	10
Mode	Yel->Red
Strtup Red	5
Yel	0.0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Phs		2				6										
Start Yel																
Start Red																
Start NoWlk																
Start Next																
Start YFIs																
Start FYA																
No Veh Call																
No Ped Call																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Ring Sequence (D-1-5-1)

Ring 1	1
Ring 2	1
Ring 3	Off
Ring 4	Off

Ringgroup 1 (D-1-5-2)

Barriers	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Ring 1	2	4															
Ring 2	6	8															

Set Ring Config (D-1-5-4)

<input checked="" type="checkbox"/> Yes
--

Ring configuraion changes must be set to become active

MCE Options (D-1-6)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MCE Ped Prot																
MCE Call		2		4		6		8								
MCE Ped Call		2		4		6		8								
MCE Omit																
MCE Ped Omit																
MCE Veh Sync		2		4		6		8								
MCE Ped Sync		2		4		6		8								
MCE Halt DW		2		4		6		8								
LRV Phases	1	2	3	4	5	6	7	8								
MCE LRVTrmEly																

Unit (D-1-8)

Red Revert	4.0
Ped Protect	No
AdvFls in Flash	No

Cannon Street East at Catharine Street North - 100 - 21-01-D

Coordination Options (D-3-1)

Sync Time	00:00															
RTC Set	00:00															
Trans Mode	Best 2															
Ped Adjust	None															
Trans Short	15															
Trans Long	25															
Offset Ref	LagGrn															
Short Cyc	0															
Dual Entry	Normal															
Olap F/O	Disabled															
Sync Mode	RTC															
Sync Length	0															
Adapt Thresh	0															
Adapt Step	0															
Ext Plan Max	0															
Hardwire No Match	Sched															
Sync Fail	0															
Ovr Omit/Recall	No															
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No Trans Recall																
Trans Ped Call																
Trans Phases																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Coordination Pattern 1 (D-3-2)

Cycle	70															
RGrp 1 - Ofs 1	37															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		42		28		42		28								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Coordination Pattern 2 (D-3-2+)

Cycle	90															
RGrp 1 - Ofs 1	39															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		58		32		58		32								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Coordination Pattern 3 (D-3-2+)

Cycle	90															
RGrp 1 - Ofs 1	69															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		57		33		57		33								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSRerve																

Cannon Street East at Catharine Street North - 100 - 21-01-D

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at Catharine Street North - 100 - 21-01-D

TOD Patterns (D-5-1)

	Time	DOW							Holidays							Mode	Pattern	Offset		
Event 1	00:00	S	M	T	W	T	F	S										Sched	1	1
Event 2	10:00	S																Sched	3	1
Event 3	18:00	S																Sched	1	1
Event 4	06:00		M	T	W	T	F											Sched	2	1
Event 5	11:30		M	T	W	T	F											Sched	3	1
Event 6	22:30		M	T	W	T	F											Sched	1	1
Event 7	09:00							S										Sched	3	1
Event 8	22:30							S										Sched	1	1
Event 9	00:00																	Sched		

Cannon Street East at Catharine Street North - 100 - 21-01-D

I/O Interface (D-6-3)

Type	TS2-Type2
MMU Disable	Yes

Set New Cabinet (D-6-4)

Yes

Cabinet changes must be set to become active

MMU Compatibility (D-6-9)

Channels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MMUIgnore																

TS2 Detector Fail (D-6-A)

Channels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BIU 1-No Fail Call																
BIU 2-No Fail Call																

Logging (D-B)

VO Period	0
Power On	Enabled
Ext Start	Enabled
Man Control	Enabled
Cabinet Door	Enabled
MMU Faults	Enabled
BIU Faults	Enabled
Det Faults	Enabled
Coordination	Enabled
Preempt	Enabled
Soft Preempt	Disabled
Zone	Disabled
Speed Traps	Disabled

Cannon Street East at Catharine Street North - 100 - 21-01-D

Control/Config (D-9)

Pattern Mode	Centrl															
Man Pattern	0															
Man Offset	0															
Stop Time	Ena															
Aux Switch	StopTm	5														
PWD Timeout	5															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maint Phs Recall																
Maint Ped Recall																
	Used to place calls															

Data Key Transfer (D-9-NEXT)

4 read USB
5 write to USB

Autp Backup (D-9-NEXT-NEXT)

Auto Backup:	USB
Write Delay:	20

Set Time (D-5-4)

Time	00:00:00
Date	12/31/20
DLS	D4
Zone	Est
GPS Thresh	0

Press **Enter** after setting Time/Date - **ESC** sets time

Cannon Street East at Catharine Street North - 100 - 21-01-D

Serial Port 1 (D-A-1)

Serial Port 1	4						
Baud Rate	38400	8N1		RTS On	0	RTS Off	0
Broadcst Pln/Syn	Disabled		Time	0:00			
Serial Rebroad	Dis		Response	None			

Serial Port 2 (D-A-2)

Serial Port 2	0						
Baud Rate	4800	8N1		RTS On	0	RTS Off	0
Broadcst Pln/Syn	Disabled		Time	0:00			

Ethernet Config (D-A-3)

IP Address	10	240	35	103	Port	161
Netmask	255	255	255	0	Mode	Host
Gateway	10	240	35	1		
Broadcast Address	0	0	0	0		
Broadcast Port	0		Time Port	0		
Broadcst Pln/Syn	Disabled		Time	0:00		
Serial Rebroad	Dis		Response	Time/Plan		
Gateway 2	0	0	0	0		
Gateway 3	0	0	0	0		
Gateway 4	0	0	0	0		

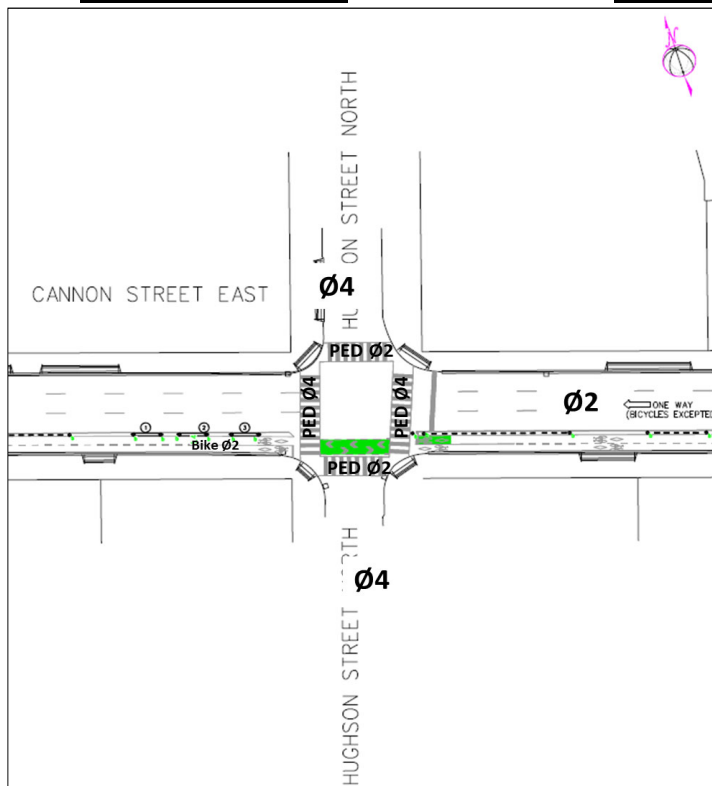
General Comm Config (D-A-4)

Database ID#	100		
Cont Address	1	Timeout	0
Peer Address	0	Timeout	0
Remote Calls	Dis		
Remote Preempt	Dis		
Remote Soft Preempt	Dis		
Remote Priority	Dis		
Remote MCE	Dis	MCE Max	0

City of Hamilton - Traffic Traffic Signal Controller Timing Data

Page 1 of 17

Intersection ID: <u>280</u>	Timing Revision: <u>21-01-D</u>
Intersection: <u>Cannon Street East at Hughson Street North</u>	
Controller Type: <u>Intelight TS2-2</u>	FW Revision: <u>D4-10032</u>
Programmed|Checked By: <u>CC</u> | <u>GD</u>	Installed By: _____
Program Date: <u>29-Mar-21</u>	Install Date: _____
Reason for Timing Change: <u>Controller Replacement</u>	
Communication: <u>Radio</u>	System: <u>KITS</u>
Operation Type: <u>FT</u>	UPS: <u>None</u>
APS: _____	RLC: _____
Various Equipment: _____	IP Address: <u>10.240.35.123</u>



- Ø1:
- Ø2: Cannon St E - WB, EB Bicycles, North & South Crosswalks
- Ø3:
- Ø4: Hughson St N - NB/SB, East/West Crosswalks
- Ø5:
- Ø6: No Output, Timings Only
- Ø7:
- Ø8: No Output, Timings Only

Flash Operation: Red/Red

Cannon Street East at Hughson Street North - 280 - 21-01-D

Phase Timings (D-1-1)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MinGrn		10		10		10		10								
VExt																
Max 1		30		30		30		30								
Max 2																
Max 3																
MaxExt																
Yel		3.3		3.3		3.3		3.3								
RedClr		1.7		2.4		1.7		2.4								
AdvFls																
BikeMG																
Walk		12		8		12		8								
PedClr		11		10		11		10								
Walk2																
SoIDW																
ElyWlk																
DlyWlk																
Added																
MaxInt																
MinGap																
RedAft																
TTRed																
CSMin																
CSMax																
Red Rvt	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0								
NegPed																
APDisc																
PmtGrn																
PmtWlk																
PmtPC																
RtnGrn																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Phase Options (D-1-2)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Rec																
Max Rec		2		4		6		8								
Ped Rec		2		4		6		8								
Soft Rec																
Dual Ent		2		4		6		8								
Red Rest																
Walk Rest		2		4		6		8								
Walk Expand																
Ped Recycle																
SimPedTerm																
PC Thru Clr																
Guar Psg																
No Sim Gap																
Yel Lock																
Red Lock																
PhsNxt Lock	1	2	3	4	5	6	7	8								
No Trm Call	1	2	3	4	5	6	7	8								
Cond Srv																
CS Ena																
Cond Resrv																
Reservice																
SecMinRcl																
SecMaxRcl																
Veh Omit																
Ped Omit																
Perm Phase		2		4		6		8								
Prot Call																
Prot Call2																
FlshEntry																
FlshExit																
FlshExit Yel																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FlshExit Red																
PedScrmbl																
No Min Yel																
No Min Rev																
MaxScramWlk																
FlashYel																
FlashFYA																
CNA1																
CNA2																

Phase Startup Options (D-1-3 -1)

Strtup Flash	10
Mode	Yel->Red
Strtup Red	5
Yel	0.0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Phs		2				6										
Start Yel																
Start Red																
Start NoWlk																
Start Next																
Start YFIs																
Start FYA																
No Veh Call																
No Ped Call																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Ring Sequence (D-1-5-1)

Ring 1	1
Ring 2	1
Ring 3	Off
Ring 4	Off

Ringgroup 1 (D-1-5-2)

Barriers	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Ring 1	2	4															
Ring 2	6	8															

Set Ring Config (D-1-5-4)

<input checked="" type="checkbox"/> Yes
--

Ring configuraion changes must be set to become active

MCE Options (D-1-6)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MCE Ped Prot																
MCE Call		2		4		6		8								
MCE Ped Call		2		4		6		8								
MCE Omit																
MCE Ped Omit																
MCE Veh Sync		2		4		6		8								
MCE Ped Sync		2		4		6		8								
MCE Halt DW		2		4		6		8								
LRV Phases	1	2	3	4	5	6	7	8								
MCE LRVTrmEly																

Unit (D-1-8)

Red Revert	4.0
Ped Protect	No
AdvFls in Flash	No

Cannon Street East at Hughson Street North - 280 - 21-01-D

Coordination Options (D-3-1)

Sync Time	00:00															
RTC Set	00:00															
Trans Mode	Best 2															
Ped Adjust	None															
Trans Short	15															
Trans Long	25															
Offset Ref	LagGrn															
Short Cyc	0															
Dual Entry	Normal															
Olap F/O	Disabled															
Sync Mode	RTC															
Sync Length	0															
Adapt Thresh	0															
Adapt Step	0															
Ext Plan Max	0															
Hardwire No Match	Sched															
Sync Fail	0															
Ovr Omit/Recall	No															
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No Trans Recall																
Trans Ped Call																
Trans Phases																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Coordination Pattern 1 (D-3-2)

Cycle	70															
RGrp 1 - Ofs 1	57															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		45		25		45		25								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Coordination Pattern 2 (D-3-2+)

Cycle	90															
RGrp 1 - Ofs 1	49															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		59		31		59		31								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Coordination Pattern 3 (D-3-2+)

Cycle	90															
RGrp 1 - Ofs 1	80															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		59		31		59		31								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at Hughson Street North - 280 - 21-01-D

TOD Patterns (D-5-1)

	Time	DOW							Holidays							Mode	Pattern	Offset		
Event 1	00:00	S	M	T	W	T	F	S										Sched	1	1
Event 2	10:00	S																Sched	3	1
Event 3	18:00	S																Sched	1	1
Event 4	06:00		M	T	W	T	F											Sched	2	1
Event 5	11:30		M	T	W	T	F											Sched	3	1
Event 6	22:30		M	T	W	T	F											Sched	1	1
Event 7	09:00							S										Sched	3	1
Event 8	22:30							S										Sched	1	1
Event 9	00:00																	Sched		

Cannon Street East at Hughson Street North - 280 - 21-01-D

I/O Interface (D-6-3)

Type	TS2-Type2
MMU Disable	Yes

Set New Cabinet (D-6-4)

Yes

Cabinet changes must be set to become active

MMU Compatibility (D-6-9)

Channels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MMUIgnore																

TS2 Detector Fail (D-6-A)

Channels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BIU 1-No Fail Call																
BIU 2-No Fail Call																

Cannon Street East at Hughson Street North - 280 - 21-01-D

Logging (D-B)

VO Period	0
Power On	Enabled
Ext Start	Enabled
Man Control	Enabled
Cabinet Door	Enabled
MMU Faults	Enabled
BIU Faults	Enabled
Det Faults	Enabled
Coordination	Enabled
Preempt	Enabled
Soft Preempt	Disabled
Zone	Disabled
Speed Traps	Disabled

Cannon Street East at Hughson Street North - 280 - 21-01-D

Control/Config (D-9)

Pattern Mode	Sched															
Man Pattern	0															
Man Offset	0															
Stop Time	Ena															
Aux Switch	StopTm	5														
PWD Timeout	5															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maint Phs Recall																
Maint Ped Recall																
	Used to place calls															

Data Key Transfer (D-9-NEXT)

4 read USB
5 write to USB

Autp Backup (D-9-NEXT-NEXT)

Auto Backup:	USB
Write Delay:	20

Set Time (D-5-4)

Time	00:00:00
Date	12/31/20
DLS	D4
Zone	Est
GPS Thresh	0

Press **Enter** after setting Time/Date - **ESC** sets time

Cannon Street East at Hughson Street North - 280 - 21-01-D

Serial Port 1 (D-A-1)

Serial Port 1	4						
Baud Rate	38400	8N1		RTS On	0	RTS Off	0
Broadcst Pln/Syn	Disabled		Time	0:00			
Serial Rebroad	Dis		Response	None			

Serial Port 2 (D-A-2)

Serial Port 2	0						
Baud Rate	4800	8N1		RTS On	0	RTS Off	0
Broadcst Pln/Syn	Disabled		Time	0:00			

Ethernet Config (D-A-3)

IP Address	10	240	35	123	Port	161
Netmask	255	255	255	0	Mode	Host
Gateway	10	240	35	1		
Broadcast Address	0	0	0	0		
Broadcast Port	0		Time Port	0		
Broadcst Pln/Syn	Disabled		Time	0:00		
Serial Rebroad	Dis		Response	Time/Plan		
Gateway 2	0	0	0	0		
Gateway 3	0	0	0	0		
Gateway 4	0	0	0	0		

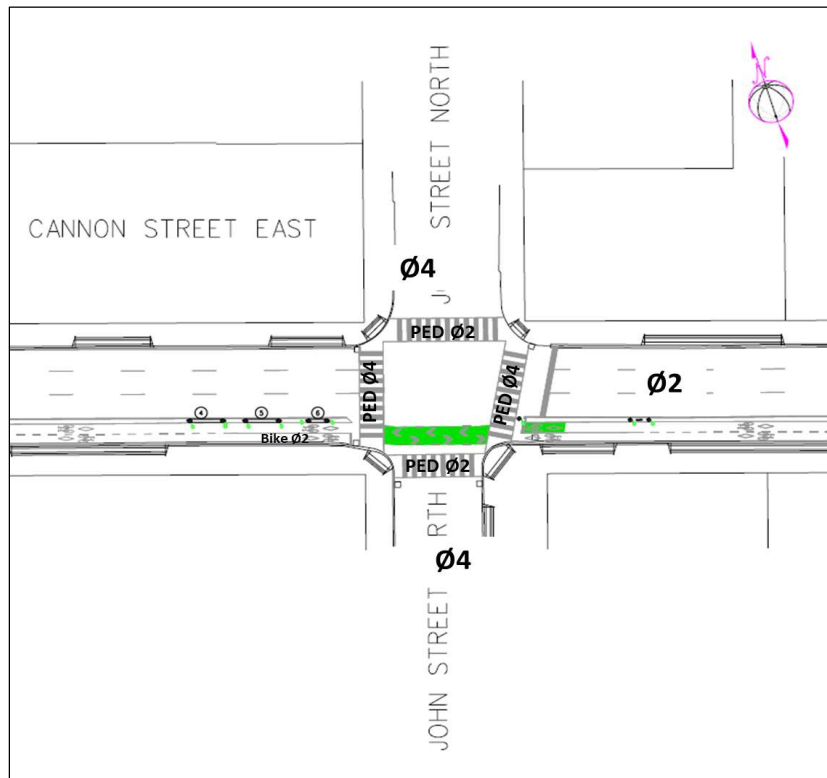
General Comm Config (D-A-4)

Database ID#	280		
Cont Address	1	Timeout	0
Peer Address	0	Timeout	0
Remote Calls	Dis		
Remote Preempt	Dis		
Remote Soft Preempt	Dis		
Remote Priority	Dis		
Remote MCE	Dis	MCE Max	0

City of Hamilton - Traffic Traffic Signal Controller Timing Data

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Intersection ID: <u>20</u>	Timing Revision: <u>21-01-D</u>
Intersection: <u>Cannon Street East at John Street North</u>	
Controller Type: <u>Intelight TS2-2</u>	FW Revision: <u>D4-10032</u>
Programmed/Checked By: <u>CC</u> | <u>GD</u>	Installed By: _____
Program Date: <u>29-Mar-21</u>	Install Date: _____
Reason for Timing Change: <u>Controller Replacement</u>	
Communication: <u>Radio</u>	System: <u>KITS</u>
Operation Type: <u>FT</u>	UPS: <u>None</u>
APS: _____	RLC: _____
Various Equipment: _____	IP Address: <u>10.240.35.113</u>



- φ1:
- φ2: Cannon St E - WB, EB Bicycles, North & South Crosswalks
- φ3:
- φ4: John St N - NB/SB, East/West Crosswalks
- φ5:
- φ6: No Output, Timings Only
- φ7:
- φ8: No Output, Timings Only

Flash Operation: Red/Red

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Phase Timings (D-1-1)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MinGrn		10		10		10		10								
VExt																
Max 1		45		40		45		40								
Max 2																
Max 3																
MaxExt																
Yel		3.3		3.3		3.3		3.3								
RedClr		2.0		2.1		2.0		2.1								
AdvFls																
BikeMG																
Walk		12		12		12		12								
PedClr		11		10		11		10								
Walk2																
SolDW																
ElyWik																
DlyWik																
Added																
MaxInt																
MinGap																
RedAft																
TTRed																
CSMin																
CSMax																
Red Rvt	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0								
NegPed																
APDisc																
PmtGrn																
PmtWik																
PmtPC																
RtnGrn																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Phase Options (D-1-2)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Rec																
Max Rec		2		4		6		8								
Ped Rec		2		4		6		8								
Soft Rec																
Dual Ent		2		4		6		8								
Red Rest																
Walk Rest		2		4		6		8								
Walk Expand																
Ped Recycle																
SimPedTerm																
PC Thru Clr																
Guar Psg																
No Sim Gap																
Yel Lock																
Red Lock																
PhsNxt Lock	1	2	3	4	5	6	7	8								
No Trm Call	1	2	3	4	5	6	7	8								
Cond Srv																
CS Ena																
Cond Resrv																
Reservice																
SecMinRcl																
SecMaxRcl																
Veh Omit																
Ped Omit																
Perm Phase		2		4		6		8								
Prot Call																
Prot Call2																
FlshEntry																
FlshExit																
FlshExit Yel																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FlshExit Red																
PedScrambl																
No Min Yel																
No Min Rev																
MaxScramWik																
FlashYel																
FlashFYA																
CNA1																
CNA2																

Phase Startup Options (D-1-3 -1)

Strtup Flash	10
Mode	Yel->Red
Strtup Red	5
Yel	0.0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Phs		2				6										
Start Yel																
Start Red																
Start NoWik																
Start Next																
Start YFIs																
Start FYA																
No Veh Call																
No Ped Call																

Ring Sequence (D-1-5-1)

Ring 1	1
Ring 2	1
Ring 3	Off
Ring 4	Off

Ringgroup 1 (D-1-5-2)

Barriers	.	X	.	X	.	.	.	.	.	.	.	.	.	.	.	.
Ring 1	2	4														
Ring 2	6	8														

Set Ring Config (D-1-5-4)

Yes	Ring configuraion changes must be set to become active
------------	--

MCE Options (D-1-6)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MCE Ped Prot																
MCE Call		2		4		6		8								
MCE Ped Call		2		4		6		8								
MCE Omit																
MCE Ped Omit																
MCE Veh Sync		2		4		6		8								
MCE Ped Sync		2		4		6		8								
MCE Halt DW		2		4		6		8								
LRV Phases	1	2	3	4	5	6	7	8								
MCE LRVTrmEly																

Unit (D-1-8)

Red Revert	4.0
Ped Protect	No
AdvFls in Flash	No

Coordination Options (D-3-1)

Sync Time	00:00															
RTC Set	00:00															
Trans Mode	Best 2															
Ped Adjust	None															
Trans Short	15															
Trans Long	25															
Offset Ref	LagGrn															
Short Cyc	0															
Dual Entry	Normal															
Olap F/O	Disabled															
Sync Mode	RTC															
Sync Length	0															
Adapt Thresh	0															
Adapt Step	0															
Ext Plan Max	0															
Hardwire No Match	Sched															
Sync Fail	0															
Ovr Omit/Recall	No															
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No Trans Recall																
Trans Ped Call																
Trans Phases																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Coordination Pattern 1 (D-3-2)

Cycle	70															
RGrp 1 - Ofs 1	47															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		42		28		42		28								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WikRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Coordination Pattern 2 (D-3-2+)

Cycle	90															
RGrp 1 - Ofs 1	44															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		54		36		54		36								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Coordination Pattern 3 (D-3-2+)

Cycle	90															
RGrp 1 - Ofs 1	74															
RGrp 1 - Ofs 2	0															
RGrp 1 - Ofs 3	0															
RGrp 2 - Ofs 1	0															
RGrp 2 - Ofs 2	0															
RGrp 2 - Ofs 3	0															
Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split		59		31		59		31								
Ext																
Float																
PermMin		12		12		12		12								
MinTrans																
MaxTrans																
Split2																
PA Bef																
PA Aft																
Phases /Overlaps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord		2				6										
No Extend																
FloatEna																
V=P Perm																
Wlk Rst																
PedRcl																
CondPed																
OlpPedRcl																
PedRcy																
MinRcl																
MaxRcl																
CondSrv																
Reserve																
CSReserve																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

Phs /Olap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SecMinRcl																
SecMaxRcl																
VehOmt																
PedOmt																
Olap Omit																
Perm Rsv																
Perm 1																
Max Inh																
FYA Omt																
AdaptPhs																
AltSeq																
Perm	SingBnd															
Ped Permissive	Yield															
PermLmt	1															
Prm2Str	0															
Prm2End	0															
Max	MaxInh															
WlkRest	OppCall															
TODLnk	0															
Trans Mode	Default															
Offset Ref	Default															
Adapt Mode	Disabled															
Rng 1 Late																
Rng 2 Late																
Rng 3 Late																
Rng 4 Late																

Cannon Street East at John Street North - 020 - 21-01-D.xlsx

TOD Patterns (D-5-1)

	Time	DOW							Holidays							Mode	Pattern	Offset	
Event 1	00:00	S	M	T	W	T	F	S									Sched	1	1
Event 2	10:00	S															Sched	3	1
Event 3	18:00	S															Sched	1	1
Event 4	06:00		M	T	W	T	F										Sched	2	1
Event 5	11:30		M	T	W	T	F										Sched	3	1
Event 6	22:30		M	T	W	T	F										Sched	1	1
Event 7	09:00							S									Sched	3	1
Event 8	22:30							S									Sched	1	1
Event 9	00:00																Sched		

I/O Interface (D-6-3)

Type	TS2-Type2
MMU Disable	Yes

Set New Cabinet (D-6-4)

Yes

Cabinet changes must be set to become active

MMU Compatibility (D-6-9)

Channels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MMUIgnore																

TS2 Detector Fail (D-6-A)

Channels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BIU 1-No Fail Call																
BIU 2-No Fail Call																

Logging (D-B)

VO Period	0
Power On	Enabled
Ext Start	Enabled
Man Control	Enabled
Cabinet Door	Enabled
MMU Faults	Enabled
BIU Faults	Enabled
Det Faults	Enabled
Coordination	Enabled
Preempt	Enabled
Soft Preempt	Disabled
Zone	Disabled
Speed Traps	Disabled

Control/Config (D-9)

Pattern Mode	Sched															
Man Pattern	0															
Man Offset	0															
Stop Time	Ena															
Aux Switch	StopTm		5													
PWD Timeout	5															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maint Phs Recall																
Maint Ped Recall																
	Used to place calls															

Data Key Transfer (D-9-NEXT)

4 read USB
5 write to USB

Autp Backup (D-9-NEXT-NEXT)

Auto Backup:	USB
Write Delay:	20

Set Time (D-5-4)

Time	00:00:00
Date	12/31/20
DLS	D4
Zone	Est
GPS Thresh	0

Press **Enter** after setting Time/Date - **ESC** sets time

Serial Port 1 (D-A-1)

Serial Port 1	4					
Baud Rate	38400	8N1		RTS On	0	RTS Off 0
Broadcst Pln/Syn	Disabled			Time	0:00	
Serial Rebroad	Dis			Response	None	

Serial Port 2 (D-A-2)

Serial Port 2	0					
Baud Rate	4800	8N1		RTS On	0	RTS Off 0
Broadcst Pln/Syn	Disabled			Time	0:00	

Ethernet Config (D-A-3)

IP Address	10	240	35	113	Port	161
Netmask	255	255	255	0	Mode	Host
Gateway	10	240	35	1		
Broadcast Address	0	0	0	0		
Broadcast Port	0			Time Port	0	
Broadcst Pln/Syn	Disabled			Time	0:00	
Serial Rebroad	Dis			Response	Time/Plan	
Gateway 2	0	0	0	0		
Gateway 3	0	0	0	0		
Gateway 4	0	0	0	0		

General Comm Config (D-A-4)

Database ID#	20		
Cont Address	1	Timeout	0
Peer Address	0	Timeout	0
Remote Calls	Dis		
Remote Preempt	Dis		
Remote Soft Preempt	Dis		
Remote Priority	Dis		
Remote MCE	Dis	MCE Max	0

START-UP MENU

MIN FLASH	010
AUTO PEDCLEAR (ON/OFF)	ON
BACK-UP TIME	00300
DATABASE TRANSACTION TIME	00000
RED REVERT	0.0
YEL WARN CLEARANCE	0.0
YELLOW CLEARANCE	0.0
RED CLEARANCE	5.0

											1	1	1	1	1	1	1
START-UP	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	
GREEN																	
WALK																	
YEL WRN																	
YELLOW																	
RED				X													

NOTE: Phase Compatibility Ring Assignment (2.1.3) and Phase Enables (2.2.1) must be completed prior to Start-up Phase Assignment

2.1.3

PHASE COMPATIBILITY

PG 1 of 2

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RING	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0

COMPATIBILITY PHASES

PHASE 1																
PHASE 2																
PHASE 3																
PHASE 4																
PHASE 5																
PHASE 6																
PHASE 7																
PHASE 8																

2.1.4.1

CHANNEL SET-UP MENU

PG 1 of 2

CHANNEL	1	2	3	4	5	6	7	8
TYPE	veh	veh	veh	veh	veh	veh	veh	veh
SOURCE	1	2	3	4	5	6	7	8

TYPE value:	veh,	ped,	vol,	pol,	qj
SOURCE range:	1-16	1-16	1-32	1-16	1-8

DIMMING

CHANNEL	1	2	3	4	5	6	7	8
GREEN								
YELLOW								
RED								
ALT1/2								

2.1.4.2

CHANNEL SET-UP MENU

CHANNEL	9	10	11	12	13	14	15	16
TYPE	ped	ped	ped	ped	veh	veh	veh	veh
SOURCE	2	4	6	8	0	0	0	0

TYPE value:	veh,	ped,	vol,	pol,	qj
SOURCE range:	1-16	1-16	1-32	1-16	1-8

DIMMING

CHANNEL	9	10	11	12	13	14	15	16
GREEN								
YELLOW								
RED								
ALT1/2								

2.1.5.2

PORT 2-5 PARAMETERS

PORT	2	3	4	5	
PARITY	0	0	0	0	(0 = None; 1 = Odd; 2 = Even)
STOP BITS	1	1	1	1	(1 = One Stop Bit; 2 = Two Stop Bits)
BAUD RATE	7	7	7	7	(1 =1200; 2 =4800; 3 =9600; 4 =19200; 5 =38400; 6 =57600; 7 =115200)
HW FLOW	0	0	0	0	(0 = None; 1 = HW Flow On)
HDLC Group Address	0				(0 - 62) Controller's Group Address for NTCIP Central System

2.1.5.3

IP/CABINET ADDRESS SET-UP

Cabinet Address:	FE36
IP Address SYSTEM:	10.240.254.54
IP Address LOCAL:	10.240.254.154
SubNet Address SYSTEM:	255.255.255.0
SubNet Address LOCAL:	255.255.255.0
Gateway SYSTEM:	000.000.000.000
Gateway LOCAL:	000.000.000.000
SNMP Port:	0

2.1.5.5

DHCP SET-UP

Current SYSTEM IP:	
Current LOCAL IP:	
Current System SubNet:	255.255.255.0
Current Local SubNet:	255.255.255.0
Gateway SYSTEM:	000.000.000.000
Gateway LOCAL:	000.000.000.000
DHCP Enable:	<input checked="" type="checkbox"/> SYSTEM <input type="checkbox"/> LOCAL <input type="checkbox"/>

RING SEQUENCING

PG 1 of 20

SEQUENCE NUM 1

RING																
1	2	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

2.1.7

USTC MISC MENU

PG 1 of 1

LANGUAGE	: English(0)
STEADY RED DURING FLASH	: 000
REQUEST TIME SYNC	: OFF
PHASE NEXT CONTROL	: persistent(0)
PATTERN 254 DIAMOND SEQ	: NEMA Quad(1)
ICC ENABLE	: 0
MIZBAT MASTER ID	: 0
MIZBAT LOCAL ID	: 0
SIMULTANEOUS FDW	: OFF
DIAMOND ENABLE	: OFF
GREEN WARNING	: Disable(0)
YEL WARNING FLASH RATE	: SteadyOn(0)

2.2.1

PHASE ENABLE MENU

PG 1 of 1

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ENABLE		X		X												

2.2.2.1

GREEN TIMING MENU 1

PG 1 of 2

PHASE	1	2	3	4	5	6	7	8
MINIMUM GREEN	0	20	0	10	0	0	0	0
PASSAGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAXIMUM 1	0	30	0	22	0	0	0	0
MAXIMUM 2	0	50	0	22	0	0	0	0
WARNING DELAY TIME	0	0	0	0	0	0	0	0

2.2.3.1

CLEARANCE TIMINGS MENU

PG 1 of 2

PHASE	1	2	3	4	5	6	7	8
YELLOW WARNING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW CLEARANCE	0.0	3.3	0.0	3.0	0.0	0.0	0.0	0.0
RED CLEARANCE	0.0	2.5	0.0	2.0	0.0	0.0	0.0	0.0
RED REVERT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2.2.4.1

PED TIMINGS MENU

PG 1 of 2

PHASE	1	2	3	4	5	6	7	8
PED WALK	0	0	0	12	0	0	0	0
PED CLEARANCE	0	0	0	10	0	0	0	0
WALK MODE DELAY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WALK MODE DELAY	2	2	2	2	2	2	2	2
	nema	nema	nema	nema	nema	nema	nema	nema

2 = nema, 3 = walk (Adv Ped) , 3 = grn (Delay Ped)

2.2.8.1

PHASE OPTIONS

PG 1 of 2

PHASE	1	2	3	4	5	6	7	8
CALL TO NON-ACT 1								
CALL TO NON-ACT 2								
DUAL ENTRY								
NO SIMULTANEOUS GAP OUT								
GUARANTEED PASSAGE								
ACTUATED REST IN WALK								
CONDITIONAL SERVICE								
ADDED INITIAL CALC								
FDW THRU YEL WRN								
FDW THRU YEL WRN & YEL								
FDW THRU YEL WRN & Y & R								

2.2.9.1

PHASE RECALLS

PG 1 of 2

PHASE	1	2	3	4	5	6	7	8
VEHICLE MINIMUM								
VEHICLE MAXIMUM		X						
PEDESTRIAN RECALL								
DETECTOR NON LOCK				X				
SOFT RECALL								

TOD ACTION

PG 1 of 6

Actn:	1	2	3	4	5	6	7	8
PATT:	254	254	0	0	0	0	0	0
TSP:	0	0	0	0	0	0	0	0

C O M M A N D	1:		X					
	2:							
	3:							
	4:							
	5:							
	6:							
	7:							
	8:							

2.4.2.1

DAY PLAN

TOD DAY PLANS

1

PG 1 of 32

EVENT #	1	2	3	4	5	6	7	8
HOUR	0	0	0	0	0	0	0	0
MIN	0	0	0	0	0	0	0	0
ACTION	1	0	0	0	0	0	0	0
EVENT #	9	10	11	12	13	14	15	16
HOUR	0	0	0	0	0	0	0	0
MIN	0	0	0	0	0	0	0	0
ACTION	0	0	0	0	0	0	0	0

2.4.2.2

DAY PLAN

TOD DAY PLANS

2

PG 2 of 32

EVENT #	1	2	3	4	5	6	7	8
HOUR	0	6	9	15	18	0	0	0
MIN	0	30	30	30	0	0	0	0
ACTION	1	2	1	2	1	0	0	0
EVENT #	9	10	11	12	13	14	15	16
HOUR	0	0	0	0	0	0	0	0
MIN	0	0	0	0	0	0	0	0
ACTION	0	0	0	0	0	0	0	0

2.4.3.1

TOD SCHEDULES

PG 1 of 32

ENTRY

01

SCHEDULE	J	F	M	A	M	J	J	A	S	O	N	D
MONTH	X	X	X	X	X	X	X	X	X	X	X	X

SCHEDULE	S	M	T	W	T	F	S
DAY	X						X

SCHEDULE	1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1
DATE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SCHEDULE	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	
DATE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

SCHEDULE DAY PLAN

2.4.3.2

TOD SCHEDULES

PG 2 of 32

ENTRY

02

SCHEDULE	J	F	M	A	M	J	J	A	S	O	N	D
MONTH	X	X	X	X	X	X	X	X	X	X	X	X

SCHEDULE	S	M	T	W	T	F	S
DAY		X	X	X	X	X	

SCHEDULE	1	2	3	4	5	6	7	8	9	0	1	1	1	1	1	1
DATE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SCHEDULE	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	
DATE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

SCHEDULE DAY PLAN

2.4.4

COMMAND ACTION #1

PG 1 of 1

0 ring max2 (14)

Rings	1	2	3	4
Enable	X			

1 not assigned (0)

- 2
- 3
- 4
- 5
- 6
- 8
- 9

2.4.6

ADVANCED TIME SET

PG 1 of 1

GLOBAL TIME HOUR	##
GLOBAL TIME MINUTE	##
GLOBAL TIME SECOND	##
GLOBAL YEAR	####
GLOBAL MONTH	##
GLOBAL DAY	##
CU STANDARD TIME ZONE	-18000

2.4.7

DST by Occurrences of DOW

PG 1 of 8

Begin Month:	03
Begin Occur: (week)	2
Begin Day of Week:	1
Begin day of Month:	01
Begin Mins from Midnight:	0060
End Month:	11
End Occur: (week)	1
End Day of Week:	1
End day of Month:	01
End Mins from Midnight:	0060
Minutes to Adjust Time:	0010

VEH DETECTOR OPTIONS

PG 1 of 4

DET NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
OPTION:																
CALL																
QUEUE																
ADD INIT																
PASSAGE																
RED LOCK																
YEL LOCK																
OCC DET																
VOL DET																
GAP TIME																

RESET																
-------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

2.5.2.1

VEH DETECTOR OPTIONS

PG 1 of 8

QUEUE	0	0	0	0	0	0	0	0
NO ACT	0	0	0	0	0	0	0	0
MAX PRS	0	0	0	0	0	0	0	0
ERR CTS	0	0	0	0	0	0	0	0
FAIL T	0	0	0	0	0	0	0	0
DET NO.	1	2	3	4				
DELAY	0.0	0.0	0.0	0.0				
EXTEND	0.0	0.0	0.0	0.0				
GAP TIME	0.0	0.0	0.0	0.0				
REDUCE	0.0	0.0	0.0	0.0				
DET NO.	5	6	7	8				
DELAY	0.0	0.0	0.0	0.0				
EXTEND	0.0	0.0	0.0	0.0				
GAP TIME	0.0	0.0	0.0	0.0				
REDUCE	0.0	0.0	0.0	0.0				

DETECTOR CALL PHASES

PG 1 of 2

DET NO.	1	2	3	4	5	6	7	8
Phase No	0	0	0	4	0	0	0	0

DET NO.	9	10	11	12	13	14	15	16
Phase No	0	0	0	0	0	0	0	0

DET NO.	17	18	19	20	21	22	23	24
Phase No	0	0	0	0	0	0	0	0

DET NO.	25	26	27	28	29	30	31	32
Phase No	0	0	0	0	0	0	0	0

2.5.4

DETECTOR SWITCH PHASES

PG 1 of 2

DET NO.	1	2	3	4	5	6	7	8
Phase No	0	0	0	0	0	0	0	0

DET NO.	9	10	11	12	13	14	15	16
Phase No	0	0	0	0	0	0	0	0

DET NO.	17	18	19	20	21	22	23	24
Phase No	0	0	0	0	0	0	0	0

DET NO.	25	26	27	28	29	30	31	32
Phase No	0	0	0	0	0	0	0	0

2.5.5

PEDESTRIAN DETECTORS

PG 1 of 1

DET NO.	1	2	3	4	5	6	7	8
CALL PH	0	0	0	4	0	0	0	0
NO ACTIV	0	0	0	0	0	0	0	0
MAX PRES	0	0	0	0	0	0	0	0
ERR CNT	0	0	0	0	0	0	0	0



Turning Movement Count (3 . CANNON ST E & CATHARINE ST N)

Start Time	N Approach CATHARINE ST						E Approach CANNON ST						S Approach CATHARINE ST						W Approach CANNON ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N-W	Thru N-S	Left N-E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E-W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S-W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	3	1	0	0	0	4	0	285	1	0	0	286	0	0	0	0	1	0	0	1	0	0	1	1	291	
07:15:00	2	1	0	0	1	3	0	288	3	0	0	291	0	0	0	0	6	0	0	2	0	0	2	2	296	
07:30:00	3	3	0	0	2	6	0	303	8	0	2	311	0	0	0	0	0	0	0	4	0	0	0	4	321	
07:45:00	1	5	0	0	4	6	0	305	9	0	4	314	0	0	0	0	2	0	0	2	0	0	1	2	322	1230
08:00:00	6	5	0	0	3	11	0	321	9	0	3	330	0	0	0	0	6	0	0	5	0	0	0	5	346	1285
08:15:00	7	4	0	0	9	11	0	327	11	0	3	338	0	0	0	0	7	0	0	1	0	0	3	1	350	1339
08:30:00	3	2	1	0	8	6	0	279	12	0	7	291	0	0	0	0	18	0	0	0	0	0	1	0	297	1315
08:45:00	4	7	0	0	17	11	0	257	6	0	13	263	0	0	0	0	12	0	0	5	0	0	6	5	279	1272
09:00:00	3	4	0	0	11	7	0	231	11	0	7	242	0	0	0	0	13	0	0	4	0	0	7	4	253	1179
09:15:00	4	5	0	0	10	9	0	211	7	0	3	218	0	0	0	0	1	0	0	0	0	0	2	0	227	1056
09:30:00	7	1	0	0	6	8	0	186	8	0	2	194	0	0	0	0	2	0	0	1	0	0	0	1	203	962
09:45:00	5	5	0	0	7	10	0	174	10	0	3	184	1	0	0	0	8	1	0	1	0	0	3	1	196	879
BREAK																										
16:00:00	2	3	0	0	6	5	0	249	12	0	5	261	0	0	0	0	2	0	0	6	0	0	2	6	272	
16:15:00	3	8	0	0	2	11	0	265	8	0	7	273	0	0	0	0	9	0	0	2	0	0	1	2	286	
16:30:00	8	4	1	0	6	13	2	284	12	0	4	298	0	0	0	0	11	0	1	6	0	0	6	7	318	
16:45:00	9	5	0	0	11	14	0	264	11	0	2	275	0	0	0	0	9	0	0	5	0	0	2	5	294	1170
17:00:00	5	8	1	0	4	14	1	272	12	0	4	285	0	0	0	0	4	0	0	9	0	0	1	9	308	1206
17:15:00	9	11	0	0	5	20	0	242	11	0	3	253	0	0	0	0	4	0	0	4	0	0	6	4	277	1197
17:30:00	7	6	0	0	9	13	0	229	9	0	5	238	0	0	0	0	3	0	0	6	0	0	1	6	257	1136
17:45:00	4	3	0	0	8	7	0	193	10	0	3	203	0	0	0	0	7	0	0	3	0	0	2	3	213	1055
18:00:00	4	5	0	0	8	9	1	223	9	0	3	233	0	0	0	0	2	0	0	4	0	0	1	4	246	993
18:15:00	3	0	0	0	3	3	0	205	5	0	1	210	0	0	0	0	6	0	0	2	0	0	1	2	215	931
18:30:00	2	1	0	0	7	3	0	188	6	0	1	194	2	0	0	0	2	2	0	3	0	0	3	3	202	876
18:45:00	3	3	0	0	3	6	0	160	5	0	0	165	0	0	0	0	9	0	0	5	0	0	3	5	176	839
Grand Total	107	100	3	0	150	210	4	5941	205	0	85	6150	3	0	0	0	144	3	1	81	0	0	55	82	6445	-
Approach%	51%	47.6%	1.4%	0%	-	-	0.1%	96.6%	3.3%	0%	-	-	100%	0%	0%	0%	-	-	1.2%	98.8%	0%	0%	-	-	-	-
Totals %	1.7%	1.6%	0%	0%	3.3%	0.1%	92.2%	3.2%	0%	95.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1.3%	0%	0%	1.3%	-	-	-
Heavy	1	4	0	0	-	0	276	2	0	-	0	0	0	0	0	0	-	-	0	0	0	0	-	-	-	-
Heavy %	0.9%	4%	0%	0%	-	0%	4.6%	1%	0%	-	0%	0%	0%	0%	0%	0%	-	-	0%	0%	0%	0%	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (16.98 °C)

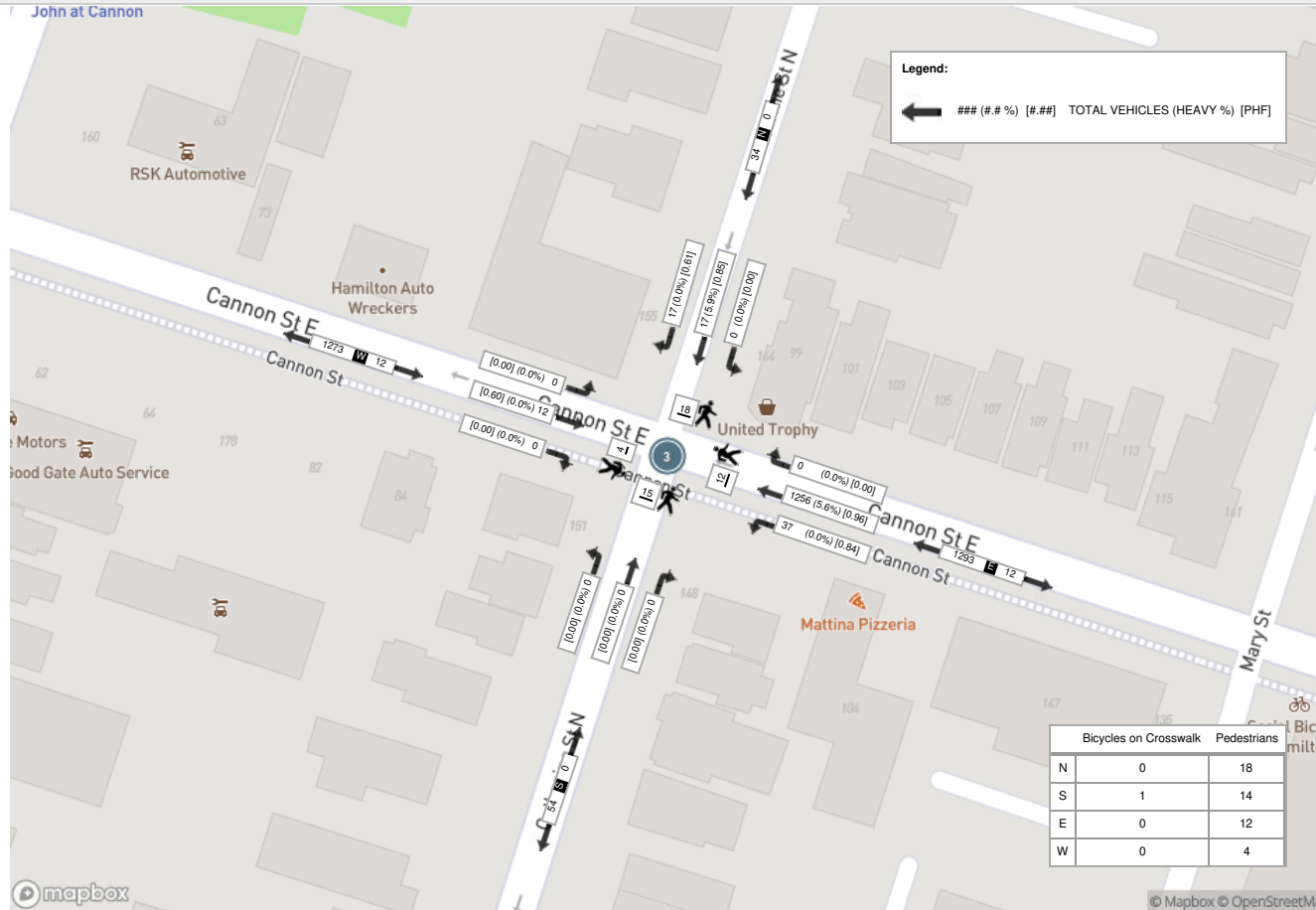
Start Time	N Approach CATHARINE ST						E Approach CANNON ST						S Approach CATHARINE ST						W Approach CANNON ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	3	3	0	0	2	6	0	303	8	0	2	311	0	0	0	0	0	0	0	4	0	0	0	4	321
07:45:00	1	5	0	0	4	6	0	305	9	0	4	314	0	0	0	0	2	0	0	2	0	0	1	2	322
08:00:00	6	5	0	0	3	11	0	321	9	0	3	330	0	0	0	0	6	0	0	5	0	0	0	5	346
08:15:00	7	4	0	0	9	11	0	327	11	0	3	338	0	0	0	0	7	0	0	1	0	0	3	1	350
Grand Total	17	17	0	0	18	34	0	1256	37	0	12	1293	0	0	0	0	15	0	0	12	0	0	4	12	1339
Approach%	50%	50%	0%	0%	-	-	0%	97.1%	2.9%	0%	-	-	0%	0%	0%	0%	-	0%	100%	0%	0%	-	-	-	-
Totals %	1.3%	1.3%	0%	0%	2.5%	2.5%	0%	93.8%	2.8%	0%	96.6%	96.6%	0%	0%	0%	0%	0%	0%	0.9%	0%	0%	0.9%	0.9%	0.9%	0.9%
PHF	0.61	0.85	0	0	0.77	0.77	0	0.96	0.84	0	0.96	0.96	0	0	0	0	0	0	0.6	0	0	0.6	0.6	0.6	0.6
Heavy	0	1	0	0	1	1	0	70	0	0	70	70	0	0	0	0	0	0	0	0	0	0	0	0	0
Heavy %	0%	5.9%	0%	0%	2.9%	2.9%	0%	5.6%	0%	0%	5.4%	5.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lights	17	16	0	0	33	33	0	1170	36	0	1206	1206	0	0	0	0	0	0	1	0	0	0	1	1	
Lights %	100%	94.1%	0%	0%	97.1%	97.1%	0%	93.2%	97.3%	0%	93.3%	93.3%	0%	0%	0%	0%	0%	0%	8.3%	0%	0%	0%	8.3%	8.3%	
Single-Unit Trucks	0	1	0	0	1	1	0	42	0	0	42	42	0	0	0	0	0	0	0	0	0	0	0	0	
Single-Unit Trucks %	0%	5.9%	0%	0%	2.9%	2.9%	0%	3.3%	0%	0%	3.2%	3.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Buses	0	0	0	0	0	0	0	10	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	
Buses %	0%	0%	0%	0%	0%	0%	0%	0.8%	0%	0%	0.8%	0.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Articulated Trucks	0	0	0	0	0	0	0	18	0	0	18	18	0	0	0	0	0	0	0	0	0	0	0	0	
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	1.4%	0%	0%	1.4%	1.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Bicycles on Road	0	0	0	0	0	0	0	16	1	0	17	17	0	0	0	0	0	0	11	0	0	0	11	11	
Bicycles on Road %	0%	0%	0%	0%	0%	0%	0%	1.3%	2.7%	0%	1.3%	1.3%	0%	0%	0%	0%	0%	0%	91.7%	0%	0%	0%	91.7%	91.7%	
Pedestrians	-	-	-	-	18	-	-	-	-	-	12	-	-	-	-	14	-	-	-	-	-	4	-	-	
Pedestrians %	-	-	-	-	36.7%	-	-	-	-	-	24.5%	-	-	-	-	28.6%	-	-	-	-	-	8.2%	-	-	
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	0	-	-	
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	2%	-	-	-	-	-	0%	-	-	



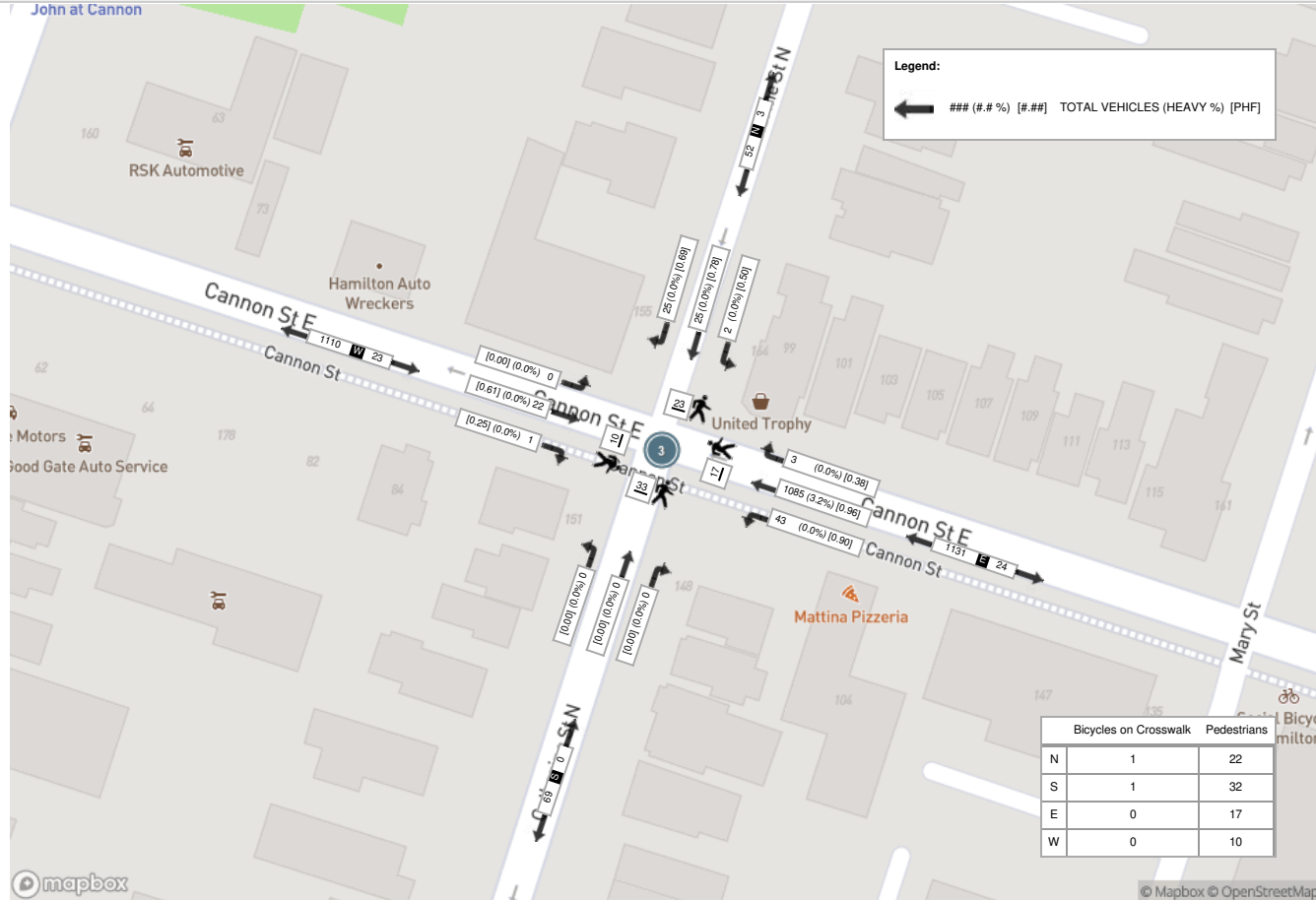
Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)

Start Time	N Approach CATHARINE ST						E Approach CANNON ST						S Approach CATHARINE ST						W Approach CANNON ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	3	8	0	0	2	11	0	265	8	0	7	273	0	0	0	0	9	0	0	2	0	0	1	2	286
16:30:00	8	4	1	0	6	13	2	284	12	0	4	298	0	0	0	0	11	0	1	6	0	0	6	7	318
16:45:00	9	5	0	0	11	14	0	264	11	0	2	275	0	0	0	0	9	0	0	5	0	0	2	5	294
17:00:00	5	8	1	0	4	14	1	272	12	0	4	285	0	0	0	0	4	0	0	9	0	0	1	9	308
Grand Total	25	25	2	0	23	52	3	1085	43	0	17	1131	0	0	0	0	33	0	1	22	0	0	10	23	1206
Approach%	48.1%	48.1%	3.8%	0%	-	-	0.3%	95.9%	3.8%	0%	-	-	0%	0%	0%	0%	-	4.3%	95.7%	0%	0%	-	-	-	
Totals %	2.1%	2.1%	0.2%	0%	4.3%	0.2%	0.2%	90%	3.6%	0%	93.8%	0%	0%	0%	0%	0%	0%	0.1%	1.8%	0%	0%	1.9%	-	-	
PHF	0.69	0.78	0.5	0	0.93	0.38	0.96	0.9	0	0.95	0	0	0	0	0	0	0	0.25	0.61	0	0	0.64	-	-	
Heavy	0	0	0	0	0	0	0	35	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Heavy %	0%	0%	0%	0%	0%	0%	0%	3.2%	0%	0%	3.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Lights	25	25	1	0	51	1	1031	43	0	1075	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Lights %	100%	100%	50%	0%	98.1%	33.3%	95%	100%	0%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Single-Unit Trucks	0	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	1.8%	0%	0%	1.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Buses	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Buses %	0%	0%	0%	0%	0%	0%	0%	0.6%	0%	0%	0.6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.8%	0%	0%	0.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	0	1	0	1	2	19	0	0	21	0	0	0	0	0	0	0	1	22	0	0	0	23	-	
Bicycles on Road %	0%	0%	50%	0%	1.9%	66.7%	1.8%	0%	0%	1.9%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	100%	-	
Pedestrians	-	-	-	-	22	-	-	-	-	17	-	-	-	-	32	-	-	-	-	-	10	-	-	-	
Pedestrians%	-	-	-	-	26.5%	-	-	-	-	20.5%	-	-	-	-	38.6%	-	-	-	-	-	12%	-	-	-	
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	0	-	-	-	
Bicycles on Crosswalk%	-	-	-	-	1.2%	-	-	-	-	0%	-	-	-	-	1.2%	-	-	-	-	-	0%	-	-	-	

Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (16.98 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)





Turning Movement Count (4 . CANNON ST E & HUGHSON ST N)

Start Time	N Approach HUGHSON STREET						E Approach CANNON STREET						S Approach HUGHSON STREET						W Approach CANNON STREET						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	3	0	0	0	1	3	1	304	1	0	2	306	0	3	1	0	2	4	0	0	0	0	0	0	313	
07:15:00	3	1	0	0	0	4	1	297	0	0	2	298	0	2	1	0	6	3	0	0	0	0	0	0	305	
07:30:00	6	1	0	0	2	7	1	328	2	0	4	331	0	7	0	0	0	7	0	0	0	0	0	0	345	
07:45:00	5	3	0	0	4	8	4	303	1	0	2	308	0	5	3	0	3	8	0	0	0	0	1	0	324	1287
08:00:00	0	0	1	0	0	1	3	329	1	0	1	333	0	4	0	0	1	4	0	1	0	0	1	1	339	1313
08:15:00	5	3	0	0	2	8	6	320	2	0	2	328	0	6	0	0	6	6	0	1	0	0	1	1	343	1351
08:30:00	1	8	0	0	6	9	4	275	2	0	4	281	0	3	1	0	7	4	1	0	0	0	0	1	295	1301
08:45:00	4	3	0	0	8	7	2	253	4	0	5	259	0	10	2	0	7	12	0	5	0	0	2	5	283	1260
09:00:00	4	6	0	0	7	10	7	228	5	0	1	240	0	3	1	0	7	4	0	4	0	0	0	4	258	1179
09:15:00	4	3	0	0	5	7	4	197	1	0	0	202	0	7	2	0	0	9	0	0	0	0	3	0	218	1054
09:30:00	1	3	0	0	2	4	4	194	4	0	3	202	0	5	3	0	6	8	0	1	0	0	3	1	215	974
09:45:00	1	7	0	0	7	8	1	167	1	0	2	169	0	6	3	0	14	9	0	2	0	0	0	2	188	879
BREAK																										
16:00:00	4	10	0	0	5	14	6	259	3	0	1	268	0	7	3	0	5	10	0	5	0	0	0	5	297	
16:15:00	8	6	0	0	10	14	3	275	6	0	6	284	0	5	5	0	5	10	0	3	0	0	9	3	311	
16:30:00	9	8	0	0	10	17	7	303	2	0	10	312	0	11	7	0	12	18	0	5	0	0	5	5	352	
16:45:00	2	7	0	0	14	9	3	273	4	0	14	280	0	8	7	0	3	15	0	4	0	0	3	4	308	1268
17:00:00	8	11	1	0	11	20	7	289	1	0	7	297	0	7	8	0	5	15	0	7	0	0	5	7	339	1310
17:15:00	6	11	0	0	13	17	3	255	5	0	9	263	0	6	9	0	7	15	0	3	0	0	6	3	298	1297
17:30:00	8	3	0	0	4	11	5	226	6	0	0	237	0	13	7	0	5	20	0	5	0	0	4	5	273	1218
17:45:00	4	10	0	0	13	14	6	189	6	0	8	201	2	18	11	0	4	31	0	0	0	0	8	0	246	1156
18:00:00	6	9	0	0	3	15	10	221	3	0	3	234	0	13	5	0	3	18	0	4	0	0	2	4	271	1088
18:15:00	9	6	0	0	10	15	8	198	2	0	9	208	0	8	4	0	4	12	0	1	0	0	2	1	236	1026
18:30:00	7	6	0	0	9	13	11	178	3	0	7	192	0	10	3	0	6	13	1	4	0	0	1	5	223	976
18:45:00	4	6	0	0	11	10	9	145	6	0	1	160	0	7	3	0	8	10	0	5	0	0	5	5	185	915
Grand Total	112	131	2	0	157	245	116	6006	71	0	103	6193	2	174	89	0	126	265	2	60	0	0	61	62	6765	-
Approach%	45.7%	53.5%	0.8%	0%	-	-	1.9%	97%	1.1%	0%	-	-	0.8%	65.7%	33.6%	0%	-	-	3.2%	96.8%	0%	0%	-	-	-	-
Totals %	1.7%	1.9%	0%	0%	3.6%	3.6%	1.7%	88.8%	1%	0%	91.5%	0%	0%	2.6%	1.3%	0%	3.9%	0%	0.9%	0%	0%	0.9%	0.9%	-	-	
Heavy	4	3	0	0	-	-	2	286	1	0	-	-	0	0	1	0	-	-	0	0	0	0	-	-	-	-
Heavy %	3.6%	2.3%	0%	0%	-	-	1.7%	4.8%	1.4%	0%	-	-	0%	0%	1.1%	0%	-	-	0%	0%	0%	0%	-	-	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (16.98 °C)

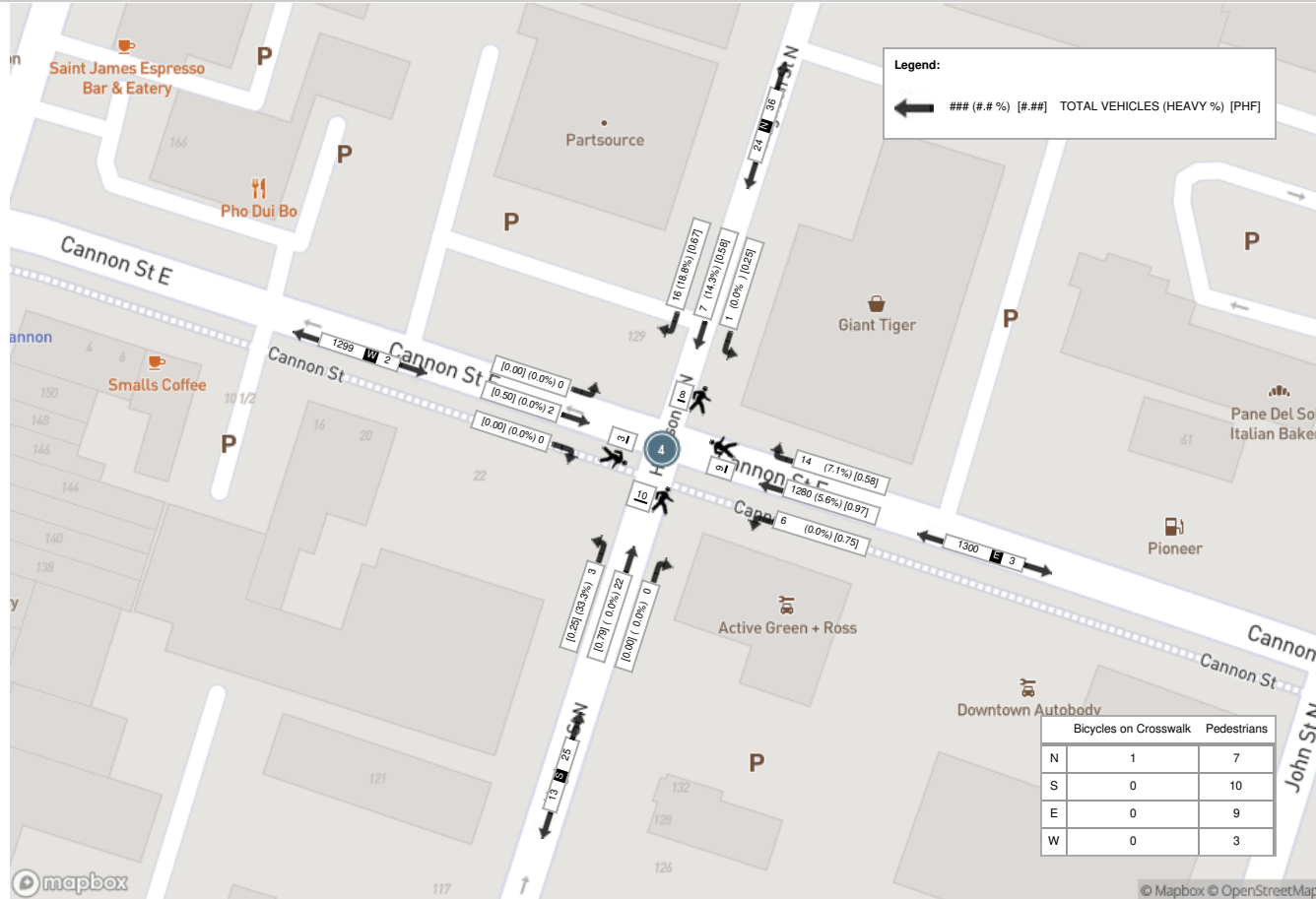
Start Time	N Approach HUGHSON STREET						E Approach CANNON STREET						S Approach HUGHSON STREET						W Approach CANNON STREET						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	6	1	0	0	2	7	1	328	2	0	4	331	0	7	0	0	0	7	0	0	0	0	0	0	345
07:45:00	5	3	0	0	4	8	4	303	1	0	2	308	0	5	3	0	3	8	0	0	0	0	1	0	324
08:00:00	0	0	1	0	0	1	3	329	1	0	1	333	0	4	0	0	1	4	0	1	0	0	1	1	339
08:15:00	5	3	0	0	2	8	6	320	2	0	2	328	0	6	0	0	6	6	0	1	0	0	1	1	343
Grand Total	16	7	1	0	8	24	14	1280	6	0	9	1300	0	22	3	0	10	25	0	2	0	0	3	2	1351
Approach%	66.7%	29.2%	4.2%	0%	-	-	1.1%	98.5%	0.5%	0%	-	0%	88%	12%	0%	-	0%	100%	0%	0%	-	-	-	-	-
Totals %	1.2%	0.5%	0.1%	0%	1.8%	1%	94.7%	0.4%	0%	96.2%	0%	1.6%	0.2%	0%	1.9%	0%	0.1%	0%	0%	0.1%	-	-	-	-	-
PHF	0.67	0.58	0.25	0	0.75	0.58	0.97	0.75	0	0.98	0	0.79	0.25	0	0.78	0	0.5	0	0	0.5	-	-	-	-	-
Heavy	3	1	0	0	4	1	72	0	0	73	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-
Heavy %	18.8%	14.3%	0%	0%	16.7%	7.1%	5.6%	0%	0%	5.6%	0%	0%	33.3%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Lights	13	5	0	0	18	13	1196	5	0	1214	0	19	2	0	21	0	0	0	0	0	0	0	0	0	-
Lights %	81.3%	71.4%	0%	0%	75%	92.9%	93.4%	83.3%	0%	93.4%	0%	86.4%	66.7%	0%	84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Single-Unit Trucks	2	0	0	0	2	1	44	0	0	45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	-
Single-Unit Trucks %	12.5%	0%	0%	0%	8.3%	7.1%	3.4%	0%	0%	3.5%	0%	0%	33.3%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Buses	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Buses %	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	1	1	0	0	2	0	19	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	6.3%	14.3%	0%	0%	8.3%	0%	1.5%	0%	0%	1.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	1	1	0	2	0	12	1	0	13	0	3	0	0	3	0	0	0	0	2	0	0	0	2	-
Bicycles on Road %	0%	14.3%	100%	0%	8.3%	0%	0.9%	16.7%	0%	1%	0%	13.6%	0%	0%	12%	0%	100%	0%	0%	100%	0%	0%	0%	100%	-
Pedestrians	-	-	-	-	7	-	-	-	-	9	-	-	-	-	10	-	-	-	-	3	-	-	-	-	-
Pedestrians%	-	-	-	-	23.3%	-	-	-	-	30%	-	-	-	-	33.3%	-	-	-	-	10%	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-
Bicycles on Crosswalk%	-	-	-	-	3.3%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-



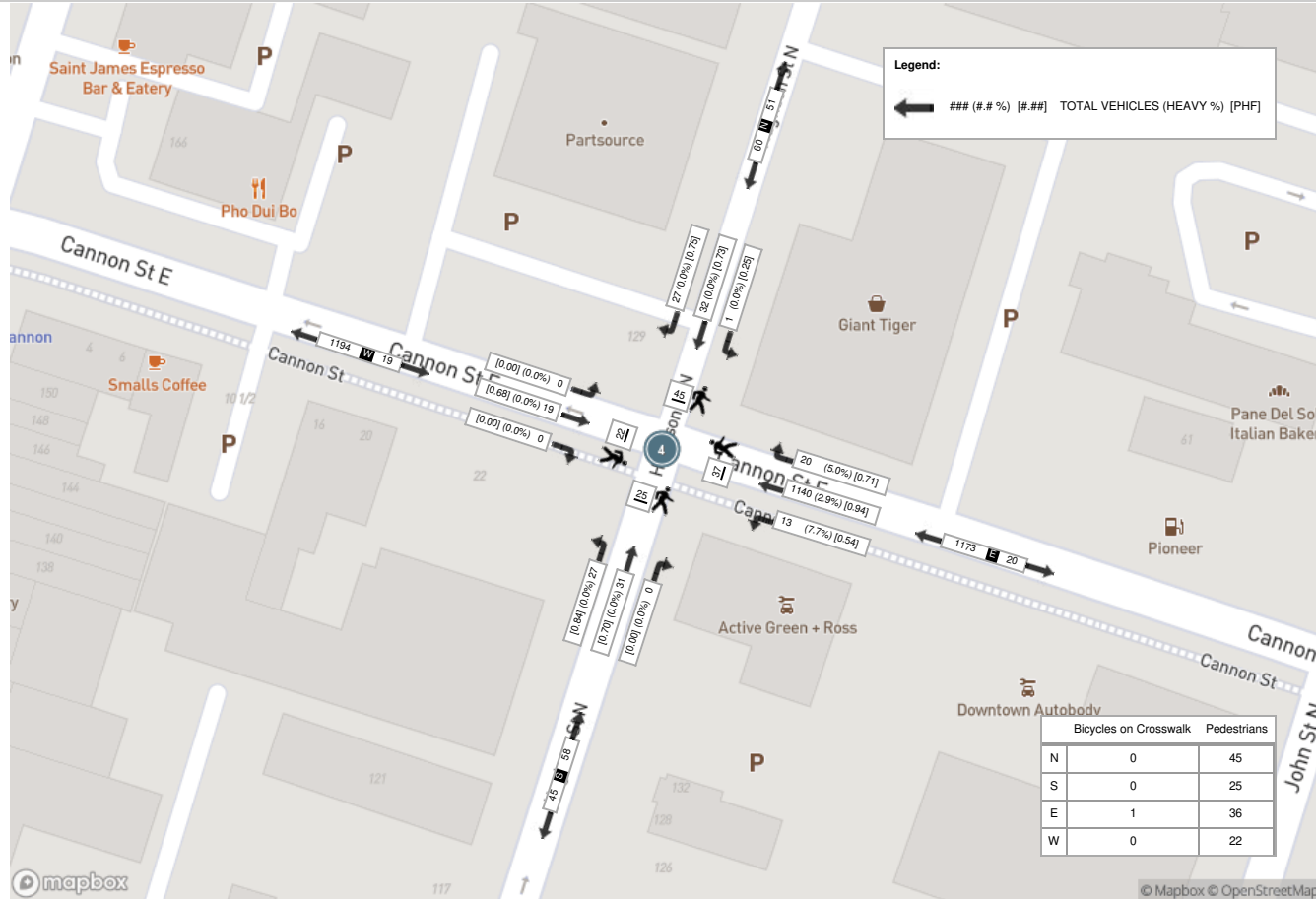
Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)

Start Time	N Approach HUGHSON STREET						E Approach CANNON STREET						S Approach HUGHSON STREET						W Approach CANNON STREET						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	8	6	0	0	10	14	3	275	6	0	6	284	0	5	5	0	5	10	0	3	0	0	9	3	311
16:30:00	9	8	0	0	10	17	7	303	2	0	10	312	0	11	7	0	12	18	0	5	0	0	5	5	352
16:45:00	2	7	0	0	14	9	3	273	4	0	14	280	0	8	7	0	3	15	0	4	0	0	3	4	308
17:00:00	8	11	1	0	11	20	7	289	1	0	7	297	0	7	8	0	5	15	0	7	0	0	5	7	339
Grand Total	27	32	1	0	45	60	20	1140	13	0	37	1173	0	31	27	0	25	58	0	19	0	0	22	19	1310
Approach%	45%	53.3%	1.7%	0%	-	-	1.7%	97.2%	1.1%	0%	-	-	0%	53.4%	46.6%	0%	-	-	0%	100%	0%	0%	-	-	-
Totals %	2.1%	2.4%	0.1%	0%	4.6%	4.6%	1.5%	87%	1%	0%	89.5%	4.6%	0%	2.4%	2.1%	0%	4.4%	4.4%	0%	1.5%	0%	0%	1.5%	1.5%	-
PHF	0.75	0.73	0.25	0	0.75	0.75	0.71	0.94	0.54	0	0.94	0.94	0	0.7	0.84	0	0.81	0.81	0	0.68	0	0	0.68	0.68	-
Heavy	0	0	0	0	0	0	1	33	1	0	35	35	0	0	0	0	0	0	0	0	0	0	0	0	-
Heavy %	0%	0%	0%	0%	0%	0%	5%	2.9%	7.7%	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Lights	27	31	0	0	58	58	19	1091	11	0	1121	1121	0	30	26	0	56	56	0	1	0	0	1	1	-
Lights %	100%	96.9%	0%	0%	96.7%	96.7%	95%	95.7%	84.6%	0%	95.6%	95.6%	0%	96.8%	96.3%	0%	96.6%	96.6%	0%	5.3%	0%	0%	5.3%	5.3%	-
Single-Unit Trucks	0	0	0	0	0	0	1	18	0	0	19	19	0	0	0	0	0	0	0	0	0	0	0	0	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	5%	1.6%	0%	0%	1.6%	1.6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Buses	0	0	0	0	0	0	0	6	1	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	-
Buses %	0%	0%	0%	0%	0%	0%	0%	0.5%	7.7%	0%	0.6%	0.6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	0	9	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.8%	0%	0%	0.8%	0.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	1	1	0	2	2	0	16	1	0	17	17	0	1	1	0	2	2	0	18	0	0	18	18	-
Bicycles on Road %	0%	3.1%	100%	0%	3.3%	3.3%	0%	1.4%	7.7%	0%	1.4%	1.4%	0%	3.2%	3.7%	0%	3.4%	3.4%	0%	94.7%	0%	0%	94.7%	94.7%	-
Pedestrians	-	-	-	-	45	45	-	-	-	-	36	36	-	-	-	-	25	25	-	-	-	-	22	22	-
Pedestrians %	-	-	-	-	34.9%	34.9%	-	-	-	-	27.9%	27.9%	-	-	-	-	19.4%	19.4%	-	-	-	-	17.1%	17.1%	-
Bicycles on Crosswalk	-	-	-	-	0	0	-	-	-	-	1	1	-	-	-	-	0	0	-	-	-	-	0	0	-
Bicycles on Crosswalk %	-	-	-	-	0%	0%	-	-	-	-	0.8%	0.8%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-

Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (16.98 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)





Turning Movement Count (1 . JOHN ST N & CANNON ST E)

Start Time	N Approach JOHN ST						E Approach CANNON ST E						S Approach JOHN ST						W Approach CANNON ST E						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	6	6	0	0	0	12	4	284	1	0	0	289	0	23	17	0	1	40	0	1	0	0	2	1	342	
07:15:00	7	7	0	0	1	14	4	283	3	0	5	290	0	27	20	0	4	47	0	2	0	0	1	2	353	
07:30:00	7	2	0	0	0	9	8	285	9	0	3	302	0	28	30	0	0	58	0	3	0	0	0	3	372	
07:45:00	4	7	0	0	4	11	2	288	8	0	3	298	1	38	18	0	2	57	0	3	0	0	4	3	369	1436
08:00:00	8	18	0	0	1	26	10	305	8	0	1	323	0	36	21	0	6	57	0	3	0	0	4	3	409	1503
08:15:00	6	16	0	0	10	22	12	302	16	0	3	330	0	44	18	0	5	62	0	1	0	0	1	1	415	1565
08:30:00	5	15	0	0	7	20	10	264	8	0	7	282	0	28	13	0	10	41	0	0	0	0	5	0	343	1536
08:45:00	6	25	0	0	12	31	10	233	12	0	6	255	0	35	18	0	8	53	0	5	0	0	5	5	344	1511
09:00:00	4	18	0	0	4	22	17	223	4	0	4	244	0	38	16	0	9	54	0	4	0	0	7	4	324	1426
09:15:00	3	17	0	0	6	20	12	189	8	0	4	209	0	24	13	0	2	37	0	0	0	0	3	0	266	1277
09:30:00	2	12	0	0	5	14	9	175	11	0	3	195	0	26	19	0	9	45	0	1	0	0	10	1	255	1189
09:45:00	9	18	0	0	8	27	9	158	7	0	2	174	0	33	15	0	7	48	1	1	0	0	8	2	251	1096
BREAK																										
16:00:00	16	24	0	0	5	40	5	231	10	0	5	246	0	43	32	0	6	75	0	5	0	0	2	5	366	
16:15:00	6	27	0	0	7	33	13	253	11	0	2	277	0	45	26	0	5	71	0	4	0	0	3	4	385	
16:30:00	9	15	0	0	6	24	11	264	10	0	6	285	0	48	33	0	15	81	0	6	0	0	6	6	396	
16:45:00	6	23	0	0	13	29	11	243	14	0	8	268	1	36	32	0	5	69	0	4	0	0	3	4	370	1517
17:00:00	6	23	0	0	7	29	12	250	14	0	14	276	0	38	34	0	8	72	0	8	0	0	10	8	385	1536
17:15:00	6	23	0	0	7	29	5	237	9	0	8	251	0	43	18	0	9	61	0	2	0	0	2	2	343	1494
17:30:00	7	17	0	0	2	24	15	213	9	0	4	237	0	45	23	0	8	68	0	6	0	0	6	6	335	1433
17:45:00	4	21	0	0	8	25	10	177	11	0	5	198	0	38	19	0	5	57	0	3	0	0	2	3	283	1346
18:00:00	10	25	0	0	6	35	15	200	10	0	4	225	0	36	29	0	2	65	0	4	0	0	0	4	329	1290
18:15:00	5	13	1	0	4	19	13	184	7	0	2	204	0	34	17	0	13	51	0	1	0	0	6	1	275	1222
18:30:00	4	17	0	0	9	21	11	174	7	0	6	192	0	39	13	0	4	52	0	4	0	0	2	4	269	1156
18:45:00	4	16	0	0	6	20	6	144	4	0	6	154	0	37	11	0	13	48	0	4	0	0	9	4	226	1099
Grand Total	150	405	1	0	138	556	234	5559	211	0	111	6004	2	862	505	0	156	1369	1	75	0	0	101	76	8005	-
Approach%	27%	72.8%	0.2%	0%	-	-	3.9%	92.6%	3.5%	0%	-	-	0.1%	63%	36.9%	0%	-	-	1.3%	98.7%	0%	0%	-	-	-	-
Totals %	1.9%	5.1%	0%	0%	6.9%	2.9%	69.4%	2.6%	0%	75%	0%	10.8%	6.3%	0%	17.1%	0%	0.9%	0%	0%	0.9%	-	-	0.9%	-	-	
Heavy	5	14	0	0	-	4	272	4	0	-	0	109	12	0	-	0	0	0	0	0	0	0	-	-	-	
Heavy %	3.3%	3.5%	0%	0%	-	1.7%	4.9%	1.9%	0%	-	0%	12.6%	2.4%	0%	-	0%	0%	0%	0%	0%	0%	0%	-	-	-	
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (16.98 °C)

Start Time	N Approach JOHN ST						E Approach CANNON ST E						S Approach JOHN ST						W Approach CANNON ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	7	2	0	0	0	9	8	285	9	0	3	302	0	28	30	0	0	58	0	3	0	0	0	3	372
07:45:00	4	7	0	0	4	11	2	288	8	0	3	298	1	38	18	0	2	57	0	3	0	0	4	3	369
08:00:00	8	18	0	0	1	26	10	305	8	0	1	323	0	36	21	0	6	57	0	3	0	0	4	3	409
08:15:00	6	16	0	0	10	22	12	302	16	0	3	330	0	44	18	0	5	62	0	1	0	0	1	1	415
Grand Total	25	43	0	0	15	68	32	1180	41	0	10	1253	1	146	87	0	13	234	0	10	0	0	9	10	1565
Approach%	36.8%	63.2%	0%	0%	-	-	2.6%	94.2%	3.3%	0%	-	-	0.4%	62.4%	37.2%	0%	-	-	0%	100%	0%	0%	-	-	-
Totals %	1.6%	2.7%	0%	0%	4.3%	4.3%	2%	75.4%	2.6%	0%	80.1%	80.1%	0.1%	9.3%	5.6%	0%	15%	15%	0%	0.6%	0%	0%	0.6%	0.6%	-
PHF	0.78	0.6	0	0	0.65	0.65	0.67	0.97	0.64	0	0.95	0.95	0.25	0.83	0.73	0	0.94	0.94	0	0.83	0	0	0.83	0.83	-
Heavy	1	5	0	0	6	6	0	68	2	0	70	70	0	19	1	0	20	20	0	0	0	0	0	0	-
Heavy %	4%	11.6%	0%	0%	8.8%	8.8%	0%	5.8%	4.9%	0%	5.6%	5.6%	0%	13%	1.1%	0%	8.5%	8.5%	0%	0%	0%	0%	0%	0%	-
Lights	24	37	0	0	61	61	32	1099	38	0	1169	1169	1	126	86	0	213	213	0	1	0	0	0	1	-
Lights %	96%	86%	0%	0%	89.7%	89.7%	100%	93.1%	92.7%	0%	93.3%	93.3%	100%	86.3%	98.9%	0%	91%	91%	0%	10%	0%	0%	0%	10%	-
Single-Unit Trucks	1	2	0	0	3	3	0	41	1	0	42	42	0	4	1	0	5	5	0	0	0	0	0	0	-
Single-Unit Trucks %	4%	4.7%	0%	0%	4.4%	4.4%	0%	3.5%	2.4%	0%	3.4%	3.4%	0%	2.7%	1.1%	0%	2.1%	2.1%	0%	0%	0%	0%	0%	0%	-
Buses	0	3	0	0	3	3	0	9	1	0	10	10	0	15	0	0	15	15	0	0	0	0	0	0	-
Buses %	0%	7%	0%	0%	4.4%	4.4%	0%	0.8%	2.4%	0%	0.8%	0.8%	0%	10.3%	0%	0%	6.4%	6.4%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	0	18	0	0	18	18	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	1.5%	0%	0%	1.4%	1.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	1	0	0	1	1	0	13	1	0	14	14	0	1	0	0	1	1	0	9	0	0	0	9	-
Bicycles on Road %	0%	2.3%	0%	0%	1.5%	1.5%	0%	1.1%	2.4%	0%	1.1%	1.1%	0%	0.7%	0%	0%	0.4%	0.4%	0%	90%	0%	0%	0%	90%	-
Pedestrians	-	-	-	-	15	-	-	-	-	-	7	-	-	-	-	-	11	-	-	-	-	-	7	-	-
Pedestrians %	-	-	-	-	31.9%	-	-	-	-	-	14.9%	-	-	-	-	-	23.4%	-	-	-	-	-	14.9%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	2	-	-
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	-	6.4%	-	-	-	-	-	4.3%	-	-	-	-	-	4.3%	-	-



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)

Start Time	N Approach JOHN ST						E Approach CANNON ST E						S Approach JOHN ST						W Approach CANNON ST E						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	6	27	0	0	7	33	13	253	11	0	2	277	0	45	26	0	5	71	0	4	0	0	3	4	385
16:30:00	9	15	0	0	6	24	11	264	10	0	6	285	0	48	33	0	15	81	0	6	0	0	6	6	396
16:45:00	6	23	0	0	13	29	11	243	14	0	8	268	1	36	32	0	5	69	0	4	0	0	3	4	370
17:00:00	6	23	0	0	7	29	12	250	14	0	14	276	0	38	34	0	8	72	0	8	0	0	10	8	385
Grand Total	27	88	0	0	33	115	47	1010	49	0	30	1106	1	167	125	0	33	293	0	22	0	0	22	22	1536
Approach%	23.5%	76.5%	0%	0%	-	-	4.2%	91.3%	4.4%	0%	-	-	0.3%	57%	42.7%	0%	-	0%	100%	0%	0%	-	-	-	-
Totals %	1.8%	5.7%	0%	0%	7.5%	7.5%	3.1%	65.8%	3.2%	0%	72%	72%	0.1%	10.9%	8.1%	0%	19.1%	0%	1.4%	0%	0%	1.4%	1.4%	-	-
PHF	0.75	0.81	0	0	0.87	0.87	0.9	0.96	0.88	0	0.97	0.97	0.25	0.87	0.92	0	0.9	0	0.69	0	0	0.69	0.69	-	-
Heavy	0	2	0	0	2	2	0	34	0	0	34	34	0	16	1	0	17	0	0	0	0	0	0	-	-
Heavy %	0%	2.3%	0%	0%	1.7%	1.7%	0%	3.4%	0%	0%	3.1%	3.1%	0%	9.6%	0.8%	0%	5.8%	0%	0%	0%	0%	0%	0%	-	-
Lights	27	85	0	0	112	112	47	966	49	0	1062	1062	0	149	123	0	272	0	0	0	0	0	0	-	-
Lights %	100%	96.6%	0%	0%	97.4%	97.4%	100%	95.6%	100%	0%	96%	96%	0%	89.2%	98.4%	0%	92.8%	0%	0%	0%	0%	0%	0%	-	-
Single-Unit Trucks	0	1	0	0	1	1	0	18	0	0	18	18	0	1	1	0	2	0	0	0	0	0	0	-	-
Single-Unit Trucks %	0%	1.1%	0%	0%	0.9%	0.9%	0%	1.8%	0%	0%	1.6%	1.6%	0%	0.6%	0.8%	0%	0.7%	0%	0%	0%	0%	0%	0%	-	-
Buses	0	1	0	0	1	1	0	7	0	0	7	7	0	15	0	0	15	0	0	0	0	0	0	-	-
Buses %	0%	1.1%	0%	0%	0.9%	0.9%	0%	0.7%	0%	0%	0.6%	0.6%	0%	9%	0%	0%	5.1%	0%	0%	0%	0%	0%	0%	-	-
Articulated Trucks	0	0	0	0	0	0	0	9	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	-	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.9%	0%	0%	0.8%	0.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-
Bicycles on Road	0	1	0	0	1	1	0	10	0	0	10	10	1	2	1	0	4	0	22	0	0	0	22	-	-
Bicycles on Road %	0%	1.1%	0%	0%	0.9%	0.9%	0%	1%	0%	0%	0.9%	0.9%	100%	1.2%	0.8%	0%	1.4%	0%	100%	0%	0%	0%	100%	-	-
Pedestrians	-	-	-	-	33	-	-	-	-	-	25	-	-	-	-	-	31	-	-	-	-	18	-	-	-
Pedestrians%	-	-	-	-	28%	-	-	-	-	-	21.2%	-	-	-	-	-	26.3%	-	-	-	-	15.3%	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	4	-	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	4.2%	-	-	-	-	-	1.7%	-	-	-	-	3.4%	-	-	-

Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (16.98 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)





Turning Movement Count (2 . JOHN ST N & ROBERT ST)

Start Time	N Approach JOHN ST N						E Approach ROBERT ST						S Approach JOHN ST N						W Approach ROBERT ST						Int. Total (15 min)	Int. Total (1 hr)	
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total			
07:00:00	0	10	1	0	1	11	0	0	0	0	2	0	1	24	0	0	0	25	3	0	1	0	0	4	40		
07:15:00	0	8	1	0	1	9	0	0	2	0	3	2	0	31	1	0	0	32	2	0	0	0	3	2	45		
07:30:00	0	8	0	0	4	8	1	0	0	0	1	1	2	34	0	0	1	36	0	2	0	1	0	3	48		
07:45:00	0	15	1	0	3	16	0	1	0	0	2	1	4	35	0	0	2	39	0	2	1	0	1	3	59	192	
08:00:00	1	26	0	0	0	27	1	0	0	0	2	1	4	38	0	0	2	42	3	4	2	0	0	9	79	231	
08:15:00	1	16	0	0	0	17	0	0	1	0	2	1	3	52	3	0	3	58	0	1	1	0	4	2	78	264	
08:30:00	1	17	1	1	2	20	1	0	2	0	4	3	1	33	2	0	17	36	5	0	3	0	11	8	67	283	
08:45:00	2	25	0	0	4	27	0	1	0	0	6	1	0	41	0	0	6	41	3	2	1	0	7	6	75	299	
09:00:00	1	19	1	0	2	21	2	0	0	0	6	2	0	53	1	0	5	54	4	1	0	0	7	5	82	302	
09:15:00	1	16	0	0	1	17	0	1	2	0	2	3	3	34	1	0	3	38	3	0	2	0	7	5	63	287	
09:30:00	0	14	0	1	3	15	1	0	0	0	3	1	3	33	0	0	0	36	3	3	1	0	5	7	59	279	
09:45:00	1	20	1	0	3	22	0	2	0	0	1	2	5	31	4	0	3	40	6	0	3	0	9	9	73	277	
BREAK																											
16:00:00	1	31	0	0	4	32	0	3	0	0	6	3	8	36	1	0	8	45	4	2	1	0	9	7	87		
16:15:00	0	31	2	0	2	33	2	3	2	0	4	7	7	50	0	0	8	57	0	2	0	0	2	2	99		
16:30:00	3	21	0	0	7	24	1	1	3	0	8	5	2	49	3	0	8	54	3	4	1	0	6	8	91		
16:45:00	0	29	1	0	3	30	0	2	0	0	4	2	3	46	2	0	3	51	5	4	0	0	10	9	92	369	
17:00:00	2	25	3	0	10	30	2	1	0	0	12	3	6	42	3	0	6	51	8	1	2	0	5	11	95	377	
17:15:00	0	23	1	0	9	24	0	1	0	0	3	1	6	41	0	0	10	47	1	3	2	0	9	6	78	356	
17:30:00	0	22	1	0	6	23	1	1	0	0	3	2	2	57	1	0	9	60	3	4	1	0	12	8	93	358	
17:45:00	1	20	0	0	5	21	2	1	0	0	12	3	3	43	1	0	11	47	4	1	1	0	8	6	77	343	
18:00:00	0	27	1	0	15	28	1	0	1	0	4	2	2	49	4	0	1	55	7	2	1	0	6	10	95	343	
18:15:00	0	17	1	0	9	18	1	1	0	0	3	2	1	44	0	0	5	45	4	1	4	0	6	9	74	339	
18:30:00	0	17	1	0	8	18	0	1	0	0	3	1	3	43	4	0	7	50	2	2	1	0	11	5	74	320	
18:45:00	2	18	1	0	1	21	0	0	0	0	7	0	2	34	3	0	7	39	3	3	2	0	8	8	68	311	
Grand Total	17	475	18	2	103	512	16	20	13	0	103	49	71	973	34	0	125	1078	76	44	31	1	146	152	1791	-	
Approach%	3.3%	92.8%	3.5%	0.4%	-	-	32.7%	40.8%	26.5%	0%	-	-	6.6%	90.3%	3.2%	0%	-	-	50%	28.9%	20.4%	0.7%	-	-	-	-	
Totals %	0.9%	26.5%	1%	0.1%	-	28.6%	0.9%	1.1%	0.7%	0%	-	2.7%	4%	54.3%	1.9%	0%	-	60.2%	4.2%	2.5%	1.7%	0.1%	-	8.5%	-	-	
Heavy	0	18	0	0	-	-	0	1	1	0	-	-	1	112	0	0	-	-	1	0	0	0	-	-	-	-	
Heavy %	0%	3.8%	0%	0%	-	-	0%	5%	7.7%	0%	-	-	1.4%	11.5%	0%	0%	-	-	1.3%	0%	0%	0%	-	-	-	-	
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 08:15 AM - 09:15 AM Weather: Scattered Clouds (16.98 °C)

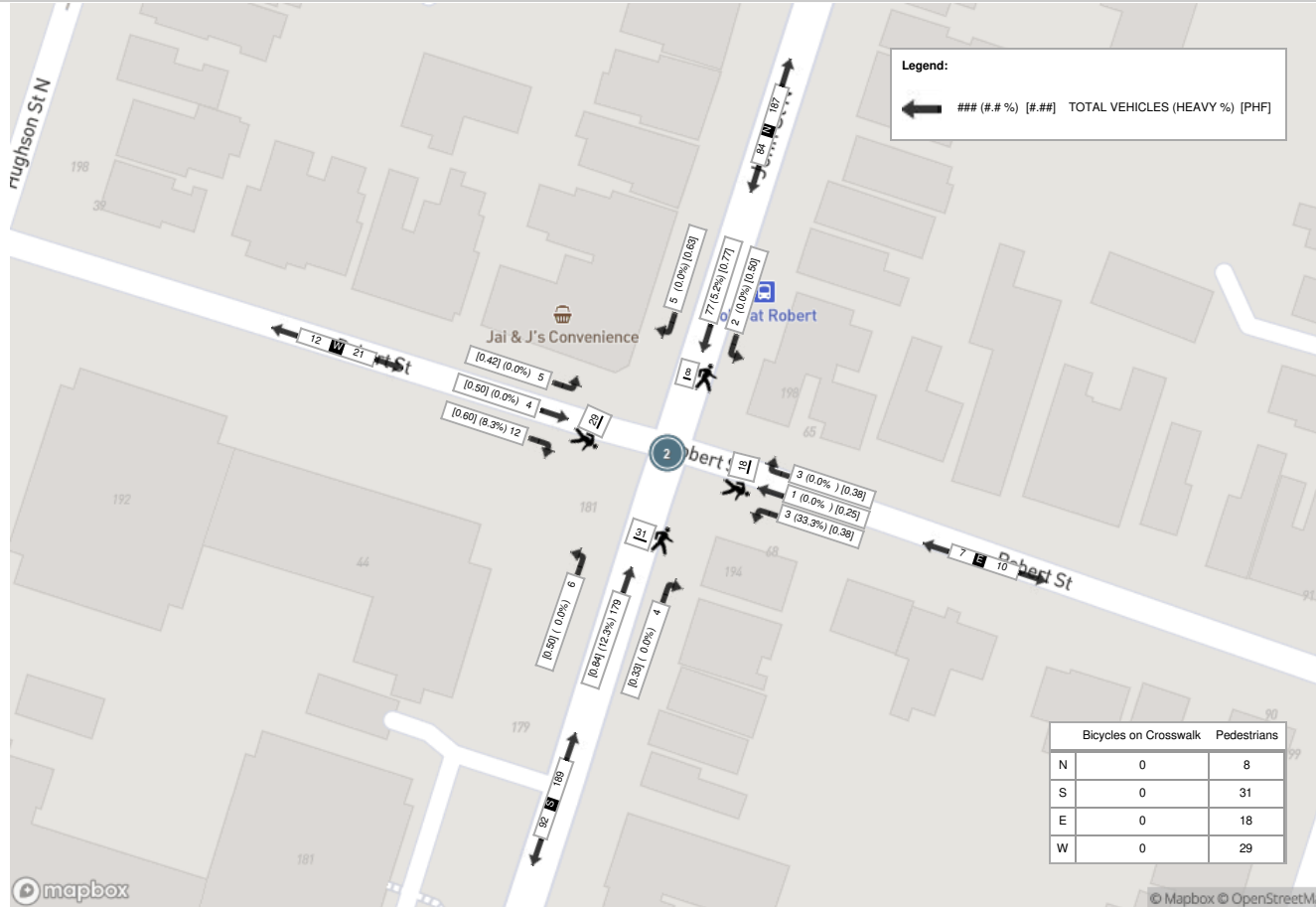
Start Time	N Approach JOHN ST N						E Approach ROBERT ST						S Approach JOHN ST N						W Approach ROBERT ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	1	16	0	0	0	17	0	0	1	0	2	1	3	52	3	0	3	58	0	1	1	0	4	2	78
08:30:00	1	17	1	1	2	20	1	0	2	0	4	3	1	33	2	0	17	36	5	0	3	0	11	8	67
08:45:00	2	25	0	0	4	27	0	1	0	0	6	1	0	41	0	0	6	41	3	2	1	0	7	6	75
09:00:00	1	19	1	0	2	21	2	0	0	0	6	2	0	53	1	0	5	54	4	1	0	0	7	5	82
Grand Total	5	77	2	1	8	85	3	1	3	0	18	7	4	179	6	0	31	189	12	4	5	0	29	21	302
Approach%	5.9%	90.6%	2.4%	1.2%	-	-	42.9%	14.3%	42.9%	0%	-	-	2.1%	94.7%	3.2%	0%	-	-	57.1%	19%	23.8%	0%	-	-	-
Totals %	1.7%	25.5%	0.7%	0.3%	28.1%	28.1%	1%	0.3%	1%	0%	2.3%	2.3%	1.3%	59.3%	2%	0%	62.6%	62.6%	4%	1.3%	1.7%	0%	7%	7%	-
PHF	0.63	0.77	0.5	0.25	0.79	0.79	0.38	0.25	0.38	0	0.58	0.58	0.33	0.84	0.5	0	0.81	0.81	0.6	0.5	0.42	0	0.66	0.66	-
Heavy	0	4	0	0	4	4	0	0	1	0	1	1	0	22	0	0	22	22	1	0	0	0	1	1	-
Heavy %	0%	5.2%	0%	0%	4.7%	4.7%	0%	0%	33.3%	0%	14.3%	14.3%	0%	12.3%	0%	0%	11.6%	11.6%	8.3%	0%	0%	0%	4.8%	4.8%	-
Lights	5	71	2	1	79	79	3	1	2	0	6	6	4	157	6	0	167	167	11	4	5	0	20	20	-
Lights %	100%	92.2%	100%	100%	92.9%	92.9%	100%	100%	66.7%	0%	85.7%	85.7%	100%	87.7%	100%	0%	88.4%	88.4%	91.7%	100%	100%	0%	95.2%	95.2%	-
Single-Unit Trucks	0	2	0	0	2	2	0	0	0	0	0	0	0	5	0	0	5	5	0	0	0	0	0	0	-
Single-Unit Trucks %	0%	2.6%	0%	0%	2.4%	2.4%	0%	0%	0%	0%	0%	0%	0%	2.8%	0%	0%	2.6%	2.6%	0%	0%	0%	0%	0%	0%	-
Buses	0	2	0	0	2	2	0	0	1	0	1	1	0	14	0	0	14	14	1	0	0	0	1	1	-
Buses %	0%	2.6%	0%	0%	2.4%	2.4%	0%	0%	33.3%	0%	14.3%	14.3%	0%	7.8%	0%	0%	7.4%	7.4%	8.3%	0%	0%	0%	4.8%	4.8%	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1.7%	0%	0%	1.6%	1.6%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Bicycles on Road %	0%	2.6%	0%	0%	2.4%	2.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	18	-	-	-	-	-	31	-	-	-	-	-	29	-	-
Pedestrians %	-	-	-	-	9.3%	-	-	-	-	-	20.9%	-	-	-	-	-	36%	-	-	-	-	-	33.7%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-



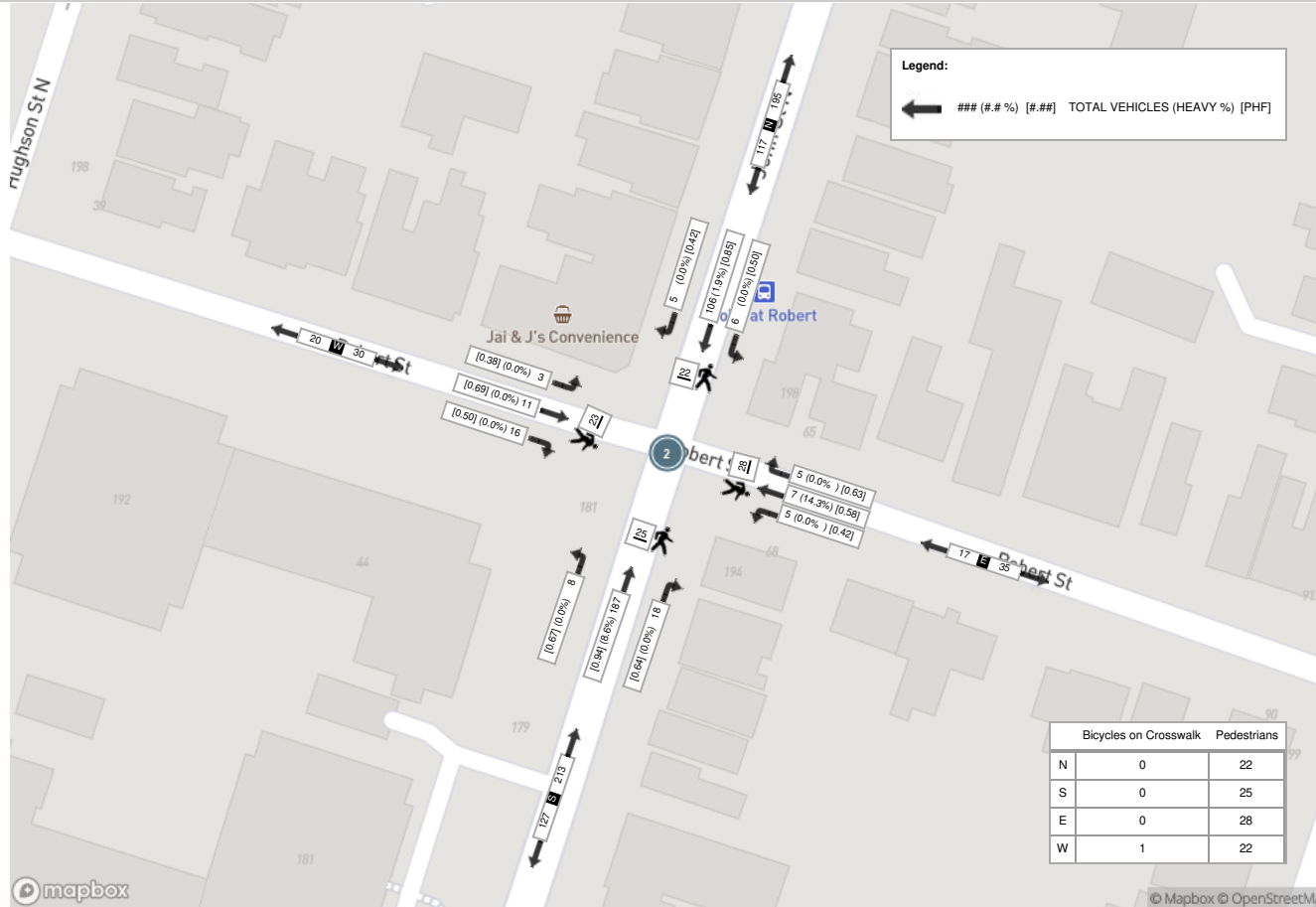
Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)

Start Time	N Approach JOHN ST N						E Approach ROBERT ST						S Approach JOHN ST N						W Approach ROBERT ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	0	31	2	0	2	33	2	3	2	0	4	7	7	50	0	0	8	57	0	2	0	0	2	2	99
16:30:00	3	21	0	0	7	24	1	1	3	0	8	5	2	49	3	0	8	54	3	4	1	0	6	8	91
16:45:00	0	29	1	0	3	30	0	2	0	0	4	2	3	46	2	0	3	51	5	4	0	0	10	9	92
17:00:00	2	25	3	0	10	30	2	1	0	0	12	3	6	42	3	0	6	51	8	1	2	0	5	11	95
Grand Total	5	106	6	0	22	117	5	7	5	0	28	17	18	187	8	0	25	213	16	11	3	0	23	30	377
Approach%	4.3%	90.6%	5.1%	0%	-	-	29.4%	41.2%	29.4%	0%	-	-	8.5%	87.8%	3.8%	0%	-	-	53.3%	36.7%	10%	0%	-	-	-
Totals %	1.3%	28.1%	1.6%	0%	31%	31%	1.3%	1.9%	1.3%	0%	4.5%	4.5%	4.8%	49.6%	2.1%	0%	56.5%	56.5%	4.2%	2.9%	0.8%	0%	8%	8%	-
PHF	0.42	0.85	0.5	0	0.89	0.89	0.63	0.58	0.42	0	0.61	0.61	0.64	0.94	0.67	0	0.93	0.93	0.5	0.69	0.38	0	0.68	0.68	-
Heavy	0	2	0	0	2	2	0	1	0	0	1	1	0	16	0	0	16	16	0	0	0	0	0	0	-
Heavy %	0%	1.9%	0%	0%	1.7%	1.7%	0%	14.3%	0%	0%	5.9%	5.9%	0%	8.6%	0%	0%	7.5%	7.5%	0%	0%	0%	0%	0%	0%	-
Lights	5	102	4	0	111	111	5	6	3	0	14	14	16	165	8	0	189	189	16	11	3	0	30	30	-
Lights %	100%	96.2%	66.7%	0%	94.9%	94.9%	100%	85.7%	60%	0%	82.4%	82.4%	88.9%	88.2%	100%	0%	88.7%	88.7%	100%	100%	100%	0%	100%	100%	-
Single-Unit Trucks	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	-
Single-Unit Trucks %	0%	0.9%	0%	0%	0.9%	0.9%	0%	0%	0%	0%	0%	0%	0%	0.5%	0%	0%	0.5%	0.5%	0%	0%	0%	0%	0%	0%	-
Buses	0	1	0	0	1	1	0	1	0	0	1	1	0	15	0	0	15	15	0	0	0	0	0	0	-
Buses %	0%	0.9%	0%	0%	0.9%	0.9%	0%	14.3%	0%	0%	5.9%	5.9%	0%	8%	0%	0%	7%	7%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	2	2	0	4	4	0	0	2	0	2	2	2	6	0	0	8	8	0	0	0	0	0	0	-
Bicycles on Road %	0%	1.9%	33.3%	0%	3.4%	3.4%	0%	0%	40%	0%	11.8%	11.8%	11.1%	3.2%	0%	0%	3.8%	3.8%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	22	-	-	-	-	-	28	-	-	-	-	-	25	-	-	-	-	-	22	-	-
Pedestrians %	-	-	-	-	22.4%	-	-	-	-	-	28.6%	-	-	-	-	-	25.5%	-	-	-	-	-	22.4%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	1%	-	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Scattered Clouds (16.98 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.54 °C)



















Appendix B

Existing Traffic Level of Service Calculations

Lanes, Volumes, Timings
3: John Street N & Cannon Street E

10-31-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	41	1180	32	87	146	0	0	43	25
Future Volume (vph)	0	0	0	41	1180	32	87	146	0	0	43	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4812	0	1767	1663	0	0	1625	0
Flt Permitted					0.998		0.711					
Satd. Flow (perm)	0	0	0	0	4808	0	1309	1663	0	0	1625	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7							26
Link Speed (k/h)		50			50			40				40
Link Distance (m)		112.4			115.4			83.7				182.0
Travel Time (s)		8.1			8.3			7.5				16.4
Confl. Peds. (#/hr)				13		15	9		10	10		9
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	6%	0%	1%	13%	0%	0%	12%	4%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1319	0	92	154	0	0	71	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.3	28.3		28.4	28.4				28.4
Total Split (s)				54.0	54.0		36.0	36.0				36.0
Total Split (%)				60.0%	60.0%		40.0%	40.0%				40.0%
Maximum Green (s)				48.7	48.7		30.6	30.6				30.6
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				2.0	2.0		2.1	2.1				2.1
Lost Time Adjust (s)					-1.0		-1.0	-1.0				-1.0
Total Lost Time (s)					4.3		4.4	4.4				4.4

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		12.0	12.0				12.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					49.7		31.6	31.6				31.6
Actuated g/C Ratio					0.55		0.35	0.35				0.35
v/c Ratio					0.50		0.20	0.26				0.12
Control Delay					11.3		21.9	22.4				14.4
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					11.4		21.9	22.4				14.4
LOS					B		C	C				B
Approach Delay					11.4			22.2				14.4
Approach LOS					B			C				B
Queue Length 50th (m)					50.9		11.5	19.8				5.4
Queue Length 95th (m)					62.9		23.2	35.1				14.7
Internal Link Dist (m)		88.4			91.4			59.7				158.0
Turn Bay Length (m)												
Base Capacity (vph)					2658		459	583				587
Starvation Cap Reductn					410		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.59		0.20	0.26				0.12

Intersection Summary


















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 44 (49%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 13.2 Intersection LOS: B
 Intersection Capacity Utilization 50.0% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 3: John Street N & Cannon Street E



Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

10-31-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	6	1280	14	3	22	0	0	7	16
Future Volume (vph)	0	0	0	6	1280	14	3	22	0	0	7	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4828	0	0	1796	0	0	1432	0
Flt Permitted								0.983				
Satd. Flow (perm)	0	0	0	0	4828	0	0	1776	0	0	1432	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3							16
Link Speed (k/h)		50			50			40				40
Link Distance (m)		55.1			112.4			118.4				114.0
Travel Time (s)		4.0			8.1			10.7				10.3
Confl. Peds. (#/hr)				10		8	3		9	9		3
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	7%	33%	0%	0%	0%	14%	19%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1326	0	0	25	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.0	28.0		24.7	24.7				24.7
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				54.0	54.0		25.3	25.3				25.3
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				1.7	1.7		2.4	2.4				2.4
Lost Time Adjust (s)					-1.0			-1.0				-1.0
Total Lost Time (s)					4.0			4.7				4.7

Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		8.0	8.0				8.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					55.0			26.3				26.3
Actuated g/C Ratio					0.61			0.29				0.29
v/c Ratio					0.45			0.05				0.05
Control Delay					2.6			23.3				13.7
Queue Delay					0.0			0.0				0.0
Total Delay					2.7			23.3				13.7
LOS					A			C				B
Approach Delay					2.7			23.3				13.7
Approach LOS					A			C				B
Queue Length 50th (m)					7.8			3.3				0.9
Queue Length 95th (m)					9.3			9.2				6.7
Internal Link Dist (m)		31.1			88.4			94.4				90.0
Turn Bay Length (m)												
Base Capacity (vph)					2951			518				429
Starvation Cap Reductn					257			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.49			0.05				0.05

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 49 (54%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 3.3 Intersection LOS: A
 Intersection Capacity Utilization 47.4% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Hughson Street N & Cannon Street E



Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑	
Traffic Volume (vph)	0	0	0	37	1256	0	0	0	0	0	17	17
Future Volume (vph)	0	0	0	37	1256	0	0	0	0	0	17	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4842	0	0	0	0	0	1686	0
Flt Permitted					0.999							
Satd. Flow (perm)	0	0	0	0	4838	0	0	0	0	0	1686	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					30							18
Link Speed (k/h)		50			50			40				40
Link Distance (m)		115.4			120.3			45.3				122.5
Travel Time (s)		8.3			8.7			4.1				11.0
Confl. Peds. (#/hr)				15		18	4		12	12		4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1347	0	0	0	0	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA							NA
Protected Phases					2							4
Permitted Phases				2								
Detector Phase				2	2							4
Switch Phase												
Minimum Initial (s)				10.0	10.0							10.0
Minimum Split (s)				31.2	31.2							28.5
Total Split (s)				58.0	58.0							32.0
Total Split (%)				64.4%	64.4%							35.6%
Maximum Green (s)				52.8	52.8							26.5
Yellow Time (s)				3.3	3.3							3.0
All-Red Time (s)				1.9	1.9							2.5
Lost Time Adjust (s)					-1.0							-1.0
Total Lost Time (s)					4.2							4.5

Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Minimum Gap (s)				3.0	3.0							3.0
Time Before Reduce (s)				0.0	0.0							0.0
Time To Reduce (s)				0.0	0.0							0.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				15.0	15.0							12.0
Flash Dont Walk (s)				7.0	7.0							9.0
Pedestrian Calls (#/hr)				0	0							0
Act Effct Green (s)					78.2							11.0
Actuated g/C Ratio					0.87							0.12
v/c Ratio					0.32							0.16
Control Delay					2.2							24.4
Queue Delay					0.0							0.0
Total Delay					2.2							24.4
LOS					A							C
Approach Delay					2.2							24.4
Approach LOS					A							C
Queue Length 50th (m)					20.2							3.0
Queue Length 95th (m)					24.9							11.9
Internal Link Dist (m)		91.4			96.3			21.3				98.5
Turn Bay Length (m)												
Base Capacity (vph)					4206							527
Starvation Cap Reductn					0							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.32							0.07

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	39 (43%), Referenced to phase 2:WBTL and 6:, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.32
Intersection Signal Delay:	2.8
Intersection LOS:	A
Intersection Capacity Utilization:	41.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: Catharine Street N & Cannon Street E



Lanes, Volumes, Timings
12: John Street N & Robert Street

10-31-2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	4	12	3	1	3	6	179	4	2	77	5
Future Volume (vph)	5	4	12	3	1	3	6	179	4	2	77	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1575	0	0	1485	0	0	1679	0	0	1774	0
Flt Permitted		0.964			0.937			0.992			0.994	
Satd. Flow (perm)	0	1531	0	0	1394	0	0	1666	0	0	1765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			4			3			6	
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		67.6			76.0			182.0			63.2	
Travel Time (s)		6.1			6.8			16.4			5.7	
Confl. Peds. (#/hr)	8		31	31		8	29		18	18		29
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	8%	33%	0%	0%	0%	12%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	9	0	0	233	0	0	103	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	15.8	15.8		15.8	15.8		28.8	28.8		28.8	28.8	
Total Split (s)	21.2	21.2		21.2	21.2		28.8	28.8		28.8	28.8	
Total Split (%)	42.4%	42.4%		42.4%	42.4%		57.6%	57.6%		57.6%	57.6%	
Maximum Green (s)	15.4	15.4		15.4	15.4		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.8			4.8			4.8			4.8	

Lanes, Volumes, Timings
 12: John Street N & Robert Street

10-31-2022

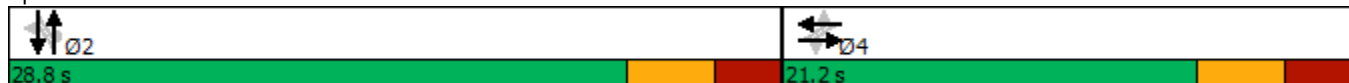


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)							12.0	12.0		12.0	12.0	
Flash Dont Walk (s)							10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		21.5			21.5			21.2			21.2	
Actuated g/C Ratio		0.48			0.48			0.47			0.47	
v/c Ratio		0.04			0.01			0.29			0.12	
Control Delay		7.3			8.6			9.4			7.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.3			8.6			9.4			7.8	
LOS		A			A			A			A	
Approach Delay		7.3			8.6			9.4			7.8	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.6			0.3			11.9			4.6	
Queue Length 95th (m)		3.7			2.1			20.7			9.8	
Internal Link Dist (m)		43.6			52.0			158.0			39.2	
Turn Bay Length (m)												
Base Capacity (vph)		741			670			903			958	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.04			0.01			0.26			0.11	

Intersection Summary



















Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 44.8
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.29
 Intersection Signal Delay: 8.8
 Intersection Capacity Utilization 34.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 12: John Street N & Robert Street



Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

10-31-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	49	1010	47	125	167	0	0	88	27
Future Volume (vph)	0	0	0	49	1010	47	125	167	0	0	88	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4935	0	1767	1708	0	0	1775	0
Flt Permitted					0.998		0.678					
Satd. Flow (perm)	0	0	0	0	4921	0	1232	1708	0	0	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13							17
Link Speed (k/h)		50			50			40				40
Link Distance (m)		112.4			115.4			83.7				182.0
Travel Time (s)		8.1			8.3			7.5				16.4
Confl. Peds. (#/hr)				33		33	22		30	30		22
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	1%	10%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1140	0	129	172	0	0	119	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.3	28.3		28.4	28.4				28.4
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				53.7	53.7		25.6	25.6				25.6
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				2.0	2.0		2.1	2.1				2.1
Lost Time Adjust (s)					-1.0		-1.0	-1.0				-1.0
Total Lost Time (s)					4.3		4.4	4.4				4.4

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		12.0	12.0				12.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					54.7		26.6	26.6				26.6
Actuated g/C Ratio					0.61		0.30	0.30				0.30
v/c Ratio					0.38		0.35	0.34				0.22
Control Delay					7.7		28.4	27.2				21.7
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					7.8		28.4	27.2				21.7
LOS					A		C	C				C
Approach Delay					7.8			27.7				21.7
Approach LOS					A			C				C
Queue Length 50th (m)					35.5		18.4	24.4				13.8
Queue Length 95th (m)					44.6		34.6	42.2				27.5
Internal Link Dist (m)		88.4			91.4			59.7				158.0
Turn Bay Length (m)												
Base Capacity (vph)					2995		364	504				536
Starvation Cap Reductn					702		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.50		0.35	0.34				0.22

Intersection Summary


















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 74 (82%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.38
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 47.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 3: John Street N & Cannon Street E



Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

10-31-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	13	1140	20	27	31	0	0	32	27
Future Volume (vph)	0	0	0	13	1140	20	27	31	0	0	32	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4947	0	0	1836	0	0	1726	0
Flt Permitted					0.999			0.873				
Satd. Flow (perm)	0	0	0	0	4944	0	0	1617	0	0	1726	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5							29
Link Speed (k/h)		50			50			40				40
Link Distance (m)		55.1			112.4			118.4				114.0
Travel Time (s)		4.0			8.1			10.7				10.3
Confl. Peds. (#/hr)				25		45	22		37	37		22
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	8%	3%	5%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1248	0	0	62	0	0	63	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.0	28.0		24.7	24.7				24.7
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				54.0	54.0		25.3	25.3				25.3
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				1.7	1.7		2.4	2.4				2.4
Lost Time Adjust (s)					-1.0			-1.0				-1.0
Total Lost Time (s)					4.0			4.7				4.7

Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		8.0	8.0				8.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					55.0			26.3				26.3
Actuated g/C Ratio					0.61			0.29				0.29
v/c Ratio					0.41			0.13				0.12
Control Delay					4.8			24.5				15.4
Queue Delay					0.1			0.0				0.0
Total Delay					4.9			24.5				15.4
LOS					A			C				B
Approach Delay					4.9			24.5				15.4
Approach LOS					A			C				B
Queue Length 50th (m)					14.3			8.3				4.5
Queue Length 95th (m)					16.7			18.1				13.9
Internal Link Dist (m)			31.1		88.4			94.4				90.0
Turn Bay Length (m)												
Base Capacity (vph)					3023			472				524
Starvation Cap Reductn					508			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.50			0.13				0.12

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	80 (89%), Referenced to phase 2:WBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	6.3
Intersection LOS:	A
Intersection Capacity Utilization:	45.0%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 6: Hughson Street N & Cannon Street E



Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑	
Traffic Volume (vph)	0	0	0	43	1085	0	0	0	0	0	25	25
Future Volume (vph)	0	0	0	43	1085	0	0	0	0	0	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4976	0	0	0	0	0	1730	0
Flt Permitted					0.998							
Satd. Flow (perm)	0	0	0	0	4963	0	0	0	0	0	1730	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					30							26
Link Speed (k/h)		50			50			40				40
Link Distance (m)		115.4			120.3			45.3				122.5
Travel Time (s)		8.3			8.7			4.1				11.0
Confl. Peds. (#/hr)				33		23	10		17	17		10
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1187	0	0	0	0	0	52	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA							NA
Protected Phases					2							4
Permitted Phases				2								
Detector Phase				2	2							4
Switch Phase												
Minimum Initial (s)				10.0	10.0							10.0
Minimum Split (s)				31.2	31.2							28.5
Total Split (s)				57.0	57.0							33.0
Total Split (%)				63.3%	63.3%							36.7%
Maximum Green (s)				51.8	51.8							27.5
Yellow Time (s)				3.3	3.3							3.0
All-Red Time (s)				1.9	1.9							2.5
Lost Time Adjust (s)					-1.0							-1.0
Total Lost Time (s)					4.2							4.5

Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

10-31-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Minimum Gap (s)				3.0	3.0							3.0
Time Before Reduce (s)				0.0	0.0							0.0
Time To Reduce (s)				0.0	0.0							0.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				15.0	15.0							12.0
Flash Dont Walk (s)				7.0	7.0							9.0
Pedestrian Calls (#/hr)				0	0							0
Act Effct Green (s)					78.2							11.0
Actuated g/C Ratio					0.87							0.12
v/c Ratio					0.28							0.22
Control Delay					2.1							24.1
Queue Delay					0.0							0.0
Total Delay					2.1							24.1
LOS					A							C
Approach Delay					2.1							24.1
Approach LOS					A							C
Queue Length 50th (m)					16.9							4.3
Queue Length 95th (m)					20.9							15.0
Internal Link Dist (m)		91.4			96.3			21.3				98.5
Turn Bay Length (m)												
Base Capacity (vph)					4315							565
Starvation Cap Reductn					0							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.28							0.09

















Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	69 (77%), Referenced to phase 2:WBTL and 6:, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.28
Intersection Signal Delay:	3.0
Intersection LOS:	A
Intersection Capacity Utilization:	40.0%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: Catharine Street N & Cannon Street E



Lanes, Volumes, Timings
 12: John Street N & Robert Street

10-31-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	11	16	5	7	5	8	187	18	6	106	5
Future Volume (vph)	3	11	16	5	7	5	8	187	18	6	106	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1682	0	0	1653	0	0	1711	0	0	1829	0
Flt Permitted		0.986			0.956			0.988			0.983	
Satd. Flow (perm)	0	1662	0	0	1587	0	0	1693	0	0	1800	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			5			13			5	
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		67.6			76.0			182.0			63.2	
Travel Time (s)		6.1			6.8			16.4			5.7	
Confl. Peds. (#/hr)	22		25	25		22	23		28	28		23
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	14%	0%	0%	9%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	18	0	0	229	0	0	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	15.8	15.8		15.8	15.8		28.8	28.8		28.8	28.8	
Total Split (s)	21.2	21.2		21.2	21.2		28.8	28.8		28.8	28.8	
Total Split (%)	42.4%	42.4%		42.4%	42.4%		57.6%	57.6%		57.6%	57.6%	
Maximum Green (s)	15.4	15.4		15.4	15.4		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.8			4.8			4.8			4.8	

Lanes, Volumes, Timings
 12: John Street N & Robert Street

10-31-2022

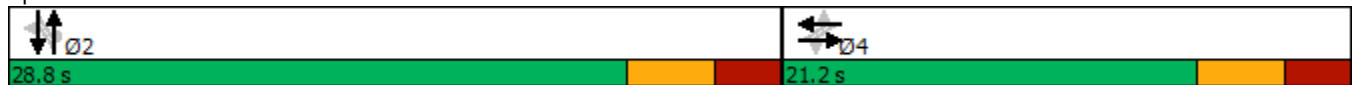


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)							12.0	12.0		12.0	12.0	
Flash Dont Walk (s)							10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		21.5			21.5			21.2			21.2	
Actuated g/C Ratio		0.48			0.48			0.47			0.47	
v/c Ratio		0.04			0.02			0.28			0.15	
Control Delay		7.3			9.1			8.9			8.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.3			9.1			8.9			8.1	
LOS		A			A			A			A	
Approach Delay		7.3			9.1			8.9			8.1	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.8			0.7			11.0			5.7	
Queue Length 95th (m)		4.9			3.8			22.4			13.0	
Internal Link Dist (m)		43.6			52.0			158.0			39.2	
Turn Bay Length (m)												
Base Capacity (vph)		805			763			921			976	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.04			0.02			0.25			0.13	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 44.8
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.28
 Intersection Signal Delay: 8.6
 Intersection Capacity Utilization 34.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 12: John Street N & Robert Street



Appendix C

Background Developments

41 Wilson Street

ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	908	Average Trip Rates (No equation given)	0.08	0.15	0.23	0.15	0.11	0.26
		Total Trips	73	136	209	136	100	236

80 John Street N

ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	700	Average Trip Rates (No equation given)	0.08	0.15	0.23	0.15	0.11	0.26
		Total Trips	56	105	161	105	77	182

71 Rebecca Street

ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	477	Average Trip Rates (No equation given)	0.08	0.15	0.23	0.15	0.11	0.26
		Total Trips	38	72	110	72	52	124

Appendix D

Future Background Level of Service Calculations

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	63	1278	35	123	219	0	0	82	27
Future Volume (vph)	0	0	0	63	1278	35	123	219	0	0	82	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4813	0	1767	1663	0	0	1642	0
Flt Permitted					0.998		0.684					
Satd. Flow (perm)	0	0	0	0	4807	0	1260	1663	0	0	1642	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7						20	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		112.4			115.4			83.7			182.0	
Travel Time (s)		8.1			8.3			7.5			16.4	
Confl. Peds. (#/hr)				13		15	9		10	10		9
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	6%	0%	1%	13%	0%	0%	12%	4%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1448	0	129	231	0	0	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					2			4			4	
Permitted Phases				2			4					
Detector Phase				2	2		4	4			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0			10.0	
Minimum Split (s)				28.3	28.3		28.4	28.4			28.4	
Total Split (s)				54.0	54.0		36.0	36.0			36.0	
Total Split (%)				60.0%	60.0%		40.0%	40.0%			40.0%	
Maximum Green (s)				48.7	48.7		30.6	30.6			30.6	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.0	2.0		2.1	2.1			2.1	
Lost Time Adjust (s)					-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)					4.3		4.4	4.4			4.4	

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		12.0	12.0				12.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					49.7		31.6	31.6				31.6
Actuated g/C Ratio					0.55		0.35	0.35				0.35
v/c Ratio					0.54		0.29	0.40				0.19
Control Delay					11.8		23.4	24.5				17.7
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					12.0		23.4	24.5				17.7
LOS					B		C	C				B
Approach Delay					12.0			24.1				17.7
Approach LOS					B			C				B
Queue Length 50th (m)					57.9		16.7	31.2				11.6
Queue Length 95th (m)					71.2		31.4	51.6				24.0
Internal Link Dist (m)		88.4			91.4			59.7				158.0
Turn Bay Length (m)												
Base Capacity (vph)					2657		442	583				589
Starvation Cap Reductn					319		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.62		0.29	0.40				0.19

Intersection Summary


















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 44 (49%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 14.6 Intersection LOS: B
 Intersection Capacity Utilization 52.4% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 3: John Street N & Cannon Street E



Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	6	1415	15	3	24	0	0	8	17
Future Volume (vph)	0	0	0	6	1415	15	3	24	0	0	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4828	0	0	1802	0	0	1437	0
Flt Permitted								0.984				
Satd. Flow (perm)	0	0	0	0	4828	0	0	1783	0	0	1437	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3							17
Link Speed (k/h)		50			50			40				40
Link Distance (m)		55.1			112.4			118.4				114.0
Travel Time (s)		4.0			8.1			10.7				10.3
Confl. Peds. (#/hr)				10		8	3		9	9		3
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	7%	33%	0%	0%	0%	14%	19%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1465	0	0	27	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.0	28.0		24.7	24.7				24.7
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				54.0	54.0		25.3	25.3				25.3
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				1.7	1.7		2.4	2.4				2.4
Lost Time Adjust (s)					-1.0			-1.0				-1.0
Total Lost Time (s)					4.0			4.7				4.7

Lanes, Volumes, Timings

6: Hughson Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		8.0	8.0				8.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					55.0			26.3				26.3
Actuated g/C Ratio					0.61			0.29				0.29
v/c Ratio					0.50			0.05				0.06
Control Delay					3.2			23.3				13.7
Queue Delay					0.1			0.0				0.0
Total Delay					3.3			23.3				13.7
LOS					A			C				B
Approach Delay					3.3			23.3				13.7
Approach LOS					A			C				B
Queue Length 50th (m)					10.8			3.5				1.0
Queue Length 95th (m)					12.6			9.8				6.9
Internal Link Dist (m)			31.1		88.4			94.4				90.0
Turn Bay Length (m)												
Base Capacity (vph)					2951			521				431
Starvation Cap Reductn					265			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.55			0.05				0.06

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	49 (54%), Referenced to phase 2:WBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	3.8
Intersection LOS:	A
Intersection Capacity Utilization:	50.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 6: Hughson Street N & Cannon Street E



Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑	
Traffic Volume (vph)	0	0	0	40	1379	0	0	0	0	0	18	18
Future Volume (vph)	0	0	0	40	1379	0	0	0	0	0	18	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4842	0	0	0	0	0	1686	0
Flt Permitted					0.999							
Satd. Flow (perm)	0	0	0	0	4838	0	0	0	0	0	1686	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					30						19	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		115.4			120.3			45.3			122.5	
Travel Time (s)		8.3			8.7			4.1			11.0	
Confl. Peds. (#/hr)				15		18	4		12	12		4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1478	0	0	0	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA							NA
Protected Phases					2							4
Permitted Phases				2								
Detector Phase				2	2							4
Switch Phase												
Minimum Initial (s)				10.0	10.0						10.0	
Minimum Split (s)				31.2	31.2						28.5	
Total Split (s)				58.0	58.0						32.0	
Total Split (%)				64.4%	64.4%						35.6%	
Maximum Green (s)				52.8	52.8						26.5	
Yellow Time (s)				3.3	3.3						3.0	
All-Red Time (s)				1.9	1.9						2.5	
Lost Time Adjust (s)					-1.0						-1.0	
Total Lost Time (s)					4.2						4.5	

Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Minimum Gap (s)				3.0	3.0							3.0
Time Before Reduce (s)				0.0	0.0							0.0
Time To Reduce (s)				0.0	0.0							0.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				15.0	15.0							12.0
Flash Dont Walk (s)				7.0	7.0							9.0
Pedestrian Calls (#/hr)				0	0							0
Act Effct Green (s)					78.2							11.0
Actuated g/C Ratio					0.87							0.12
v/c Ratio					0.35							0.17
Control Delay					2.3							24.2
Queue Delay					0.0							0.0
Total Delay					2.3							24.2
LOS					A							C
Approach Delay					2.3							24.2
Approach LOS					A							C
Queue Length 50th (m)					23.0							3.1
Queue Length 95th (m)					28.2							12.4
Internal Link Dist (m)		91.4			96.3			21.3				98.5
Turn Bay Length (m)												
Base Capacity (vph)					4206							528
Starvation Cap Reductn					0							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.35							0.07

Intersection Summary

















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 39 (43%), Referenced to phase 2:WBTL and 6:, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 2.9 Intersection LOS: A
 Intersection Capacity Utilization 44.2% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 9: Catharine Street N & Cannon Street E



Lanes, Volumes, Timings
12: John Street N & Robert Street

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	4	13	3	1	3	6	255	4	2	118	5
Future Volume (vph)	5	4	13	3	1	3	6	255	4	2	118	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1568	0	0	1485	0	0	1678	0	0	1779	0
Flt Permitted		0.960			0.926			0.994			0.996	
Satd. Flow (perm)	0	1518	0	0	1378	0	0	1669	0	0	1774	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			4			2			6	
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		67.6			76.0			182.0			63.2	
Travel Time (s)		6.1			6.8			16.4			5.7	
Confl. Peds. (#/hr)	8		31	31		8	29		18	18		29
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	8%	33%	0%	0%	0%	12%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	9	0	0	327	0	0	154	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	15.8	15.8		15.8	15.8		28.8	28.8		28.8	28.8	
Total Split (s)	21.2	21.2		21.2	21.2		28.8	28.8		28.8	28.8	
Total Split (%)	42.4%	42.4%		42.4%	42.4%		57.6%	57.6%		57.6%	57.6%	
Maximum Green (s)	15.4	15.4		15.4	15.4		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.8			4.8			4.8			4.8	

Lanes, Volumes, Timings
 12: John Street N & Robert Street

11-21-2024

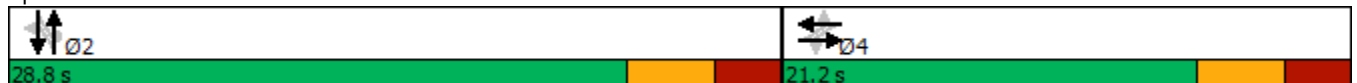


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)							12.0	12.0		12.0	12.0	
Flash Dont Walk (s)							10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		16.4			16.4			21.0			21.0	
Actuated g/C Ratio		0.35			0.35			0.45			0.45	
v/c Ratio		0.05			0.02			0.44			0.19	
Control Delay		7.3			8.6			11.2			8.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.3			8.6			11.2			8.4	
LOS		A			A			B			A	
Approach Delay		7.3			8.6			11.2			8.4	
Approach LOS		A			A			B			A	
Queue Length 50th (m)		0.6			0.3			17.9			7.2	
Queue Length 95th (m)		3.8			2.1			29.3			13.8	
Internal Link Dist (m)		43.6			52.0			158.0			39.2	
Turn Bay Length (m)												
Base Capacity (vph)		540			483			853			908	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.05			0.02			0.38			0.17	

Intersection Summary



















Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 47
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.44
 Intersection Signal Delay: 10.1 Intersection LOS: B
 Intersection Capacity Utilization 34.0% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 12: John Street N & Robert Street



Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	85	1094	51	159	226	0	0	158	29
Future Volume (vph)	0	0	0	85	1094	51	159	226	0	0	158	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4934	0	1767	1708	0	0	1798	0
Flt Permitted					0.997		0.559					
Satd. Flow (perm)	0	0	0	0	4912	0	1020	1708	0	0	1798	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13							10
Link Speed (k/h)		50			50			40				40
Link Distance (m)		112.4			115.4			83.7				182.0
Travel Time (s)		8.1			8.3			7.5				16.4
Confl. Peds. (#/hr)				33		33	22		30	30		22
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	1%	10%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1269	0	164	233	0	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5				3.5
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.3	28.3		28.4	28.4				28.4
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				53.7	53.7		25.6	25.6				25.6
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				2.0	2.0		2.1	2.1				2.1
Lost Time Adjust (s)					-1.0		-1.0	-1.0				-1.0
Total Lost Time (s)					4.3		4.4	4.4				4.4

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		12.0	12.0				12.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					54.7		26.6	26.6				26.6
Actuated g/C Ratio					0.61		0.30	0.30				0.30
v/c Ratio					0.42		0.54	0.46				0.36
Control Delay					7.6		34.7	29.5				26.0
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					7.7		34.7	29.5				26.0
LOS					A		C	C				C
Approach Delay					7.7			31.6				26.0
Approach LOS					A			C				C
Queue Length 50th (m)					41.0		25.0	34.5				26.0
Queue Length 95th (m)					51.2		46.1	56.8				45.0
Internal Link Dist (m)		88.4			91.4			59.7				158.0
Turn Bay Length (m)												
Base Capacity (vph)					2990		301	504				538
Starvation Cap Reductn					586		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.53		0.54	0.46				0.36

Intersection Summary


















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 74 (82%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 14.7
 Intersection Capacity Utilization 62.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: John Street N & Cannon Street E



Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	14	1258	22	29	34	0	0	35	29
Future Volume (vph)	0	0	0	14	1258	22	29	34	0	0	35	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4947	0	0	1836	0	0	1727	0
Flt Permitted					0.999			0.870				
Satd. Flow (perm)	0	0	0	0	4944	0	0	1612	0	0	1727	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5						31	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		55.1			112.4			118.4			114.0	
Travel Time (s)		4.0			8.1			10.7			10.3	
Confl. Peds. (#/hr)				25		45	22		37	37		22
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	8%	3%	5%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1376	0	0	67	0	0	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					2			4			4	
Permitted Phases				2			4					
Detector Phase				2	2		4	4			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0			10.0	
Minimum Split (s)				28.0	28.0		24.7	24.7			24.7	
Total Split (s)				59.0	59.0		31.0	31.0			31.0	
Total Split (%)				65.6%	65.6%		34.4%	34.4%			34.4%	
Maximum Green (s)				54.0	54.0		25.3	25.3			25.3	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				1.7	1.7		2.4	2.4			2.4	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.7			4.7	

Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		8.0	8.0				8.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					55.0			26.3				26.3
Actuated g/C Ratio					0.61			0.29				0.29
v/c Ratio					0.46			0.14				0.13
Control Delay					5.4			24.6				15.4
Queue Delay					0.1			0.0				0.0
Total Delay					5.4			24.6				15.4
LOS					A			C				B
Approach Delay					5.4			24.6				15.4
Approach LOS					A			C				B
Queue Length 50th (m)					17.4			9.0				4.8
Queue Length 95th (m)					20.0			19.2				14.8
Internal Link Dist (m)		31.1			88.4			94.4				90.0
Turn Bay Length (m)												
Base Capacity (vph)					3023			471				526
Starvation Cap Reductn					408			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.53			0.14				0.13

Intersection Summary















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 80 (89%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 6.7 Intersection LOS: A
 Intersection Capacity Utilization 47.4% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Hughson Street N & Cannon Street E



















Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	47	1207	0	0	0	0	0	27	27
Future Volume (vph)	0	0	0	47	1207	0	0	0	0	0	27	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4975	0	0	0	0	0	1730	0
Flt Permitted					0.998							
Satd. Flow (perm)	0	0	0	0	4963	0	0	0	0	0	1730	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					30							28
Link Speed (k/h)		50			50			40				40
Link Distance (m)		115.4			120.3			45.3				122.5
Travel Time (s)		8.3			8.7			4.1				11.0
Confl. Peds. (#/hr)				33		23	10		17	17		10
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1320	0	0	0	0	0	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA							NA
Protected Phases					2							4
Permitted Phases				2								
Detector Phase				2	2							4
Switch Phase												
Minimum Initial (s)				10.0	10.0							10.0
Minimum Split (s)				31.2	31.2							28.5
Total Split (s)				57.0	57.0							33.0
Total Split (%)				63.3%	63.3%							36.7%
Maximum Green (s)				51.8	51.8							27.5
Yellow Time (s)				3.3	3.3							3.0
All-Red Time (s)				1.9	1.9							2.5
Lost Time Adjust (s)					-1.0							-1.0
Total Lost Time (s)					4.2							4.5

Lanes, Volumes, Timings
 12: John Street N & Robert Street

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	12	17	5	8	5	8	247	19	6	178	5
Future Volume (vph)	3	12	17	5	8	5	8	247	19	6	178	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1686	0	0	1653	0	0	1713	0	0	1835	0
Flt Permitted		0.984			0.951			0.990			0.989	
Satd. Flow (perm)	0	1661	0	0	1578	0	0	1698	0	0	1815	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			5			10			4	
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		67.6			76.0			182.0			63.2	
Travel Time (s)		6.1			6.8			16.4			5.7	
Confl. Peds. (#/hr)	22		25	25		22	23		28	28		23
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	14%	0%	0%	9%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	19	0	0	295	0	0	202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	15.8	15.8		15.8	15.8		28.8	28.8		28.8	28.8	
Total Split (s)	21.2	21.2		21.2	21.2		28.8	28.8		28.8	28.8	
Total Split (%)	42.4%	42.4%		42.4%	42.4%		57.6%	57.6%		57.6%	57.6%	
Maximum Green (s)	15.4	15.4		15.4	15.4		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.8			4.8			4.8			4.8	

Lanes, Volumes, Timings
 12: John Street N & Robert Street

11-21-2024

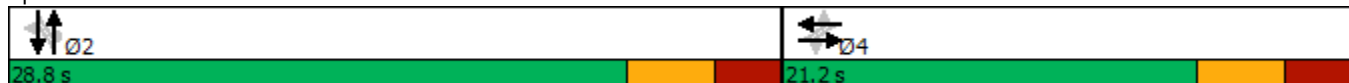


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)							12.0	12.0		12.0	12.0	
Flash Dont Walk (s)							10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		16.4			16.4			21.0			21.0	
Actuated g/C Ratio		0.35			0.35			0.45			0.45	
v/c Ratio		0.06			0.03			0.39			0.25	
Control Delay		7.4			9.2			10.3			9.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.4			9.2			10.3			9.0	
LOS		A			A			B			A	
Approach Delay		7.4			9.2			10.3			9.0	
Approach LOS		A			A			B			A	
Queue Length 50th (m)		0.9			0.8			15.3			9.9	
Queue Length 95th (m)		5.1			4.0			29.6			20.1	
Internal Link Dist (m)		43.6			52.0			158.0			39.2	
Turn Bay Length (m)												
Base Capacity (vph)		591			553			871			928	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.06			0.03			0.34			0.22	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 47
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 9.6
 Intersection Capacity Utilization 34.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

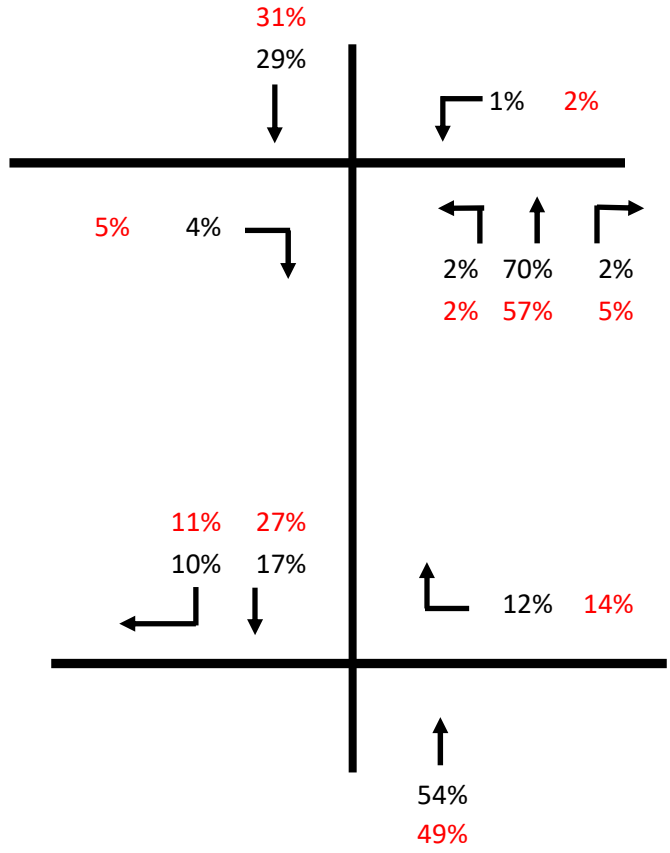
Splits and Phases: 12: John Street N & Robert Street



Appendix E

Existing Trip Assignment and 2016 Transportation Tomorrow Survey (TTS) Data Analysis

Existing Trip Assignment Based on Existing Traffic Turning Movement Counts



AM	PM
Total OB	Total OB
257	328

AM	PM
Total IB	Total IB
270	341

Residential Auto Trip Distribution - External Hamilton

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: Planning district of destination - pd_dest

Filters:

Primary travel mode of trip - mode_prime In D

M

P

T

U

and

Start time of trip - start_time In 600-900

and

2006 GTA zone of household - gta06_hhld In 5172

5184

5190

5193

and

Type of dwelling unit - dwell_type In 2

Trip 2016

Table:

	PD 8 of Toronto	Oakville	Burlington	Glanbrook	Hamilton	
5172	67	32	0	58	130	
5184	0	0	57	0	49	
5190	0	67	0	0	0	
	67	99	57	58	179	460
	15%	22%	12%	13%	39%	100%

Residential Auto Trip Distribution - Internal Hamilton

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

Primary travel mode of trip - mode_prime In D

M P T U

and

Start time of trip - start_time In 600-900

and

2006 GTA zone of household - gta06_hhld In 5172

5184 5190 5193

and

Ward number of destination - ward_dest In 171-185

Trip 2016

Table:

	5038	5088	5126	5155	5175	5198	
5172	58	39	56	0	74	100	
5184	0	0	0	49	0	0	
	58	39	56	49	74	100	376
	15%	10%	15%	13%	20%	27%	100%

39%

North

South

East

West

15% 6%

38% 15%

46% 18%



















39%

Appendix F

Future Total Level of Service Calculations

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	63	1278	37	123	227	0	0	87	30
Future Volume (vph)	0	0	0	63	1278	37	123	227	0	0	87	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4813	0	1767	1663	0	0	1640	0
Flt Permitted					0.998		0.677					
Satd. Flow (perm)	0	0	0	0	4808	0	1248	1663	0	0	1640	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7							21
Link Speed (k/h)		50			50			40				40
Link Distance (m)		112.4			115.4			83.7				61.3
Travel Time (s)		8.1			8.3			7.5				5.5
Confl. Peds. (#/hr)				13		15	9		10	10		9
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	6%	0%	1%	13%	0%	0%	12%	4%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1450	0	129	239	0	0	124	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.3	28.3		28.4	28.4				28.4
Total Split (s)				54.0	54.0		36.0	36.0				36.0
Total Split (%)				60.0%	60.0%		40.0%	40.0%				40.0%
Maximum Green (s)				48.7	48.7		30.6	30.6				30.6
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				2.0	2.0		2.1	2.1				2.1
Lost Time Adjust (s)					-1.0		-1.0	-1.0				-1.0
Total Lost Time (s)					4.3		4.4	4.4				4.4

Lanes, Volumes, Timings

3: John Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		12.0	12.0				12.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					49.7		31.6	31.6				31.6
Actuated g/C Ratio					0.55		0.35	0.35				0.35
v/c Ratio					0.55		0.29	0.41				0.21
Control Delay					11.9		23.5	24.8				18.1
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					12.0		23.5	24.8				18.1
LOS					B		C	C				B
Approach Delay					12.0			24.3				18.1
Approach LOS					B			C				B
Queue Length 50th (m)					58.2		16.8	32.5				12.8
Queue Length 95th (m)					71.3		31.5	53.5				25.8
Internal Link Dist (m)			88.4		91.4			59.7				37.3
Turn Bay Length (m)												
Base Capacity (vph)					2658		438	583				589
Starvation Cap Reductn					317		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.62		0.29	0.41				0.21

Intersection Summary


















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 44 (49%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 14.7 Intersection LOS: B
 Intersection Capacity Utilization 52.4% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 3: John Street N & Cannon Street E



Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	6	1418	15	3	24	0	0	8	17
Future Volume (vph)	0	0	0	6	1418	15	3	24	0	0	8	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4828	0	0	1802	0	0	1437	0
Flt Permitted								0.984				
Satd. Flow (perm)	0	0	0	0	4828	0	0	1783	0	0	1437	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3							17
Link Speed (k/h)		50			50			40				40
Link Distance (m)		55.1			112.4			118.4				114.0
Travel Time (s)		4.0			8.1			10.7				10.3
Confl. Peds. (#/hr)				10		8	3		9	9		3
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	7%	33%	0%	0%	0%	14%	19%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1468	0	0	27	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.0	28.0		24.7	24.7				24.7
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				54.0	54.0		25.3	25.3				25.3
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				1.7	1.7		2.4	2.4				2.4
Lost Time Adjust (s)					-1.0			-1.0				-1.0
Total Lost Time (s)					4.0			4.7				4.7

Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		8.0	8.0				8.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					55.0			26.3				26.3
Actuated g/C Ratio					0.61			0.29				0.29
v/c Ratio					0.50			0.05				0.06
Control Delay					3.3			23.3				13.7
Queue Delay					0.1			0.0				0.0
Total Delay					3.4			23.3				13.7
LOS					A			C				B
Approach Delay					3.4			23.3				13.7
Approach LOS					A			C				B
Queue Length 50th (m)					11.1			3.5				1.0
Queue Length 95th (m)					12.8			9.8				6.9
Internal Link Dist (m)			31.1		88.4			94.4				90.0
Turn Bay Length (m)												
Base Capacity (vph)					2951			521				431
Starvation Cap Reductn					267			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.55			0.05				0.06

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 49 (54%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 3.9 Intersection LOS: A
 Intersection Capacity Utilization 50.1% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Hughson Street N & Cannon Street E



Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑	
Traffic Volume (vph)	0	0	0	40	1381	0	0	0	0	0	18	18
Future Volume (vph)	0	0	0	40	1381	0	0	0	0	0	18	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4842	0	0	0	0	0	1686	0
Flt Permitted					0.999							
Satd. Flow (perm)	0	0	0	0	4838	0	0	0	0	0	1686	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					30						19	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		115.4			120.3			45.3			122.5	
Travel Time (s)		8.3			8.7			4.1			11.0	
Confl. Peds. (#/hr)				15		18	4		12	12		4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	6%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1481	0	0	0	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA							NA
Protected Phases					2							4
Permitted Phases				2								
Detector Phase				2	2							4
Switch Phase												
Minimum Initial (s)				10.0	10.0						10.0	
Minimum Split (s)				31.2	31.2						28.5	
Total Split (s)				58.0	58.0						32.0	
Total Split (%)				64.4%	64.4%						35.6%	
Maximum Green (s)				52.8	52.8						26.5	
Yellow Time (s)				3.3	3.3						3.0	
All-Red Time (s)				1.9	1.9						2.5	
Lost Time Adjust (s)					-1.0						-1.0	
Total Lost Time (s)					4.2						4.5	

Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Minimum Gap (s)				3.0	3.0							3.0
Time Before Reduce (s)				0.0	0.0							0.0
Time To Reduce (s)				0.0	0.0							0.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				15.0	15.0							12.0
Flash Dont Walk (s)				7.0	7.0							9.0
Pedestrian Calls (#/hr)				0	0							0
Act Effct Green (s)					78.2							11.0
Actuated g/C Ratio					0.87							0.12
v/c Ratio					0.35							0.17
Control Delay					2.3							24.2
Queue Delay					0.0							0.0
Total Delay					2.3							24.2
LOS					A							C
Approach Delay					2.3							24.2
Approach LOS					A							C
Queue Length 50th (m)					23.2							3.1
Queue Length 95th (m)					28.3							12.4
Internal Link Dist (m)		91.4			96.3			21.3				98.5
Turn Bay Length (m)												
Base Capacity (vph)					4206							528
Starvation Cap Reductn					0							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.35							0.07

Intersection Summary

















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 39 (43%), Referenced to phase 2:WBTL and 6:, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 2.9 Intersection LOS: A
 Intersection Capacity Utilization 44.2% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 9: Catharine Street N & Cannon Street E



Lanes, Volumes, Timings
 12: John Street N & Robert Street

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	4	14	3	1	3	7	276	5	2	123	5
Future Volume (vph)	5	4	14	3	1	3	7	276	5	2	123	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1561	0	0	1485	0	0	1679	0	0	1779	0
Flt Permitted		0.961			0.926			0.993			0.996	
Satd. Flow (perm)	0	1513	0	0	1378	0	0	1668	0	0	1774	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			4			2			5	
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		67.6			76.0			120.7			63.2	
Travel Time (s)		6.1			6.8			10.9			5.7	
Confl. Peds. (#/hr)	8		31	31		8	29		18	18		29
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	8%	33%	0%	0%	0%	12%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	9	0	0	356	0	0	160	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	15.8	15.8		15.8	15.8		28.8	28.8		28.8	28.8	
Total Split (s)	21.2	21.2		21.2	21.2		28.8	28.8		28.8	28.8	
Total Split (%)	42.4%	42.4%		42.4%	42.4%		57.6%	57.6%		57.6%	57.6%	
Maximum Green (s)	15.4	15.4		15.4	15.4		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.8			4.8			4.8			4.8	

Lanes, Volumes, Timings
 12: John Street N & Robert Street

11-21-2024

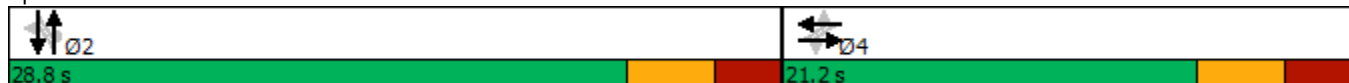


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)							12.0	12.0		12.0	12.0	
Flash Dont Walk (s)							10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		16.4			16.4			21.3			21.3	
Actuated g/C Ratio		0.35			0.35			0.45			0.45	
v/c Ratio		0.05			0.02			0.47			0.20	
Control Delay		7.4			8.9			11.6			8.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.4			8.9			11.6			8.4	
LOS		A			A			B			A	
Approach Delay		7.4			8.9			11.6			8.4	
Approach LOS		A			A			B			A	
Queue Length 50th (m)		0.6			0.3			20.0			7.5	
Queue Length 95th (m)		4.0			2.3			32.1			14.1	
Internal Link Dist (m)		43.6			52.0			96.7			39.2	
Turn Bay Length (m)												
Base Capacity (vph)		536			480			847			903	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.05			0.02			0.42			0.18	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 47.3
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 10.4 Intersection LOS: B
 Intersection Capacity Utilization 35.1% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 12: John Street N & Robert Street



HCM Unsignalized Intersection Capacity Analysis
 15: John Street N & Site Access

11-21-2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	8	10	254	109	6
Future Volume (Veh/h)	23	8	10	254	109	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	9	11	276	118	7
Pedestrians	50			50	50	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	4			4	4	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)				61	121	
pX, platoon unblocked	0.90					
vC, conflicting volume	520	222	175			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	408	222	175			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	99			
cM capacity (veh/h)	495	758	1356			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	34	287	125			
Volume Left	25	11	0			
Volume Right	9	0	7			
cSH	545	1356	1700			
Volume to Capacity	0.06	0.01	0.07			
Queue Length 95th (m)	1.6	0.2	0.0			
Control Delay (s)	12.0	0.4	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.0	0.4	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			38.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←↑↑↑		↑	↑			↑	
Traffic Volume (vph)	0	0	0	85	1094	56	159	241	0	0	165	31
Future Volume (vph)	0	0	0	85	1094	56	159	241	0	0	165	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4928	0	1767	1708	0	0	1798	0
Flt Permitted					0.997		0.545					
Satd. Flow (perm)	0	0	0	0	4906	0	995	1708	0	0	1798	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					14						11	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		112.4			115.4			83.7			60.4	
Travel Time (s)		8.1			8.3			7.5			5.4	
Confl. Peds. (#/hr)				33		33	22		30	30		22
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	1%	10%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1274	0	164	248	0	0	202	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					2			4			4	
Permitted Phases				2			4					
Detector Phase				2	2		4	4			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0			10.0	
Minimum Split (s)				28.3	28.3		28.4	28.4			28.4	
Total Split (s)				59.0	59.0		31.0	31.0			31.0	
Total Split (%)				65.6%	65.6%		34.4%	34.4%			34.4%	
Maximum Green (s)				53.7	53.7		25.6	25.6			25.6	
Yellow Time (s)				3.3	3.3		3.3	3.3			3.3	
All-Red Time (s)				2.0	2.0		2.1	2.1			2.1	
Lost Time Adjust (s)					-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)					4.3		4.4	4.4			4.4	

Lanes, Volumes, Timings
 3: John Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		12.0	12.0				12.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					54.7		26.6	26.6				26.6
Actuated g/C Ratio					0.61		0.30	0.30				0.30
v/c Ratio					0.43		0.56	0.49				0.37
Control Delay					7.6		35.4	30.2				26.1
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					7.7		35.4	30.2				26.1
LOS					A		D	C				C
Approach Delay					7.7			32.2				26.1
Approach LOS					A			C				C
Queue Length 50th (m)					41.3		25.1	37.0				27.3
Queue Length 95th (m)					51.3		46.6	60.5				46.9
Internal Link Dist (m)			88.4		91.4			59.7				36.4
Turn Bay Length (m)												
Base Capacity (vph)					2987		294	504				539
Starvation Cap Reductn					580		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.53		0.56	0.49				0.37

Intersection Summary


















Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 74 (82%), Referenced to phase 2:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 15.0
 Intersection Capacity Utilization 62.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: John Street N & Cannon Street E



Lanes, Volumes, Timings
6: Hughson Street N & Cannon Street E

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  							
Traffic Volume (vph)	0	0	0	14	1260	22	29	34	0	0	35	29
Future Volume (vph)	0	0	0	14	1260	22	29	34	0	0	35	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4947	0	0	1836	0	0	1727	0
Flt Permitted					0.999			0.870				
Satd. Flow (perm)	0	0	0	0	4944	0	0	1612	0	0	1727	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5							31
Link Speed (k/h)		50			50			40				40
Link Distance (m)		55.1			112.4			118.4				114.0
Travel Time (s)		4.0			8.1			10.7				10.3
Confl. Peds. (#/hr)				25		45	22		37	37		22
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	8%	3%	5%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	5	0	0	5	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1378	0	0	67	0	0	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					2			4				4
Permitted Phases				2			4					
Detector Phase				2	2		4	4				4
Switch Phase												
Minimum Initial (s)				10.0	10.0		10.0	10.0				10.0
Minimum Split (s)				28.0	28.0		24.7	24.7				24.7
Total Split (s)				59.0	59.0		31.0	31.0				31.0
Total Split (%)				65.6%	65.6%		34.4%	34.4%				34.4%
Maximum Green (s)				54.0	54.0		25.3	25.3				25.3
Yellow Time (s)				3.3	3.3		3.3	3.3				3.3
All-Red Time (s)				1.7	1.7		2.4	2.4				2.4
Lost Time Adjust (s)					-1.0			-1.0				-1.0
Total Lost Time (s)					4.0			4.7				4.7

Lanes, Volumes, Timings

6: Hughson Street N & Cannon Street E

11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Minimum Gap (s)				3.0	3.0		3.0	3.0				3.0
Time Before Reduce (s)				0.0	0.0		0.0	0.0				0.0
Time To Reduce (s)				0.0	0.0		0.0	0.0				0.0
Recall Mode				C-Max	C-Max		Max	Max				Max
Walk Time (s)				12.0	12.0		8.0	8.0				8.0
Flash Dont Walk (s)				11.0	11.0		10.0	10.0				10.0
Pedestrian Calls (#/hr)				0	0		0	0				0
Act Effct Green (s)					55.0			26.3				26.3
Actuated g/C Ratio					0.61			0.29				0.29
v/c Ratio					0.46			0.14				0.13
Control Delay					5.4			24.6				15.4
Queue Delay					0.1			0.0				0.0
Total Delay					5.4			24.6				15.4
LOS					A			C				B
Approach Delay					5.4			24.6				15.4
Approach LOS					A			C				B
Queue Length 50th (m)					17.6			9.0				4.8
Queue Length 95th (m)					20.2			19.2				14.8
Internal Link Dist (m)			31.1		88.4			94.4				90.0
Turn Bay Length (m)												
Base Capacity (vph)					3023			471				526
Starvation Cap Reductn					408			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.53			0.14				0.13

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	80 (89%), Referenced to phase 2:WBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.46
Intersection Signal Delay:	6.7
Intersection LOS:	A
Intersection Capacity Utilization:	47.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 6: Hughson Street N & Cannon Street E



Lanes, Volumes, Timings
 9: Catharine Street N & Cannon Street E

















11-21-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑						↑	
Traffic Volume (vph)	0	0	0	47	1212	0	0	0	0	0	27	27
Future Volume (vph)	0	0	0	47	1212	0	0	0	0	0	27	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	0	0	0	4975	0	0	0	0	0	1730	0
Flt Permitted					0.998							
Satd. Flow (perm)	0	0	0	0	4963	0	0	0	0	0	1730	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					30							28
Link Speed (k/h)		50			50			40				40
Link Distance (m)		115.4			120.3			45.3				122.5
Travel Time (s)		8.3			8.7			4.1				11.0
Confl. Peds. (#/hr)				33		23	10		17	17		10
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1325	0	0	0	0	0	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type				Perm	NA							NA
Protected Phases					2							4
Permitted Phases				2								
Detector Phase				2	2							4
Switch Phase												
Minimum Initial (s)				10.0	10.0							10.0
Minimum Split (s)				31.2	31.2							28.5
Total Split (s)				57.0	57.0							33.0
Total Split (%)				63.3%	63.3%							36.7%
Maximum Green (s)				51.8	51.8							27.5
Yellow Time (s)				3.3	3.3							3.0
All-Red Time (s)				1.9	1.9							2.5
Lost Time Adjust (s)					-1.0							-1.0
Total Lost Time (s)					4.2							4.5

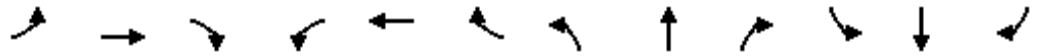
Lanes, Volumes, Timings
12: John Street N & Robert Street

11-21-2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	12	19	6	8	5	9	261	20	6	186	5
Future Volume (vph)	3	12	19	6	8	5	9	261	20	6	186	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1676	0	0	1660	0	0	1713	0	0	1835	0
Flt Permitted		0.985			0.943			0.989			0.989	
Satd. Flow (perm)	0	1653	0	0	1572	0	0	1697	0	0	1815	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			5			10			3	
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		67.6			76.0			121.6			63.2	
Travel Time (s)		6.1			6.8			10.9			5.7	
Confl. Peds. (#/hr)	22		25	25		22	23		28	28		23
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	14%	0%	0%	9%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	5	0	0	5
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	20	0	0	313	0	0	211	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	
Minimum Split (s)	15.8	15.8		15.8	15.8		28.8	28.8		28.8	28.8	
Total Split (s)	21.2	21.2		21.2	21.2		28.8	28.8		28.8	28.8	
Total Split (%)	42.4%	42.4%		42.4%	42.4%		57.6%	57.6%		57.6%	57.6%	
Maximum Green (s)	15.4	15.4		15.4	15.4		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		4.8			4.8			4.8			4.8	

Lanes, Volumes, Timings
 12: John Street N & Robert Street

11-21-2024

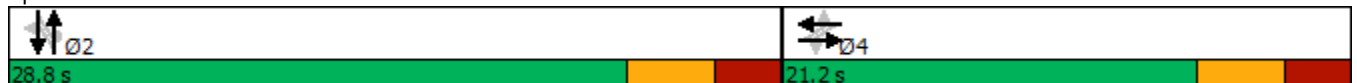


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)							12.0	12.0		12.0	12.0	
Flash Dont Walk (s)							10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		16.4			16.4			21.0			21.0	
Actuated g/C Ratio		0.35			0.35			0.45			0.45	
v/c Ratio		0.06			0.04			0.41			0.26	
Control Delay		7.2			9.2			10.6			9.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.2			9.2			10.6			9.1	
LOS		A			A			B			A	
Approach Delay		7.2			9.2			10.6			9.1	
Approach LOS		A			A			B			A	
Queue Length 50th (m)		0.9			0.8			16.4			10.4	
Queue Length 95th (m)		5.2			4.1			31.7			21.0	
Internal Link Dist (m)		43.6			52.0			97.6			39.2	
Turn Bay Length (m)												
Base Capacity (vph)		589			551			871			928	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.06			0.04			0.36			0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 47
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 9.8
 Intersection Capacity Utilization 35.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 12: John Street N & Robert Street



HCM Unsignalized Intersection Capacity Analysis

15: John Street N & Site Access

11-21-2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	9	20	277	187	11
Future Volume (Veh/h)	16	9	20	277	187	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	10	22	301	203	12
Pedestrians	50			50	50	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	4			4	4	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)				60	122	
pX, platoon unblocked	0.89	1.00	1.00			
vC, conflicting volume	654	309	265			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	541	307	263			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	99	98			
cM capacity (veh/h)	405	678	1258			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	323	215			
Volume Left	17	22	0			
Volume Right	10	0	12			
cSH	476	1258	1700			
Volume to Capacity	0.06	0.02	0.13			
Queue Length 95th (m)	1.4	0.4	0.0			
Control Delay (s)	13.0	0.7	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.0	0.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	1.0					
Intersection Capacity Utilization	49.1%			ICU Level of Service	A	
Analysis Period (min)	15					

Appendix G

Study Terms of Reference



April 29, 2024

Attention: Daniel Barnett, Planner II, Development Planning
Prepared By: Bart Brosseau, Transportation Planning Technologist, Transportation Planning

SUBJECT: 175 John Street North, Hamilton (Ward 2)
UHOPA-23-012 & ZAC-23-027 (Previous Files: FC-22-034)

- Transportation Assessment –**REVISIONS REQUIRED**
- Neighbourhood Traffic Calming Options Report – **CLARIFICATION REQUIRED**
- Parking Analysis/Study - **REVISIONS REQUIRED**
- Transportation Demand Management Options Report – **MEASURES REQUIRED**
- Right-of-Way Dedications – **REQUIRED**
- Site Plan – **FUTURE REQUIREMENTS**
- Special Conditions of Future Site Plan Approval - **REQUIRED**

Documents Reviewed

- *Site Plan Preliminary, 175 John Street North, dated February 20, 2024*
- *Floor Plan – Level 1, 175 John Street North, dated February 20, 2024*
- *Floor Plan – Level P1, 175 John Street North, dated February 20, 2024*
- *Floor Plan – Level P2, 175 John Street North, dated February 20, 2024*
- *Transportation Impact Study Update Proposed Residential Development, 175 John Street North, dated January 2024*

Transportation Assessment – Revisions Required

Transportation Planning requires the following revisions to the TIS and Site Plan to be consistent between the two documents:

1. The TIS states that the development will provide one bicycle repair station on-site. The site plan and floor plan that Transportation Planning reviewed need to identify the location of the bicycle repair station. The TIS stated in “Figure 12-Potential Bicycle Repair Station Location” see below **Figure 1**.

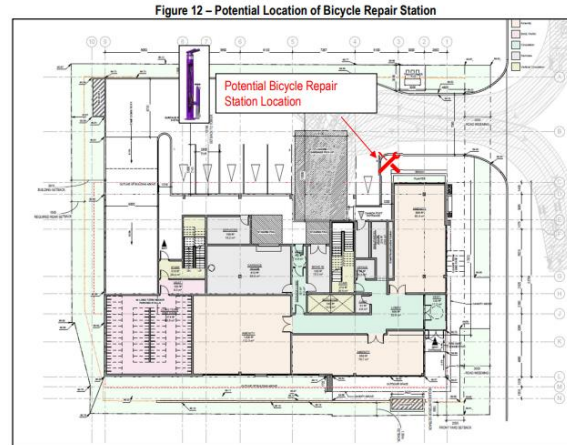


Figure 1 Potential Bicycle Repair Station Location

2. There is a discrepancy between existing traffic and background traffic. Existing southbound John Street North and Robert Street have 106 PM and 77 AM trips, and the background growth has 106 PM and 77 AM trips. There should be a difference between at a rate of 1% for 8 years should be an increase of 8 vehicles.
3. 7.3. Traffic Calming states that traffic calming is “not required on John Street North in the proximity of the proposed development at this time”. “At this time” indicates that traffic calming will be required, so at what time would traffic calming be required?
4. 8.1 Zoning By-law Vehicle Parking Requirements- Use the most up-to-date Zoning By-law. The 2009 Zoning by-law is out of date as of the time of the TIS update. The Traffic Consultant should be using the 2021 Zoning By-law 05-200. Further updates should be using current By-laws and policies.
5. The proposed reduction in parking by 65% (77) parking spaces is aggressive. Please provide justification and reasoning for the proposed reduction in parking provided.
6. 8.3.3 Existing Modal Share; Transportation Planning notes that this development is technically not part of the Downtown area; it is outside the downtown area.
7. The TIS states reduction in parking spaces makes the housing units more affordable. How many of the 126 units will be affordable housing?
8. The description of the Sidewalks and Pathways is describing a different area of the City of Hamilton. See **Figure 2**.



10.1.3. Sidewalks and Pathways

The proposed development will maintain continuous sidewalks along James Street S, Hughson Street S and Jackson Street E, as illustrated in **Figure 2**. The proposed development also provides direct building access onto James Street S, Hughson Street S and Jackson Street E, where appropriate.

Figure 2 Not the location of this development

- 9. The Owner will unbundle the parking from the sale of the units. Transportation Planning will require a signed letter of intent from the Owner indicating the intention to unbundle the cost of a parking stall from the cost of an individual residential unit.
- 10. The AutoTURN Analysis MSU TAC-2017 has the vehicle colliding with the building. See **Figure 3**

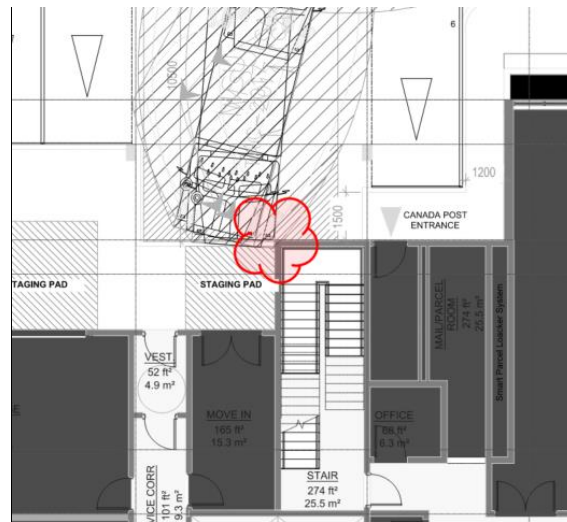


Figure 3 Vehicle contacting building.

- 11. Cannon Street and John Street the Traffic consultant has identified that there was a vehicle driving in the wrong direction on cannon and not identified as bicycles on the cycle track. (page 113 on the electronic pdf)
- 12. Appendix C Background Developments; The highlighted numbers below are incorrect number of trips.



41 Wilson Street								
ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	908	Average Trip Rates (No equation given)	0.08	0.15	0.23	0.15	0.11	0.26
		Total Trips	69	140	209	135	101	236
80 John Street N								
ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	700	Average Trip Rates (No equation given)	0.08	0.15	0.23	0.15	0.11	0.26
		Total Trips	53	108	161	104	78	182
71 Rebecca Street								
ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise) LUC 222 Close to Rail Transit	477	Average Trip Rates (No equation given)	0.08	0.15	0.23	0.15	0.11	0.26
		Total Trips	36	74	110	71	53	124
Total			158	322	480	310	232	542

Neighbourhood Traffic Calming Options Report – Clarification Required

13. The Traffic Consultant stated in 7.3. Traffic Calming is “not required on John Street North in the proximity of the proposed development at this time”. “At this time” indicates that traffic calming will be required, so at what time would traffic calming be required?

Parking Analysis/Study – Revisions Required

14. The Site Plan submitted does not demonstrate proper functionality or is deficient in several areas regarding the layout of proposed parking and interactions with other components of the site accordingly. Transportation Planning requires the following revisions to the Site Plan before reconsidering approval:
 - a. Waste collection vehicles shall enter and exit the site in a forward manner. A revised plan must illustrate Waste collection vehicles entering and exiting in a forward motion and shall not conflict with proposed parking stalls accordingly.
 - b. The Site Plan must be revised to include dimensions for the driving aisles in the underground parking.
 - c. The Site Plan must be revised to illustrate a turning plan in the underground parking. Turning radii for the parking entrance and for ramps between levels may not be adequate. A turning plan must demonstrate adequate space for two-way flow or otherwise mitigate conflicts with structures/vehicles.



Transportation Demand Management Options Report– Measures Required

15. Without setting precedent, Transportation Planning does not require a report to be submitted for this application. However, the following TDM and TOD measures are required:
 - a. Provide short-term bicycle parking within the property limits as per the City of Hamilton Zoning By-Law 05-200 for the proposed land use type;
 - b. Provide long-term bicycle parking that is secure and shielded from the elements as per the City of Hamilton Zoning By-Law 05-200 for the proposed land use type;
 - c. Parking should be unbundled from the cost of purchasing/renting a residential unit;
 - d. Sidewalks and pedestrian pathways should be a minimum of between 2.5 metres, and up to 4.5 metres if possible;
 - e. Pedestrian walkways, bicycle paths, pedestrian amenities, and clear directional and wayfinding signage will promote connectivity to transit; and
 - f. Ridesharing, carpooling, promoting active forms of transportation, as well as providing transit passes is encouraged to promote larger density sites.

Right-of-Way Dedications – Required

16. The Council Approved Urban Official Plan: Schedule C-2 - Future Right-of-Way Dedications. John Street is to be 26.213 metres from Hunter Street to Barton Street as per survey plan P-821(A). The existing right-of-way at the subject property is approximately 20 metres. Approximately ± 3.048 metres are to be dedicated to the right-of-way on John Street North.
 - a. A survey conducted by an Ontario Land Surveyor and at the Applicant's expense will determine the ultimate dimensions for the right-of-way widening.
 - b. The Applicant's surveyor is to contact Geomatics and Corridor Management to confirm the right-of-way dedication requirements.
 - c. Subject to the satisfaction and approval of the Manager, Transportation Planning.

Site Plan – Future Requirements

17. 5.0 metres x 5.0 metres visibility triangles must be provided for the driveway access. They must be illustrated, dimensioned and identified on the site plan. Visibility triangles are between the driveway limits and the ultimate property line (right-of-way limit). No object or mature vegetation can exceed a height of 0.6 metres above the corresponding perpendicular centreline elevation of the adjacent street.
18. The Applicant/Owner must provide a turning plan that illustrates how vehicles will access the ramp down to the Underground Parking
19. The first 7.5 metres of the driveway from the property line shall be a maximum 5%



grade and thereafter shall be within a maximum 10% grade.

- 20. Transportation Planning notes that a maximum grade percentage of 10% is required as per City of Hamilton Comprehensive Development Guidelines for parking garage ramps. The site plan indicates grades in excess of the 10% maximum. When the ramp grades do not conform to City Development Guidelines; as a Special Condition of Site Plan Approval, prior to application for any building permits, a letter certifying the design of the ramp will be required to be provided and signed by a Licenced Architect or Engineer, to the satisfaction of the Manager, Transportation Planning.
- 21. The turning plan for the MSU TAC-2017 is demonstrating the vehicle driving over the curb.

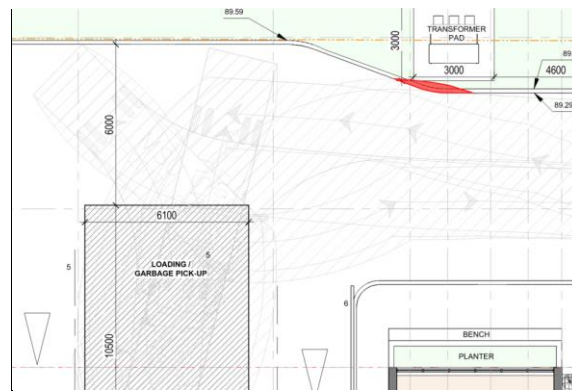


Figure 4 Vehicle Driving Over Curb

- 22. Passenger car contacting structure.

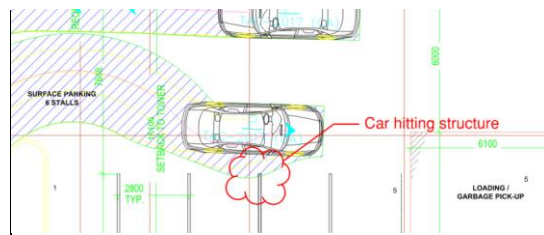


Figure 5 Vehicle Contacting Structure

Special Conditions of Future Site Plan Approval – Required

- 23. As a Special Condition of Site Plan Approval, prior to application for any building permits, a letter certifying the design of the ramp will be required to be provided and signed by a Licenced Architect or Engineer, to the satisfaction of the Manager, Transportation Planning.
- 24. As a Special Condition of Site Plan Approval, prior to application for any building permits, a letter of intent is required to be provided to be signed by the Owner indicating the intention to unbundle the cost of a parking stall from the cost of an



Hamilton

individual residential unit.

Should you have any questions, please email tplanning@hamilton.ca, referencing:
175 John Street North – UHOPA-23-012 & ZAC-23-027 (Ward 2) Transportation Planning
Response

cc: Development Engineering Approvals

From: Transportation Planning <Transportation.Planning@hamilton.ca>
Sent: September 13, 2022 8:58 AM
To: Sam Nguyen <sam@nextrans.ca>
Subject: FW: Terms of Reference for 175 John Street, Hamilton

Hi Sam,
See additional information / requirements in **red** below
Thanks

Bart Brosseau
Transportation Planning Technologist
Transportation Planning



The City of Hamilton encourages physical distancing, wearing a mask in an enclosed public space, and increased handwashing. Learn more about the City's response to COVID-19 www.hamilton.ca/coronavirus.

From: Sam Nguyen <>
Sent: Wednesday, August 31, 2022 1:59 PM
To: Transportation Planning <Transportation.Planning@hamilton.ca>
Subject: Terms of Reference for 175 John Street, Hamilton

Good afternoon,

We have been retained to undertake a TIS to support the proposed residential development located at 175 John Street, in the City of Hamilton. The following is a proposed scope of the TIS that takes into consideration the City's Traffic Impact Study Guidelines:

1. Study Area intersection:
 - a. John Street North/ Cannon Street East
 - b. John Street North/Robert Street
 - c. Cannon Street East/Catharine Street North
 - d. **[Cannon Street East / Hughson Street North]**
 - e. Site Access~~(es)~~
2. Horizon Year
 - a. Project completion by 2024-2025
 - b. Analysis horizon year 2030 (*as per the City's TIS guidelines*)

3. Background Developments and Growth Rate
 - a. Background corridor through traffic growth – 1.5% as per City typical requirements
Without setting precedent, Transportation Planning will accept an annual growth rate of 1.0%
 - b. Please let us know if any proposed background developments in the area **Without setting precedent, for the purposes of this report the background annual growth rate will be utilized to account for background developments within the surrounding area**
 - c. Please send us any available TIS for the background developments in the area
4. Trip Generation
 - a. ITE Trip Generation Manual 11th Edition
5. Trip Distribution
 - a. Extract 2016 TTS data based on the surrounding traffic zones or use existing trip distribution, where appropriate
6. Future Total Assessment
 - a. The following tasks will be conducted for the future total conditions:
 - Future Total Traffic Assessment for Auto Mode (using existing signal timing and optimize as necessary) *(use existing signal timings. If optimized timings are provided, they are to be provided **in addition** to the existing signal timings)*
 - Future non-auto mode assessment
 - Proposed development access assessment
 - Vehicular and Bicycle Parking Assessment
 - Internal Site Circulation and loading assessment
7. Transit, Active Transportation and TDM
 - a. Conduct a review of the existing and proposed future transit network in the area. Based on these findings, appropriate recommendations will be provided to ensure adequate walking distances to/from the proposed development to transit stations/stops.
 - b. Review the existing and proposed future active transportation network in the area. Based on these findings, Nextrans will identify missing gaps and additional interconnections and connections from the proposed development to adjacent land uses, the City facilities, as well as to transit stations/stops. **Will the Applicant be improving these identified connections?!**
 - c. ~~A Transportation Demand Management (TDM) assessment will be undertaken to identify specific measures and programs to reduce single-occupant vehicle trips to/from the proposed development. These TDM measures and programs may include but not limited to, Carpooling, Auto Share, Bike racks, Parking management strategies, etc. The TDM report will be completed and included as part of this Study for submission purposes submitted in accordance with the City requirements. **TDM assessment is not required for the purposes of this report. Please follow Transportation Planning's requirements to provide short-term and long-term bicycle parking according to Zoning By-Law 05-200 and state if the Owner will be providing additional TDM measures such as providing Transit Passes to the new residents**~~

of the development or provision of a carshare parking space along with a carshare vehicle]

(The Applicant does not have to do a TDM report, but Transportation Planning requires:

- 1. Short-term bicycle parking within the property limits as per the City of Hamilton Zoning By-Law 05-200 for the proposed land use type;*
 - 2. Long-term bicycle parking that is secure and shielded from the elements as per the City of Hamilton Zoning By-Law 05-200 for the proposed land use type;*
- d. Transportation Planning recommends that the Applicant provides*
- 1. Transit Passes (Presto Pass, HSR pass),*
 - 2. Carshare space and vehicle.)*

Sam (Trang) Nguyen
Transportation Analyst

o: 905-503-2563 ext. 207
e: sam@nextrans.ca
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