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**RE: Regent Park Revitalization Phases 4 & 5 – Proposed Mixed-Use Development  
Zoning By-law Amendment Application  
Response to City Comments & Transportation Study Addendum**

## **1.0 INTRODUCTION**

BA Group is retained by Toronto Community Housing Corporation (TCHC) and their development partner Deltera Inc. (Tridel) to provide urban transportation consulting services in relation to a proposed mixed-use development pertaining to the lands generally bounded by Dreamers Way in the west, Gerrard Street East in the north, River Street in the east, and Oak Street to the south (excluding 40 Oak Street; the Fred Victor building) located in the City of Toronto (herein referred to as the “Site”). The municipal addresses are 325-433 Gerrard Street East, 295 & 325 Sackville Street, 259-267 & 266-272 Sumach Street, and 184-206 River Street.

The Site is part of a larger multi-phased development project known as the *Regent Park Revitalization*; the proposed redevelopment pertains to Phases 4 and 5, which are the final two phases. The *Regent Park Secondary Plan* established a framework to guide the phased redevelopment of the area to achieve a revitalized mixed income and mixed use neighbourhood.

## **1.1 STUDY BACKGROUND**

In April of 2022, BA Group submitted a transportation study as part of the Zoning By-law Amendment (ZBA) application (herein referred to as the “April 2022 TIS”). The study proposed a mixed-use development inclusive of residential uses of varied tenure, ground-floor retail units, community uses and a relocated Parliament Street library branch.

Comments on the April 2022 TIS were then received from the City of Toronto. An updated addendum was submitted in November of 2022 that included BA’s responses to these comments.

Since the November 2022 addendum, further comments have been received from the City in February of 2023. This study responds to these latest comments and incorporates changes to the development plan and the supporting area road network.

## 1.2 DEVELOPMENT PLAN UPDATE

Since the November 2022 addendum, the development program has been revised. A comparison of key characteristics for each block within the previous and current development is provided in **Table 1**. Reduced architectural Site plans are included in **Appendix A** for reference. A new public street, Street 'G', has been introduced into the plan, which has modified the block naming conventions. The prior submission contained four (4) development blocks, where as the current submission contains five (5) development blocks.

The mixed-use development is inclusive of residential uses of varied tenure, ground-floor retail units, community uses, and a relocated library. In total, the current development program includes approximately 3,246 residential dwelling units (1,976 market units and 1,270 affordable units) and 16,452 m<sup>2</sup> non-residential GFA. This represents an increase of 176 residential units and 962 m<sup>2</sup> non-residential GFA in comparison to the April 2022 program.

Proposed retail/commercial non-residential space is not proposed at this time to be separated into "office" and "retail" uses. This separation – based on a 25% office and 75% retail allocation assumption – is included in this report for analytical purposes only and is subject to change at the detailed design phase.

The current development plan also includes the introduction of two additional north-south linkages which extend between Oak Street and Gerrard Street East: a private street between Dreamers Way and Sackville Street and the extension of Tubman Avenue.

## 1.3 THIS LETTER

This addendum letter provides responses to the received City comments, discusses and analyzes the changes to the development plans, and provides updates to the transportation study where applicable for the purposes of the ZBA submission.



**TABLE 1 DEVELOPMENT PROGRAM**

Block	Market Residential	Affordable Residential	Office <sup>1</sup>	Retail <sup>1</sup>	Community/Culture Uses	Library
<b>Previous November 2022 Submission</b>						
Building 1A	--	202 units	237 m <sup>2</sup> GFA	711 m <sup>2</sup> GFA	1,358 m <sup>2</sup> GFA	--
Buildings 1B & 1C	713 units	--	330 m <sup>2</sup> GFA	989 m <sup>2</sup> GFA	--	--
Buildings 2D & 2E	505 units	--	511 m <sup>2</sup> GFA	1,532 m <sup>2</sup> GFA	--	--
Buildings 2F & 2G	--	--	380 m <sup>2</sup> GFA	1,139 m <sup>2</sup> GFA	1,164 m <sup>2</sup> GFA	2,277 m <sup>2</sup> GFA
Buildings 2H & 2I	--	333 units	376 m <sup>2</sup> GFA	1,127 m <sup>2</sup> GFA	572 m <sup>2</sup> GFA	--
Buildings 3J & 3K	657 units	--	270 m <sup>2</sup> GFA	809 m <sup>2</sup> GFA	--	--
Buildings 4L & 4M	--	659 units	199 m <sup>2</sup> GFA	596 m <sup>2</sup> GFA	916 m <sup>2</sup> GFA	--
<b>Phases 4 &amp; 5 Previous Total</b>	<b>1,876 units</b>	<b>1,194 units</b>	<b>2,301 m<sup>2</sup> GFA</b>	<b>6,902 m<sup>2</sup> GFA</b>	<b>4,010 m<sup>2</sup> GFA</b>	<b>2,277 m<sup>2</sup> GFA</b>
	<b>Residential Unit Count Total: 3,070 units</b>		<b>Non-Residential GFA Total: 15,490 m<sup>2</sup> GFA</b>			
<b>Current Submission</b>						
Building 1A	--	274 units	269 m <sup>2</sup> GFA	809 m <sup>2</sup> GFA	1,395 m <sup>2</sup> GFA	--
Buildings 2B & 2C	731 units	--	333 m <sup>2</sup> GFA	1,001 m <sup>2</sup> GFA	--	--
Buildings 3D & 3E	520 units	--	554 m <sup>2</sup> GFA	1,663 m <sup>2</sup> GFA	--	--
Buildings 3F & 3G	--	--	379 m <sup>2</sup> GFA	1,139 m <sup>2</sup> GFA	1,164 m <sup>2</sup> GFA	2,277 m <sup>2</sup> GFA
Buildings 3H & 3I	--	343 units	415 m <sup>2</sup> GFA	1,247 m <sup>2</sup> GFA	605 m <sup>2</sup> GFA	--
Buildings 4J & 4K	725 units	--	323 m <sup>2</sup> GFA	971 m <sup>2</sup> GFA	--	--
Buildings 5L & 5M	--	653 units	238 m <sup>2</sup> GFA	715 m <sup>2</sup> GFA	955 m <sup>2</sup> GFA	--
<b>Phases 4 &amp; 5 Current Total</b>	<b>1,976 units</b>	<b>1,270 units</b>	<b>2,511 m<sup>2</sup> GFA</b>	<b>7,545 m<sup>2</sup> GFA</b>	<b>4,119 m<sup>2</sup> GFA</b>	<b>2,277 m<sup>2</sup> GFA</b>
	<b>Residential Unit Count Total: 3,246 units</b>		<b>Non-Residential GFA Total: 16,452 m<sup>2</sup> GFA</b>			
<b>Differences</b>						
<b>Phases 4 &amp; 5 Total Difference</b>	<b>+100 units</b>	<b>+76 units</b>	<b>+210 m<sup>2</sup> GFA</b>	<b>+643 m<sup>2</sup> GFA</b>	<b>+109 m<sup>2</sup> GFA</b>	<b>--</b>
	<b>Residential Unit Count Total: +176 units</b>		<b>Non-Residential GFA Total: +962 m<sup>2</sup> GFA</b>			

Notes:

- Proposed retail/commercial non-residential space is not proposed at this time to be separated into "office" and "retail" uses. This separation – based on a 25% office and 75% retail allocation assumption – is included in this report for analytical purposes only and is subject to change at the detailed design phase.



## 2.0 RESPONSES TO CITY COMMENTS

### A. REVISIONS TO PLANS AND ADDITIONAL INFORMATION REQUIRED FOR PLANS, STUDIES AND DRAWINGS

#### Transportation Services

**Comment 1.1:** Review the feasibility of providing the proposed private street (Street G) as a public right-of-way with a minimum width of 15.0 metres, as per the originally approved Subdivision plan. Be advised: the proposed right-of-way must be revised to include 2.1 metre wide pedestrian clearways on both sides;

**Response:** Street 'G' is now proposed as a public street with a 15 metre right-of-way. Please refer to architectural plans provided in Appendix A. Pedestrian clearways of 2.1m are provided on both sides of the street.

**Comment 1.2:** For Phase 3 of the proposal (e.g. the blocks between Sumach Street and River Street), and in consultation with Cycling and Pedestrian Projects, and City Planning/Urban Design, provide a preliminary design for the bi-directional bikeway along Gerrard Street East, noting the following specifications:

- a) A raised two-way cycle track of 3.0 metres in width with:
  - A buffer zone between the roadway and the cycle track between 0.8-1.0 metres;
  - A buffer zone between the cycle track and pedestrian clearway/sidewalk between 0.6-0.8 metres;
- b) A minimum of two (2) vehicle lanes (configuration to be determined) for the west leg approach to River Street;
- c) A TTC transit platform in accordance with the June 2022 design specifications (pending consultation with TTC with regards to the location of transit stops);
- d) Crossing conditions at the signalized intersections along Gerrard Street East in accordance with Ontario Traffic Manual Book 18 – Protected Intersections;

**Response:** An assessment of the Gerrard Street bikeway will be provided under separate cover.

**Comment 1.3:** Provide a traffic sensitivity analysis for the potential closure of the eastbound curb lane along Gerrard Street East (e.g. the reduction to one [1] through-lane) and reviewing potential lane configurations at the public road intersections (in particular at River Street); and

**Response:** The sensitivity analysis for Gerrard Street East will be addressed in a future submission.

**Comment 1.4:** Re-locate the proposed access driveways on River Street and/or consolidate the proposed vehicular and loading access driveways on River Street to be provided via one (1) curb cut, as further discussed in this memorandum.

**Response:** The current plans show one (1) loading driveway onto River Street. The driveway to the Block 5 (formerly named Block 4) parking facilities has now been relocated to the Tubman Avenue Extension.

#### Solid Waste Services

**Comment 2.1:** Revise drawings to indicate and annotate the following with regard to the Multi-Residential Component:

- a) The Type G loading space is 13 metres in length, 4 metres in width



- b) *The staging pad abutting the front of the Type G loading space will be at least*
  - i. *Building 1A – 20.1 square metres*
  - ii. *Building 1C – 71.3 square meters*
  - iii. *Building 2E – 50.5 square metres*
  - iv. *Building 2I – 33.3 square metres*
  - v. *Building 3K – 65.7 square metres*
  - vi. *Building 4M – 65.9 square metres*
- c) *A bulky storage area of minimum floor area of at least 10 square metres. It is encouraged to locate this within or with direct access to the loading area.*
- d) *A garbage storage room with a minimum floor area based on the number of units. Buildings with multiple waste rooms due to towers or other reasons will require appropriately sized waste storage rooms based on the total number of units associated with them. Detailed breakdown of units required to provide minimum requirements for waste storage room.*
- e) *All overhead doors have a minimum vertical clearance of 4.4 metres, and a minimum width of 4 metres.*

**Comment 2.2:** *Revise drawings to indicate and annotate the following with regard to the Non-Residential Component:*

- a) *A storage space for the waste that will be generated by the non-residential component of this development. This non-residential waste room must be independent from the residential waste room and must be accessible without entering the residential waste room.*

**Comment 2.3:** *Revise drawings to indicate and annotate the following with regard to the Toronto Public Library Collection:*

- a) *A waste storage area that located within the building and is at least 12 square meters, but may need to be larger to allow storage of all waste material between collection days.*

**Comment 2.5:** *Show on the drawings that all access driveways to be used by the collection vehicle will have:*

- a) *A maximum gradient of 8%;*
- b) *A minimum vertical clearance of 4.4 metres throughout;*
- c) *A minimum width of 4.5 metres throughout; and,*
- d) *6 metres wide at point of ingress and egress.*

**Responses:** The architectural plans have been prepared at a rezoning level and generally comply with these requirements. The design of each building will be further developed through the Site Plan Application process, and these elements will be incorporated into each building plan.

## **B. (PRELIMINARY) ZONING BY-LAW AMENDMENT CONDITIONS**

**Comment 1.1:** *Provide and maintain parking spaces in accordance with the requirements of Zoning By-law No. 89-2022 (amended as No. 125-2022) for Parking Zone A.*



**Response:** The revised parking requirement calculations based on By-law 89-2022 and the currently proposed parking strategy is provided in **Section 4.0**.

**Comment 1.2:** Provide and maintain accessible parking spaces in accordance with the requirements of Zoning By-law No. 89-2022 (amended as No. 125-2022) for Parking Zone A, with minimum dimensions to be provided in accordance with Zoning By-law No. 579-2017.

**Response:** Noted.

**Comment 1.3:** The overall development site is required to provide a minimum number of publically accessible car-share spaces within each block. This total is to be determined, as noted in Section A.

**Response:** Noted.

**Comment 1.4:** Include the following definitions in the Site-Specific By-law for this project:

- a) *Car-share* means the practice where a number of people share the use of one or more cars that are owned by a profit or non-profit car-sharing organization and where such organization may require that use of cars to be reserved in advance, charge fees based on time and/or kilometers driven, and set membership requirements of the car-sharing organization, including the payment of a membership fee that may or may not be refundable;
- b) *Car-share parking space* means a parking space that is reserved and actively used for car-sharing.

**Response:** Noted.

**Comment 1.5:** Provide and maintain loading spaces in accordance with the following minimums and with dimensions as per Zoning By-law No. 569-2013:

*For Block/Phase 1:*

- a) Two (2) Type G spaces;
- b) Two (2) Type B spaces;

*For Block/Phase 2:*

- a) Two (2) Type G spaces;
- b) Two (2) Type B spaces;

*For Block/Phase 3:*

- a) Two (2) Type G spaces; and
- b) Two (2) Type B spaces.

**Response:** It is noted that there are now five (5) blocks in the plan. The proposed revised loading requirements are summarized in **Section 6.0**.



### 3.0 STREET NETWORK & BLOCK DESIGN UPDATES

The Regent Park Revitalization Plan for Phases 4 and 5 includes a reconfiguration of streets located within or adjacent to the Site in order to foster a more complete, balanced, and connected network. Streets that are currently privately-owned (i.e. Sackville Street and Sumach Street) will become public streets. The functional road plan is provided in **Appendix B**.

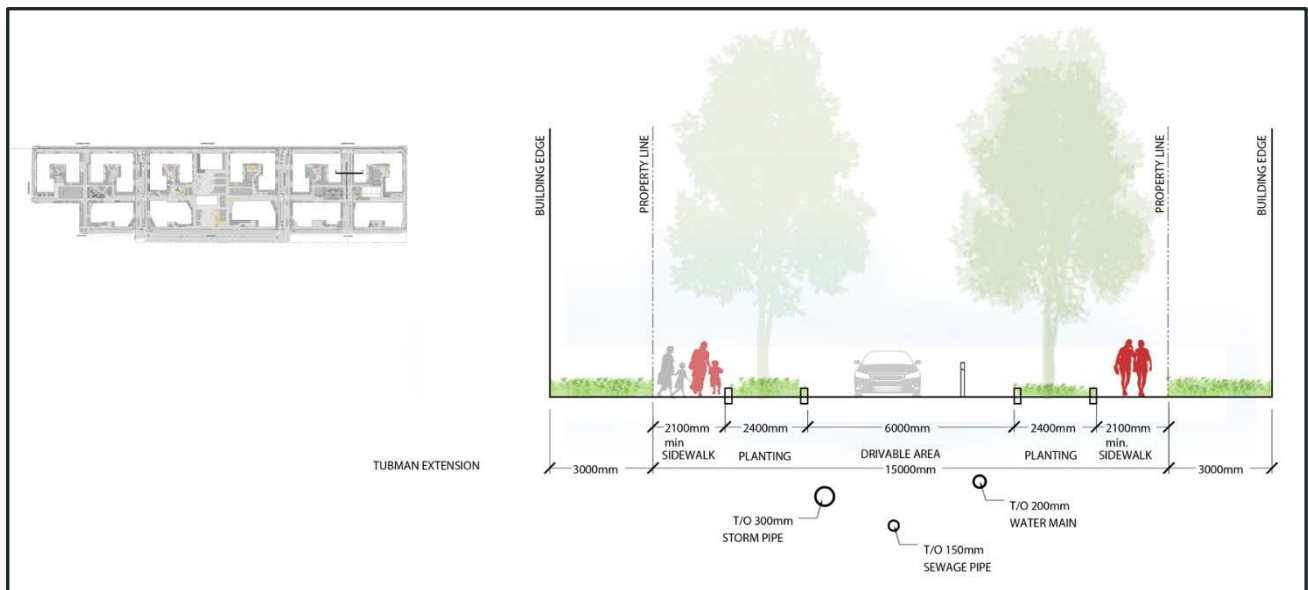
While key street design objectives remain the same as the previous submission, several road network changes listed below are now proposed. These further enhance connectivity within the plan.

Some changes have been made since the original submission, through the addition of new public streets (Tubman Avenue Extension and Street 'G') and modifications to Oak Street to allow for better circulation through Regent Park Phases 4 and 5 and improve pedestrian connectivity.

#### 3.1 TUBMAN AVENUE EXTENSION (STREET 'J')

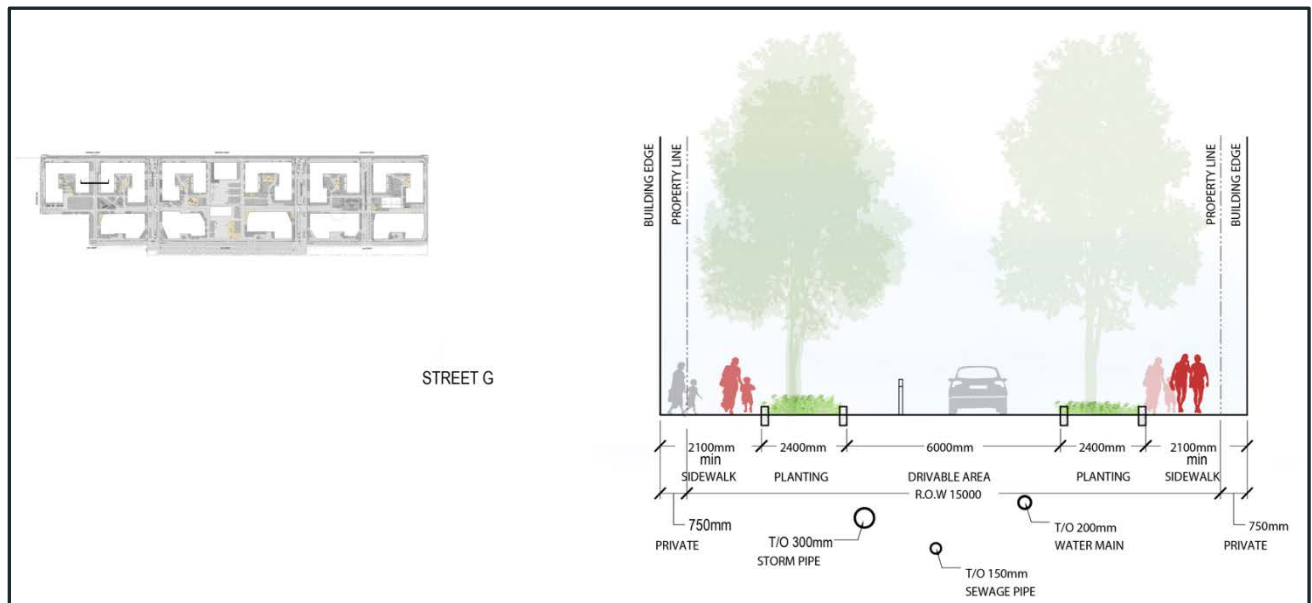
A public street extension of Tubman Avenue (Street 'J') is proposed between Gerrard Street East in the north to Oak Street in the south. The street will have a 15.0m right-of-way, including a 4.5m one-way southbound vehicle travel lane, a 1.5m paved buffer and a 2.0m parking lay-by. The paved buffer has been provided on the east side of the street to reduce the travel width the vehicular lanes and provide additional space for active travel modes. Sidewalks are provided on both sides of the street. Table tops (elevated crossings) are proposed at key pedestrian junctures mid-block as illustrated in the Landscape plan to facilitate east-west pedestrian travel within Phases 4 and 5. These also serve to reduce traffic speeds along these pedestrian focussed streets.

The fire route comprises of the 4.5m travel lane and the 1.5m paved buffer. These areas are separated by bollards. These dimensions accommodate the travel path of a fire truck and permit the fire truck to activate the stabilizing legs between the bollards as shown in the vehicle manoeuvring diagrams VMD-08 to VMD-10 provided in **Appendix E**.



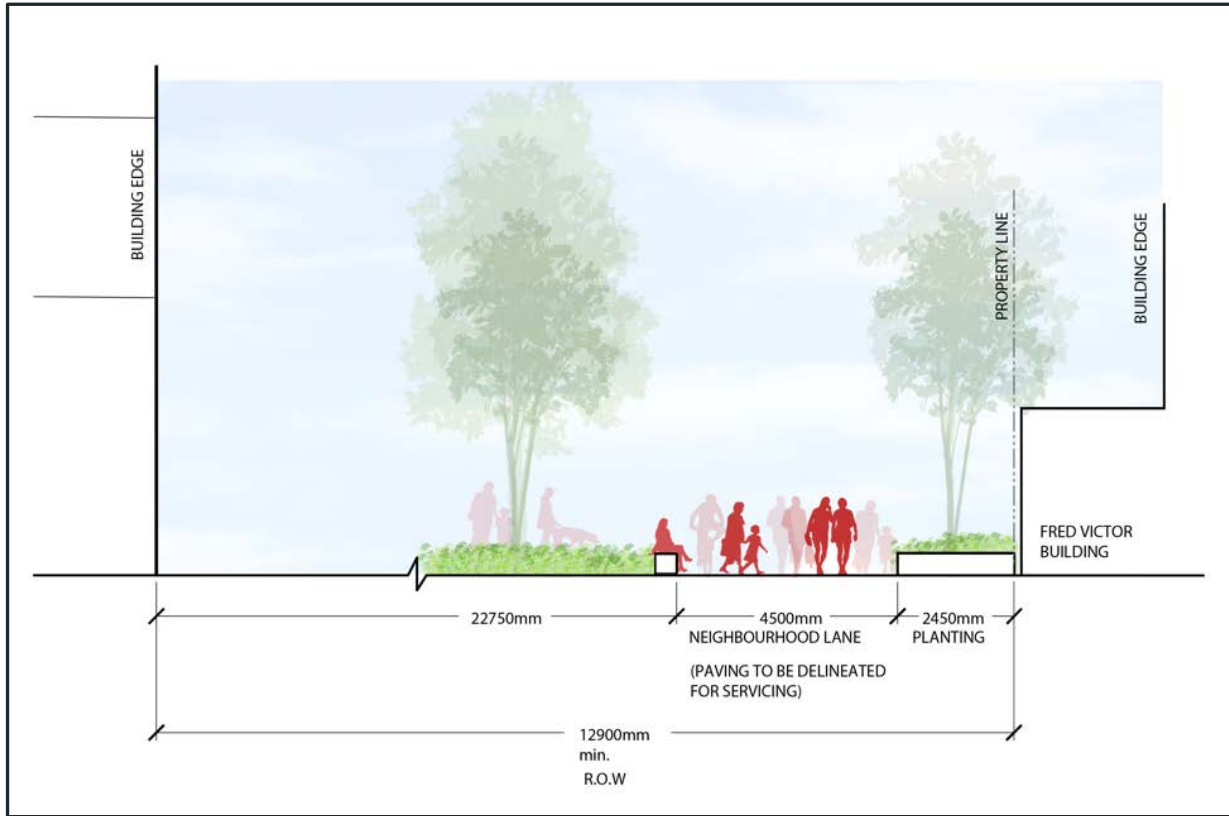
### 3.2 STREET 'G'

A new north-south public street between public street (Street 'G') is proposed between Gerrard Street East in the north to Oak Street in the south. The street will have a 15.0m right-of-way, including a 4.5m one-way southbound vehicle travel lane, a 1.5m paved buffer and a 2.0m parking lay-by. The paved buffer has been provided on the east side of the street to reduce the travel width the vehicular lanes and provide additional space for active travel modes. Sidewalks are provided on both sides of the street. Table tops (elevated crossings) are proposed at key pedestrian junctures mid-block as illustrated in the Landscape plan to facilitate east-west pedestrian travel within Phases 4 and 5. These also serve to reduce traffic speeds along these pedestrian focussed streets.



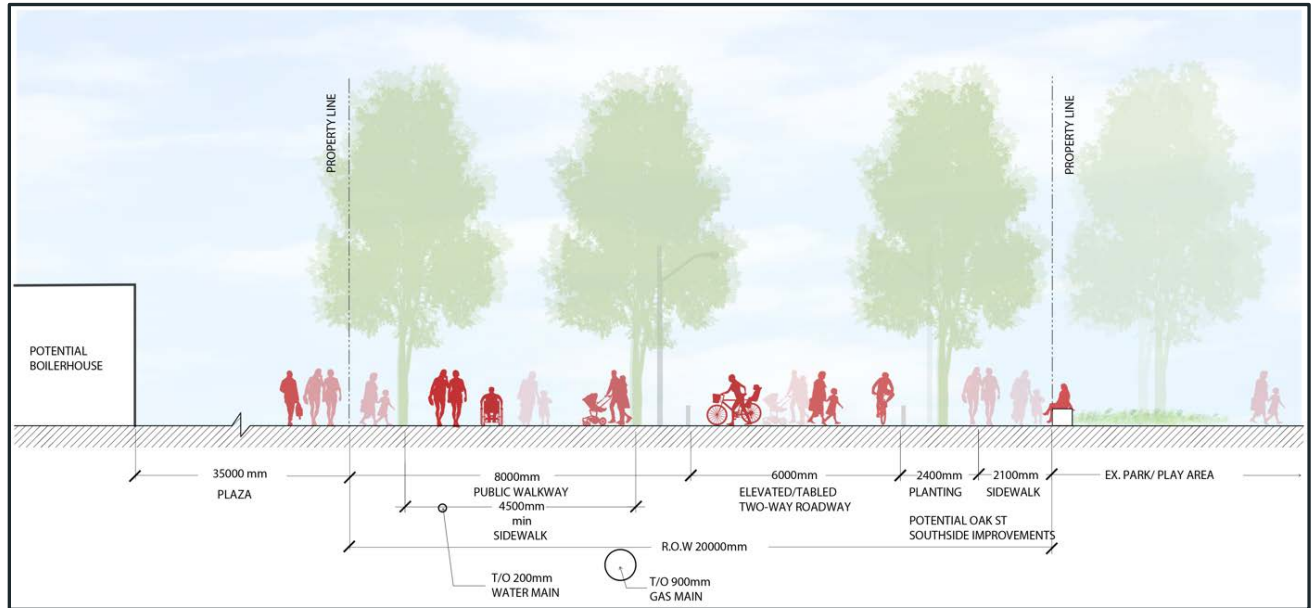
### 3.3 FRED VICTOR SERVICING LANE

A new east-west driveway extending from Dreamers Way to the new private north-south street is also proposed. It has a width of 4.5m and is intended to operate one-way eastbound, to facilitate loading operations associated with the Fred Victor Building. This connection is shown in the Functional Road plan in **Appendix B**.



### 3.4 OAK STREET

Oak Street between Parliament Street and Sackville Street and Tubman Avenue and River Street would largely remain the same as under existing conditions. Oak Street between Sackville Street and Sumach Street is proposed to be modified to have a 6m pavement width to allow for additional landscaping and boulevard elements.



Between Sumach Street and Tubman Avenue, it is proposed to convert this segment from one-way eastbound to two-way. This allows for easier navigation through Block 5. The block under this condition can be circled through a clockwise loop (i.e. right turns), to provide better connectivity between development blocks and the area streets (Sumach Street, Gerrard Street East and by extension Sackville Street) with less delay.



## 4.0 VEHICULAR PARKING CONSIDERATIONS

### 4.1 VEHICULAR PARKING SPACE REQUIREMENTS

#### 4.1.1 Current Zoning Considerations

The Site (and much of its surrounding area) is not under the jurisdiction of current comprehensive City of Toronto Zoning By-law 569-2013; it is under the jurisdiction of former City of Toronto Zoning By-law 438-86. Area-specific By-law 141-2005 was carried forward and maintained as “Exceptions Applying to Specific Use Districts or Specific Lands” in Zoning By-law 438-86, while Area-specific By-law 275-2014 was passed in implementation of the City of Toronto Secondary Plan for the Regent Park Area.

The relevant Site-specific minimum parking requirements for the Site are the following:

- Residential: requirements outlined in By-law 275-2014
- Residential Visitor: requirements outlined in By-law 141-2005
- Social Housing: requirements outlined in By-law 141-2005
- Social Housing Visitor: By-law 141-2005 states that no visitor parking spaces shall be required in respect of dwelling units which are social housing building
- Office: requirements outlined in Zoning By-law 438-86 (Downtown Parking and Loading Zone)
- Retail: requirements outlined in Zoning By-law 438-86 (Downtown Parking and Loading Zone)
- Community/Culture Uses: requirements outlined in Zoning By-law 438-86 (Downtown Parking and Loading Zone)
- Library Uses: requirements outlined in Zoning By-law 438-86 (Downtown Parking and Loading Zone)

#### 4.1.2 Minimum Vehicular Parking Requirements

The minimum parking space supply requirement for the entirety of Phases 4 and 5, in aggregate, is outlined in **Table 2** based upon the currently applicable minimum parking requirements. Minimum parking space requirements, per block, are included in **Appendix C**.

Application of the minimum parking requirements associated with Zoning By-law 438-86 and the area-specific parking requirements results in a total Site parking requirement of 1,708 parking spaces after the application of time-of-day sharing factors.



**TABLE 2 PHASES 4 & 5 ZONING BY-LAW MINIMUM PARKING REQUIREMENTS (IN AGGREGATE)**

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
<b>Residential</b>						
1-Bedroom (Market)	1,371 units	0.41 spaces per unit	561 spaces	100%	100%	100%
2-Bedroom (Market)	477 units	0.58 spaces per unit	277 spaces			
3-Bedroom (Market)	128 units	1.04 spaces per unit	133 spaces			
Affordable Housing	1,270 units	0.40 spaces per unit	508 spaces			
<b>Resident Sub-Total</b>	<b>3,246 units</b>	<b>0.46 spaces per unit (blended)</b>	<b>1,479 spaces</b>	<b>1,479</b>	<b>1,479</b>	<b>1,479</b>
<b>Non-Residential</b>						
Market Residential Visitors	1,976 units	0.06 spaces per unit	119 spaces	0 0%	41 35%	119 100%
Affordable Housing Residential Visitors	1,270 units	0.00 spaces per unit	0 spaces	0 0%	0 35%	0 100%
Community	3,714 sm GFA	1 spaces / 175 sm GFA	20 spaces	5 25%	20 100%	20 100%
Library	2,277 sm GFA	1 spaces / 175 sm GFA	13 spaces	13 100%	13 100%	13 100%
Culture	405 sm GFA	1 spaces / 175 sm GFA	2 spaces	2 100%	2 100%	2 100%
Office	2,511 sm GFA	1 spaces / 300 sm GFA	8 spaces	8 100%	7 60%	0 0%
Retail	7,545 sm GFA	1 spaces / 100 sm GFA	75 spaces	14 20%	75 100%	75 100%
<b>Non-Resident Sub-Total</b>			<b>237 spaces</b>	<b>42</b>	<b>158</b>	<b>229</b>
<b>TOTAL</b>			<b>1,716 spaces</b>	<b>1,521</b>	<b>1,637</b>	<b>1,708</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Calculation of required parking supply is not directly based on the minimum parking requirement rates in **Table 2**; it is the aggregate of the calculation of minimum parking requirements for each block, as outlined in **Appendix C**.





### 4.1.3 Zoning By-law 89-2022 Parking Supply Requirements

Based on comment provided by City staff, the parking requirements resulting from Zoning By-law 569-2013, as amended by 89-2022, are also evaluated. By-laws 89-2022 and 125-2022 were passed (and now in effect as of October 12, 2022) by City Council in February 2022 to amend the vehicle parking requirements outlined in the current City of Toronto Zoning By-law 569-2013. These standards generally aim to improve the efficiency and effectiveness of local parking as the City continues to evolve. The formation of this By-law (e.g. turning minimum requirements into maximum requirements for all land uses) reflects the City's direction and intent to replace the minimum requirements of in-force Zoning By-law 569-2013, making other existing Former Zoning By-laws generally outdated.

The Site falls under Parking Zone 'A' boundaries, as governed by Zoning By-law 89-2022 (as amended by Zoning By-law 125-2022). Application of minimum and maximum parking requirements to the Site is summarized in **Table 3**. It is notable that no minimum parking spaces are required for residents, with exception to accessible parking spaces discussed in **Section 4.1.4.2**. Visitor spaces are required, but only for market buildings.

Under By-law 89-2022, the Site development requires a minimum of 54 accessible parking spaces, inclusive of 25 accessible residential visitor parking spaces and remainder distributed equitably between the proposed uses.



**TABLE 3 BY-LAW 89-2022 MINIMUM AND MAXIMUM PARKING REQUIREMENTS (INCLUDING ACCESSIBLE PARKING)**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum Parking Required <sup>3</sup> (Spaces)	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>3</sup> (Spaces)	Effective Parking Required (Ratio)	Effective Parking Required <sup>3,4</sup> (Spaces)
<b>Residential</b>							
Bachelor	0	None	0	0.30 spaces per unit	0	0.30 spaces per unit	0
1-Bedroom	1,371 units	None	0	0.50 spaces per unit	685	0.50 spaces per unit	685
2-Bedroom	477 units	None	0	0.80 spaces per unit	380	0.80 spaces per unit	380
3-Bedroom	128 units	None	0	1.00 spaces per unit	128	1.00 spaces per unit	128
Affordable Housing <sup>1</sup>	1,270 units	None	0	0.50 spaces per unit	634	0.20 spaces per unit	252
<b>Resident Sub-Total</b>	<b>3,246 units</b>	<b>None</b>	<b>0</b>	<b>0.56 spaces per unit (blended)</b>	<b>1,827</b>	<b>0.45 spaces per unit (blended)</b>	<b>1,445</b>
<b>Non-Residential</b>							
Market Residential Visitors	1,976 units	2 plus 0.01 spaces per unit	25	5 plus 0.10 spaces per unit	212	0.10 spaces per unit	197
Affordable Housing Residential Visitors <sup>2</sup>	1,270 units	None	0	None	0	None	0
Community	3,714 sm GFA	None	0	0.80 spaces per 100 sm GFA	28	0.40 spaces per 100 sm GFA	13
Library	2,277 sm GFA	None	0	3.50 spaces per 100 sm GFA	79	1.00 spaces per 100 sm GFA	22
Culture	405 sm GFA	None	0	0.80 spaces per 100 sm GFA	3	0.40 spaces per 100 sm GFA	1
Office	2,511 sm GFA	None	0	0.80 spaces per 100 sm GFA	17	0.40 spaces per 100 sm GFA	7
Retail	7,545 sm GFA	None	0	3.50 spaces per 100 sm GFA	261	1.00 spaces per 100 sm GFA	73
<b>Non-Resident Sub-Total</b>		<b>--</b>	<b>25</b>	<b>--</b>	<b>600</b>	<b>--</b>	<b>313</b>
<b>TOTAL</b>		<b>--</b>	<b>25</b>	<b>--</b>	<b>2,427</b>	<b>--</b>	<b>1,758</b>
<b>Adjusted Minimum Parking Requirement<sup>5</sup></b>							
<i>54 accessible parking spaces.</i>							<b>54</b>

Notes:

- By-law 89-2022 does not specify parking requirements for affordable housing uses. Instead, parking rates that were provided for alternative housing uses within the By-law were assumed to best represent the proposed affordable housing uses.
- Visitor parking spaces are not required under By-law 89-2022 for alternative housing uses on the Site.
- Refer to Table 200.5.10.1 of By-law 89-2022. If the number of required parking spaces results in a number with a fraction, the number is rounded down to the nearest whole number but there may not be less than one parking space.
- Refer to Table 200.15.10.5 of By-law 89-2022. Application of "Effective" Parking Ratio and Requirement is a procedural requirement, stipulated by By-law 89-2022, intended to calculate the required quantity of parking spaces to only be used for determining the minimum number of accessible parking spaces required.
- Based on Section 200.15.10.10 of By-law 89-2022.
- Calculation of required parking supply is not directly based on the minimum parking requirement rates in **Table 3**; it is the aggregate of the calculation of minimum parking requirements for each block, as outlined in **Appendix C**.



#### 4.1.4 Proposed Vehicular Parking Supply

Within the architectural plans (see **Appendix A**), vehicular parking has been provided in accordance with the following rates:

##### Market Housing Blocks:

- Residents: 0.40 spaces per unit
- Residential visitors: 0.06 spaces per unit (to be provided on a shared, non-exclusive basis with parking for non-residential uses)
- Non-residential uses: no dedicated parking

##### Affordable Housing / Municipal Blocks:

- Residents: 0.40 spaces per unit
- Residential visitors: no parking
- Non-residential uses: no parking

Notably, the proposed parking supply is compliant with Zoning By-law 569-2013, as amended by Zoning By-laws 89-2022 and 125-2022. The proposed parking supply is greater than the minimum parking requirement and lesser than the maximum parking requirement.

The provided parking supply for the entirety of Phases 4 and 5, in aggregate, is outlined in **Table 4** based upon the application of the above parking supply rates. The proposed parking supply, per block, is included in **Appendix C**.

Application of the parking supply rates results in a total Site parking supply of 1,417 parking spaces. The site is seeking to provide 1,417 parking spaces.

##### 4.1.4.1 Non-Standard Parking Spaces

It is expected at this time that several parking spaces (number to be determined at the Site Plan Approval stage of the development process) within the proposed parking garages will not meet the parking space dimensional requirements of City of Toronto Zoning By-laws 438-86 and 569-2013.

The relevant and basic parking space dimensional requirements are 2.6 metres in width, 5.6 metres in length, 2.0 metres in height, and be accessed by a 6.0 metre drive aisle.

Parking spaces that do not meet all of the above requirements will be small car / obstructed parking spaces. As building plans will adapt to respond to City comments and the acceleration of the design process, the number of small car / obstructed spaces will change. It is expected that the number of obstructed parking spaces will not exceed 10% of the total parking space supply within the parking garages. The small car / obstructed parking spaces will be reviewed to determine functionality; this analysis will be conducted in conjunction with a subsequent submission associated with the project.



**TABLE 4 PHASES 4 & 5 PARKING SUPPLY (IN AGGREGATE)**

Use / Type	# of Units / GFA	Proposed Parking Supply (Ratio)	Proposed Parking Supply (Spaces)	Shared Parking		
				AM	PM	Evening
<b>Residential</b>						
All Market Units	1,976 units	0.40 spaces per unit	790 spaces	100%	100%	100%
All Affordable Units	1,270 units	0.40 spaces per unit	508 spaces			
<b>Resident Sub-total</b>	<b>3,246 units</b>	<b>0.40 spaces per unit</b>	<b>1,298 spaces</b>	<b>1,298</b>	<b>1,298</b>	<b>1,298</b>
<b>Non-Residential</b>						
Market Residential Visitors	1,976 units	0.06 spaces per unit	119 spaces	0 0%	41 35%	119 100%
Affordable Housing Residential Visitors	1,270 units	No parking	0 spaces	0 0%	0 35%	0 100%
Community	3,714 sm GFA	No parking	0 spaces	0 25%	0 100%	0 100%
Library	2,277 sm GFA	No parking	0 spaces	0 100%	0 100%	0 100%
Culture	405 sm GFA	No parking	0 spaces	0 100%	0 100%	0 100%
Office	2,511 sm GFA	No parking	0 spaces	0 100%	0 60%	0 0%
Retail	7,545 sm GFA	No parking	0 spaces	0 20%	0 100%	0 100%
<b>Non-Resident Sub-Total</b>			<b>119 spaces</b>	<b>0</b>	<b>41</b>	<b>119</b>
<b>TOTAL</b>			<b>1,417 spaces</b>	<b>1,298</b>	<b>1,339</b>	<b>1,417</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Calculation of proposed parking supply is not directly based on the minimum parking requirement rates in **Table 4**; it is the aggregate of the calculation of minimum parking requirements for each block, as outlined in **Appendix C**.

#### 4.1.4.2 Accessible Parking Supply

Greater detail pertaining to accessible parking supply and functionality will be provided in subsequent redevelopment applications. It is intended for the Site to meet the accessible parking supply requirements of City of Toronto By-law 89-2022 for each Block, provided that parking supply is provided for a use on the block.

#### 4.1.4.3 Electric Vehicle Parking

As part of the Site's Sustainability Strategy, the Proposed Development will meet Toronto Green Standard (TGS) Version 4 (V4). For electric vehicle parking, City of Toronto By-law 89-2022 further updated requirements. As a result, all resident parking spaces (1,298 parking spaces) and 25% of non-resident parking spaces (25% of 119 = 30 parking spaces) will include an energized outlet capable of providing Level 2 charging or higher to the parking space. For the 75% of non-resident parking spaces omitted from the above, rough-in conduits will be provided to permit future Electric Vehicle Supply Equipment (EVSE) installation.



## 5.0 BICYCLE PARKING CONSIDERATIONS

### 5.1 BICYCLE PARKING REQUIREMENTS

As previously noted, the Site is not under the jurisdiction of the Zoning By-law 569-2013, but rather the former Zoning By-law 438-86. The minimum bicycle parking requirements of Zoning By-law 438-86 are applicable to the Site. However, the Toronto Green Standards (TGS) Version 4.0 (V4) for Zone 1 (Tier 1) bicycle parking standards (which are based upon Zoning By-law 569-2013) represent a more progressive approach, and as such have been applied to the development.

The Site is designated as Bicycle Zone 1 under Zoning By-law 569-2013, which sets the minimum bicycle parking requirements for developments located within the zone. These bicycle parking requirements are consistent with the minimum bicycle parking requirements of the Toronto Green Standards (TGS) Version 4, Tier 1 that apply to all developments within the City of Toronto.

#### 5.1.1 Minimum Bicycle Parking Requirements

The minimum bicycle parking space supply requirement for the entirety of Phases 4 and 5, in aggregate, is outlined in **Table 5** based upon the applicable minimum bicycle parking requirements. Minimum bicycle parking space requirements, per block, are included in **Appendix D**.

Application of the minimum bicycle parking requirements associated with TGS V4 Tier 1 (which are based upon Zoning By-law 569-2013) results in a total Site requirement of 3,354 bicycle parking spaces.

**TABLE 5 PHASES 4 & 5 ZONING BY-LAW MINIMUM BICYCLE PARKING REQUIREMENTS (IN AGGREGATE)**

Use / Type	Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	3,246 units	Long-Term	0.90 spaces per unit	2,923 spaces
		Short-Term	0.10 spaces per unit	328 spaces
Community	3,714 sm GFA	Total	--	0 spaces
Library	2,277 sm GFA	Total	--	0 spaces
Culture	405 sm GFA	Total	--	0 spaces
Office	2,511 sm GFA	Long-Term	0.2 spaces per 100 sm GFA	8 spaces
		Short-Term	3 plus 0.2 spaces per 100 sm GFA	29 spaces
Retail	7,545 sm GFA	Long-Term	0.2 spaces per 100 sm GFA	19 spaces
		Short-Term	3 plus 0.3 spaces per 100 sm GFA	47 spaces
<b>Long-Term Subtotal</b>				<b>2,950 spaces</b>
<b>Short-Term Subtotal</b>				<b>404 spaces</b>
<b>TOTAL</b>				<b>3,354 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. In addition to the standards listed, the Toronto Green Standards require all short-term bicycle parking to be located in a highly visible location or at-grade or on the first parking level below-grade.
3. Calculation of required bicycle parking supply is not directly based on the minimum parking requirement rates in **Table 5**; it is the aggregate of the calculation of minimum parking requirements for each block, as outlined in **Appendix D**.



### 5.1.2 Proposed Bicycle Parking Supply

In comparison to the aforementioned minimum bicycle parking requirements, it is proposed to provide a bicycle parking supply that exceeds the requirements, as outlined in **Table 6** and as outlined in the architectural plans (**Appendix A**).

Bicycle parking has been provided in accordance with the following rates:

- Residential (Long-Term): 1.00 spaces per unit
- Residential (Short-Term): 0.16 spaces per unit
- Non-Residential Uses (Long-Term & Short-Term): 0.75 spaces per 100 m<sup>2</sup> GFA

The application of the rates, in aggregate across the Site, results in the provision of 3,890 bicycle parking spaces inclusive of 3,245 long-term residential bicycle parking spaces, 522 short-term residential bicycle parking spaces, and 123 non-residential bicycle parking spaces.

**TABLE 6 PROPOSED BICYCLE PARKING SUPPLY (IN AGGREGATE)**

Use / Type	Units / GFA	Type	Proposed Parking Supply (Ratio)	Proposed Parking Supply (Spaces)
Residential	3,246 units	Long-Term	1.00 spaces per unit	3,245 spaces
		Short-Term	0.16 spaces per unit	522 spaces
Non-Residential	16,452 sm GFA	Long-Term & Short-Term	0.75 spaces per 100 sm GFA	123 spaces
<b>TOTAL</b>				<b>3,890 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.

#### 5.1.2.1 Bicycle Parking Location

As part of the Site's Sustainability Strategy, the Proposed Development will meet Toronto Green Standard (TGS) Version 4 (V4). To meet the requirements, all long-term bicycle parking, within all blocks, will be provided in a secure controlled-access bicycle parking facility or purpose-built bicycle locker on the first or second storey of the building or on levels below ground commencing with the first level below ground. All short-term bicycle parking, within all blocks, will be provided in a highly visible and publicly accessible location at-grade or on the first parking level of the building below grade.

#### 5.1.2.2 Electric Bicycle Parking

As part of the Site's Sustainability Strategy, the Proposed Development will meet Toronto Green Standard (TGS) Version 4 (V4). To meet the requirements, at least 15% of required long-term bicycle parking (2,950 long-term spaces x 15% = 443 bicycle parking spaces) will include an energized outlet (120 V) adjacent to the bicycle parking space.



## 6.0 LOADING CONSIDERATIONS

### 6.1 LOADING REQUIREMENTS

#### 6.1.1 Zoning Considerations

As previously noted, the Site (and much of its surrounding area) is not under the jurisdiction of current comprehensive City of Toronto Zoning By-law 569-2013; it is under the jurisdiction of former City of Toronto Zoning By-law 438-86. The minimum loading requirements of contemporary City of Toronto Zoning By-law 569-2013 are also considered within this section.

The library and community facilities in Block 2F (and 2G) have been conceptually shown in the plans. The programming and design of the facilities will be refined as part of the Site Plan Control Application process. Therefore, consideration of a future loading facility is not included in this report and as part of this application.

#### 6.1.2 Minimum Loading Requirements – ZBL 438-86

The minimum loading requirements for each development block in Phases 4 and 5, based upon Zoning By-law 438-86, is outlined in **Table 7**.

Application of the minimum loading requirements associated with Zoning By-law 438-86 results in a total requirement of 9 loading spaces for the entire Site after the application of sharing factors.



**TABLE 7 BUILDING 1A ZONING BY-LAW 438-86 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	274 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	1,395 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Office	270 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	809 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Section 4.8(d).
2. Shared Loading Calculations based on Section 4.8(e).

**TABLE 8 BUILDINGS 2B AND 2C ZONING BY-LAW 438-86 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	731 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	0 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Office	334 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	1,001 sm GFA	0 spaces	2 spaces	0 spaces	0 spaces	2 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>2 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Section 4.8(d).
2. Shared Loading Calculations based on Section 4.8(e).

**TABLE 9 BUILDINGS 3D AND 3E ZONING BY-LAW 438-86 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	520 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	0 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Office	554 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Retail	1,663 sm GFA	0 spaces	2 spaces	0 spaces	0 spaces	2 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>2 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Section 4.8(d).
2. Shared Loading Calculations based on Section 4.8(e).





**TABLE 10 BUILDINGS 3H AND 3I ZONING BY-LAW 438-86 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	343 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	605 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Office	416 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	1,247 sm GFA	0 spaces	2 spaces	0 spaces	0 spaces	2 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>2 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Section 4.8(d).
2. Shared Loading Calculations based on Section 4.8(e).

**TABLE 11 BUILDINGS 4J AND 4K ZONING BY-LAW 438-86 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	725 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	0 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Office	324 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	971 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Section 4.8(d).
2. Shared Loading Calculations based on Section 4.8(e).

**TABLE 12 BUILDINGS 5L AND 5M ZONING BY-LAW 438-86 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	653 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	955 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Office	238 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	715 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Section 4.8(d).
2. Shared Loading Calculations based on Section 4.8(e).



### 6.1.3 Minimum Loading Requirements – ZBL 569-2013

The minimum loading requirements for each development block in Phases 4 and 5, based upon Zoning By-law 569-2013, is outlined in **Table 13**.

Application of the minimum loading requirements associated with Zoning By-law 569-2013 results in a total requirement of 10 loading spaces after the application of sharing factors.

**TABLE 13 BUILDING 1A ZONING BY-LAW 569-2013 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	274 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	1,395 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Office	270 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	809 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Chapter 220.5.10.1(9).
3. Shared Loading Calculations based on Section 40.10.90.1.

**TABLE 14 BUILDINGS 2B AND 2C ZONING BY-LAW 569-2013 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	731 units	0 spaces	0 spaces	1 spaces	1 spaces	2 spaces
Community	0 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Office	334 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	1,001 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Chapter 220.5.10.1(9).
3. Shared Loading Calculations based on Section 40.10.90.1.



**TABLE 15 BUILDINGS 3D AND 3E ZONING BY-LAW 569-2013 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	520 units	0 spaces	0 spaces	1 spaces	1 spaces	2 spaces
Community	0 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Office	554 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Retail	1,663 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Chapter 220.5.10.1(9).
3. Shared Loading Calculations based on Section 40.10.90.1.

**TABLE 16 BUILDINGS 3H AND 3I ZONING BY-LAW 569-2013 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	343 units	0 spaces	0 spaces	0 spaces	1 spaces	1 spaces
Community	605 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	0 spaces
Office	416 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	1 spaces
Retail	1,247 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Chapter 220.5.10.1(9).
3. Shared Loading Calculations based on Section 40.10.90.1.

**TABLE 17 BUILDINGS 4J AND 4K ZONING BY-LAW 569-2013 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	725 units	0 spaces	0 spaces	1 spaces	1 spaces	2 spaces
Community	0 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Office	324 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	971 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Chapter 220.5.10.1(9).
3. Shared Loading Calculations based on Section 40.10.90.1.



**TABLE 18 BUILDINGS 5L AND 5M ZONING BY-LAW 569-2013 MINIMUM LOADING REQUIREMENTS**

Use / Type	Units / GFA <sup>1</sup>	Type A Spaces	Type B Spaces	Type C Spaces	Type G Spaces	Total
Residential	653 units	0 spaces	0 spaces	1 spaces	1 spaces	2 spaces
Community	955 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
Office	238 sm GFA	0 spaces	0 spaces	0 spaces	0 spaces	0 spaces
Retail	715 sm GFA	0 spaces	1 spaces	0 spaces	0 spaces	1 spaces
<b>TOTAL (with sharing)<sup>2</sup></b>		<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>3 spaces</b>
<b>TOTAL (with sharing)<sup>3</sup></b>		<b>0 spaces</b>	<b>0 spaces</b>	<b>1 spaces</b>	<b>1 spaces</b>	<b>2 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023.
2. Shared Loading Calculations based on Chapter 220.5.10.1(9).
3. Shared Loading Calculations based on Section 40.10.90.1.

### 6.1.4 Proposed Loading Supply

Consolidated primary loading facilities are proposed for each development block included in the proposal with dedicated access off adjacent north-south streets (with the exception of Block 1A which is also serviced by a private laneway).

It is therefore proposed to modestly exceed the minimum loading requirements of Zoning By-law 569-2013 as outlined in **Table 19**.

**TABLE 19 PROPOSED LOADING SUPPLY BY BLOCK**

Block	Loading Supply			
	Type B	Type C	Type G	Total
Building 1A	-	-	1 space	1 space
Buildings 2B & 2C	1 spaces	-	1 space	2 spaces
Buildings 3D & 3E	1 spaces	-	1 space	2 spaces
Buildings 3H & 3I	1 spaces	-	1 space	2 spaces
Buildings 4J & 4K	1 spaces	-	1 space	2 spaces
Buildings 5L & 5M	1 spaces	-	1 space	2 spaces
<b>TOTAL</b>	<b>5 spaces</b>	<b>-</b>	<b>6 spaces</b>	<b>11 spaces</b>

Notes:

1. Development statistics based on architectural Site plans provided by Karakusevic Carson Architects, dated April 10, 2023. Blocks 3F & 3G are omitted.



For the entirety of Phases 4 and 5 in aggregate, a total supply of 11 loading spaces is proposed, inclusive of 5 Type B and 6 Type G loading spaces.

Vehicle manoeuvring is intended to be accommodated on-site such that vehicles can enter and exit each block in a forward motion. Vehicle manoeuvring diagrams for each block are included in **Appendix E**.

The staging area for each block has been sized to accommodate the minimum area required for the tower with the greatest number of residential units, based on City's "*Requirements For Garbage, Recycling And Organics Collection Services For New Developments and Redevelopments*" (March 2022).



## 7.0 VEHICULAR TRIP GENERATION UPDATE

Based on the updated development program, the resulting trip generation is summarized below in **Table 20**. The forecasting methodologies are analogous to those presented in the April 2022 TIS and the November 2022 addendum.

The Site is expected to generate in the order of 425 and 395 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively, representing an increase of 15 to 20 trips in the peak hours compared to the previous submission. The impacts of these additional trips distributed across the entire Site and study area road network are expected to be minimal, and are not expected to alter the conclusions of the vehicular traffic analysis.

**TABLE 20 VEHICULAR SITE TRIP GENERATION**

Use	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
<b>Current Submission</b>							
Residential	<i>Selected Person Trip Rate (trips / unit)</i>	0.05	0.45	0.50	0.30	0.15	0.45
	Person Site Trips (3,246 residential units)	160	1465	1625	975	485	1460
	Auto Site Trips (22% of total persons)	35	320	355	215	105	320
Non-Residential	<i>Selected Vehicle Trip Rate (trips / spaces)</i>	0.40	0.20	0.60	0.25	0.40	0.65
	Auto Site Trips (119 non-residential spaces)	45	25	70	35	40	75
<b>Total</b>	<b>Auto Site Trips</b>	<b>80</b>	<b>345</b>	<b>425</b>	<b>250</b>	<b>145</b>	<b>395</b>
<b>Previous Submission</b>							
Residential	Auto Site Trips	35	305	340	205	100	305
Non-Residential	Auto Site Trips	45	20	65	35	40	75
<b>Total</b>	<b>Auto Site Trips</b>	<b>80</b>	<b>325</b>	<b>405</b>	<b>240</b>	<b>140</b>	<b>380</b>
<b>Differences</b>							
Residential	Auto Site Trips	--	+15	+15	+10	+5	+15
Non-Residential	Auto Site Trips	--	+5	+5	--	--	--
<b>Total</b>	<b>Auto Site Trips</b>	<b>--</b>	<b>+20</b>	<b>+20</b>	<b>+10</b>	<b>+5</b>	<b>+15</b>

Notes:

- All trips are rounded to the nearest five (5).

## 8.0 TRAFFIC OPERATIONS ANALYSIS UPDATE

The traffic operations analysis provided in the following sections incorporate the increase in trip generation discussed in **Section 7.0**, and provides a review of the analysis resulting from both designs for Oak Street between Sumach Street and Sword Street (i.e., as one-way and two-way). The updated analysis in the sections below are based on the changes to the proposed road network previously discussed in **Section 3.0**.

### 8.1 ANALYSIS SCENARIOS

The following analysis scenarios were reviewed for the weekday morning and afternoon peak hours:

1. Baseline existing traffic conditions (volumes as illustrated in **Figure 3 of Appendix F**);
2. 2032 Future background traffic conditions on the existing road network (volumes as illustrated in **Figure 6 of Appendix F**);
3. 2032 Future background traffic conditions on base proposed road network (volumes as illustrated in **Figure 7 of Appendix F**);
4. 2032 Future total traffic conditions on base proposed road network (volumes as illustrated in **Figure 10 of Appendix F**);
5. 2032 Future total traffic conditions on sensitivity road network (volumes as illustrated in **Figure 12 of Appendix F**). This considers a further modification to Oak Street, to make a segment between Sumach Street and the Tubman Avenue Extension two-way to allow for better circulation. The lane configurations corresponding to the sensitivity road network are illustrated in **Figure 2**.

Future analysis scenarios are updated to incorporate the current plan that features two additional public streets between Oak Street and Gerrard Street East: Street 'G' and the extension of Tubman Avenue. These new streets create or modify the following intersections:

- **Oak Street / Street 'G'** – a new 3-way intersection would be created. It has been assumed for this analysis that the Street 'G' operates under STOP control. One-way northbound flow has been considered for Street 'G'.
- **Gerrard Street East / Street 'G'** - a new 3-way intersection would be created. It has been assumed that Street 'G' would operate under STOP control. One-way northbound flow has been considered for Street 'G'.
- **Street 'J' / Sword Street / Gerrard Street East** – the existing intersection would be updated to become a 4-way intersection. The south leg would be the Tubman Avenue Extension and operate one-way southbound. It is assumed that left turns from Gerrard Street East to the Tubman Avenue Extension would be permitted.
- **Tubman Avenue / Oak Street / Street 'J'** – the existing 3-way intersection would be updated to become a 4-way intersection. The north leg would be the proposed Tubman Avenue Extension. It has been assumed that the southbound Tubman Avenue Extension approach to the intersection would operate under STOP control.

All updated lane configurations and traffic volume figures are provided in **Appendix F**. All Synchro worksheets for the four scenarios above are provided in **Appendix G**.

## 8.2 SIGNALIZED INTERSECTION ANALYSIS

### 8.2.1 Parliament Street / Gerrard Street East

The intersection of Parliament Street / Gerrard Street East operates under signal control with variable cycle lengths in both peak hours due to the implementation of transit signal priority and phase extensions.

**Table 21** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.62 and 0.59 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.72 and 0.67 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no mitigation measures or improvements are recommended at this intersection.

**TABLE 21 PARLIAMENT STREET / GERRARD STREET EAST TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBLTR	0.28 (0.53)	B (C)	0.29 (0.56)	B (C)	0.29 (0.56)	B (C)	0.30 (0.58)	B (C)	0.30 (0.58)	B (C)
WBLTR	0.68 (0.37)	C (C)	0.70 (0.40)	C (C)	0.69 (0.42)	C (C)	0.73 (0.42)	C (C)	0.73 (0.42)	C (C)
NBLTR	0.40 (0.44)	B (B)	0.46 (0.50)	B (B)	0.46 (0.50)	B (B)	0.52 (0.56)	C (B)	0.52 (0.55)	C (B)
SBLTR	0.39 (0.54)	B (B)	0.41 (0.56)	B (B)	0.41 (0.56)	B (B)	0.41 (0.59)	B (B)	0.40 (0.59)	B (B)
<b>Overall</b>	<b>0.62 (0.59)</b>	<b>C (B)</b>	<b>0.67 (0.63)</b>	<b>C (C)</b>	<b>0.66 (0.64)</b>	<b>C (C)</b>	<b>0.72 (0.68)</b>	<b>C (C)</b>	<b>0.72 (0.67)</b>	<b>C (C)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).



## 8.2.2 Gerrard Street East / Sackville Street

The intersection of Gerrard Street East / Sackville Street operates under signal control with variable cycle lengths in both peak hours due to the implementation of transit signal priority and phase extensions.

**Table 22** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.43 and 0.50 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.54 and 0.50 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no other mitigation measures or improvements are recommended at this intersection, aside from the one-way configuration along Sackville Street.

**TABLE 22 GERRARD STREET EAST / SACKVILLE STREET TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTR	0.19 (0.48)	A (A)	0.19 (0.48)	A (A)	0.18 (0.48)	A (A)	0.19 (0.52)	A (A)	0.18 (0.52)	A (A)
WBLT	0.49 (0.32)	A (A)	0.50 (0.34)	A (A)	0.55 (0.37)	A (A)	0.62 (0.48)	A (A)	0.61 (0.48)	A (A)
NBLTR	0.02 (0.02)	B (B)	0.02 (0.03)	B (B)	--(2)					
SBLTR	0.26 (0.48)	C (B)	0.27 (0.48)	C (B)	0.25 (0.39)	C (B)	0.27 (0.41)	C (C)	0.26 (0.41)	C (C)
<b>Overall</b>	<b>0.43 (0.50)</b>	<b>A (A)</b>	<b>0.44 (0.50)</b>	<b>A (A)</b>	<b>0.48 (0.47)</b>	<b>A (A)</b>	<b>0.54 (0.50)</b>	<b>A (A)</b>	<b>0.52 (0.50)</b>	<b>A (A)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. Sackville Street is proposed to be a one-way, southbound-only travel corridor.

### 8.2.3 Gerrard Street East / Sumach Street

The intersection of Gerrard Street East / Sumach Street operates under signal control with variable cycle lengths in both peak hours due to the implementation of transit signal priority and phase extensions.

**Table 23** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.52 and 0.46 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.64 and 0.56 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no other mitigation measures or improvements are recommended at this intersection, aside from the one-way configuration along Sumach Street.

**TABLE 23 GERRARD STREET EAST / SUMACH STREET TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBLTR	0.20 (0.45)	A (A)	0.20 (0.48)	A (A)	--(2)					
EBLT	Lane group does not currently exist.				0.19 (0.47)	A (A)	0.21 (0.49)	A (A)	0.21 (0.48)	A (A)
WBLTR	0.53 (0.30)	A (A)	0.53 (0.32)	A (A)	--(2)					
WBTR	Lane group does not currently exist.				0.47 (0.29)	A (A)	0.53 (0.30)	A (A)	0.53 (0.30)	A (A)
NBLTR	0.16 (0.25)	D (D)	0.32 (0.28)	D (D)	0.39 (0.37)	D (C)	0.76 (0.58)	D (D)	0.76 (0.57)	D (D)
<b>Overall</b>	<b>0.52 (0.46)</b>	<b>A (A)</b>	<b>0.55 (0.49)</b>	<b>A (A)</b>	<b>0.50 (0.49)</b>	<b>A (A)</b>	<b>0.64 (0.56)</b>	<b>B (A)</b>	<b>0.64 (0.56)</b>	<b>B (A)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. Sumach Street is proposed to be a one-way, northbound-only travel corridor.



## 8.2.4 Gerrard Street East / River Street

The intersection of Gerrard Street East / River Street operates under signal control with variable cycle lengths in both peak hours due to the implementation of transit signal priority and phase extensions. **Table 24** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.79 and 0.96 during the weekday morning and afternoon peak hours, respectively. The eastbound movement operates at near capacity conditions in the weekday afternoon peak hour.

Under future background traffic conditions with the proposed road network, most of the intersection's movements operate under capacity at v/c ratios between 0.14 to 0.89. The eastbound movements will begin to operate over capacity at a v/c ratio of 1.04 during the weekday afternoon peak hours.

With the addition of Site traffic, most of the intersection's movements continue to operate under capacity. The eastbound movements will continue to operate over capacity at overall v/c ratios of 1.04 during the weekday afternoon peak hours. Site-related traffic impact is negligible on the eastbound lane group.

Signal timing optimization is recommended to accommodate the eastbound vehicle movements at the intersection. As post-pandemic travel conditions continue to evolve and adjust to more consistent traffic patterns, the operations at this intersection should continue to be monitored.

**TABLE 24 GERRARD STREET EAST / RIVER STREET TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBLTR	0.49 (0.98)	B (D)	0.47 (1.04)	B (E)	0.46 (1.04)	B (E)	0.54 (1.05)	B (E)	0.86 (1.04)	B (E)
WBLTR	0.86 (0.64)	C (C)	0.82 (0.73)	B (C)	0.82 (0.74)	B (C)	0.85 (0.76)	C (C)	0.84 (0.76)	B (C)
NBL	0.12 (0.27)	B (B)	0.17 (0.32)	B (C)	0.17 (0.32)	B (C)	0.17 (0.44)	B (C)	0.19 (0.50)	B (C)
NBTR	0.42 (0.64)	B (C)	0.61 (0.69)	C (C)	0.61 (0.69)	C (C)	0.61 (0.69)	C (C)	0.61 (0.69)	C (C)
SBL	0.37 (0.81)	B (D)	0.55 (0.89)	C (E)	0.56 (0.89)	C (E)	0.56 (0.89)	C (E)	0.56 (0.89)	C (E)
SBT	0.41 (0.50)	B (C)	0.49 (0.59)	B (C)	0.49 (0.59)	B (C)	0.49 (0.60)	B (C)	0.49 (0.59)	B (C)
SBR	0.17 (0.14)	B (B)	0.18 (0.14)	B (B)	0.18 (0.14)	B (B)	0.19 (0.15)	B (B)	0.19 (0.15)	B (B)
<b>Overall</b>	<b>0.79 (0.96)</b>	<b>B (C)</b>	<b>0.85 (1.02)</b>	<b>B (D)</b>	<b>0.86 (1.02)</b>	<b>B (D)</b>	<b>0.88 (1.03)</b>	<b>B (D)</b>	<b>0.88 (1.02)</b>	<b>B (D)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

## 8.2.5 Parliament Street / Dundas Street East

The intersection of Parliament Street / Dundas Street East operates under signal control with cycle lengths of 76 seconds in both peak hours.

**Table 25** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.35 and 0.44 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.44 and 0.53 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no mitigation measures or improvements are recommended at this intersection.

**TABLE 25 PARLIAMENT STREET / DUNDAS STREET EAST TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBLTR	0.22 (0.39)	A (B)	0.25 (0.45)	A (B)	0.24 (0.45)	A (B)	0.25 (0.48)	A (B)	0.25 (0.48)	A (B)
WBLTR	0.24 (0.22)	B (B)	0.30 (0.26)	B (B)	0.30 (0.25)	B (B)	0.35 (0.28)	B (B)	0.34 (0.28)	B (B)
NBLTR	0.43 (0.53)	C (C)	0.45 (0.58)	C (C)	0.45 (0.58)	C (C)	0.44 (0.62)	C (C)	0.44 (0.61)	C (C)
SBLTR	0.54 (0.42)	C (C)	0.57 (0.48)	C (C)	0.58 (0.50)	C (C)	0.60 (0.52)	C (C)	0.60 (0.52)	C (C)
<b>Overall</b>	<b>0.35 (0.44)</b>	<b>B (B)</b>	<b>0.40 (0.50)</b>	<b>B (B)</b>	<b>0.40 (0.50)</b>	<b>B (B)</b>	<b>0.44 (0.53)</b>	<b>B (B)</b>	<b>0.44 (0.53)</b>	<b>B (B)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

## 8.2.6 Dundas Street East / Sackville Street

The intersection of Dundas Street East / Sackville Street operates under signal control with cycle lengths of 76 seconds in both peak hours.

**Table 26** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.32 and 0.23 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.48 and 0.27 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no mitigation measures or improvements are recommended at this intersection.

**TABLE 26 DUNDAS STREET EAST / SACKVILLE STREET TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTR	0.20 (0.23)	A (A)	0.22 (0.27)	A (A)	0.23 (0.27)	A (A)	0.24 (0.28)	A (A)	0.23 (0.28)	A (A)
WBLT	0.33 (0.24)	A (A)	0.40 (0.27)	A (A)	0.40 (0.26)	A (A)	0.42 (0.27)	A (A)	0.42 (0.27)	A (A)
NBLTR	0.13 (0.14)	C (C)	0.13 (0.14)	C (C)	0.13 (0.14)	C (C)	0.13 (0.14)	C (C)	0.13 (0.14)	C (C)
SBLTR	0.29 (0.23)	C (C)	0.29 (0.23)	C (C)	0.49 (0.26)	C (C)	0.62 (0.26)	C (C)	0.59 (0.22)	C (C)
<b>Overall</b>	<b>0.32 (0.23)</b>	<b>A (A)</b>	<b>0.37 (0.26)</b>	<b>A (A)</b>	<b>0.42 (0.27)</b>	<b>A (A)</b>	<b>0.48 (0.27)</b>	<b>B (A)</b>	<b>0.47 (0.26)</b>	<b>B (A)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

### 8.2.7 Dundas Street East / Sumach Street

The intersection of Dundas Street East / Sumach Street operates under signal control with variable cycle lengths in both peak hours due to the implementation of transit signal priority and phase extensions.

**Table 27** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.35 and 0.43 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.45 and 0.52 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no mitigation measures or improvements are recommended at this intersection.

**TABLE 27 DUNDAS STREET EAST / SUMACH STREET TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBLTR	0.34 (0.41)	A (A)	0.42 (0.50)	A (A)	0.42 (0.51)	A (A)	0.45 (0.52)	A (A)	0.48 (0.51)	A (A)
WBLTR	0.33 (0.26)	A (A)	0.45 (0.33)	A (A)	0.41 (0.34)	A (A)	0.46 (0.44)	A (A)	0.47 (0.41)	A (A)
NBLTR	0.33 (0.43)	C (C)	0.23 (0.44)	C (C)	0.35 (0.45)	D (C)	0.35 (0.45)	D (C)	0.25 (0.45)	C (C)
SBLTR	0.25 (0.12)	C (C)	0.35 (0.17)	C (C)	0.15 (0.09)	C (C)	0.30 (0.12)	D (C)	0.22 (0.12)	C (C)
<b>Overall</b>	<b>0.35 (0.43)</b>	<b>A (B)</b>	<b>0.43 (0.50)</b>	<b>B (B)</b>	<b>0.42 (0.51)</b>	<b>A (B)</b>	<b>0.45 (0.52)</b>	<b>A (B)</b>	<b>0.44 (0.51)</b>	<b>B (B)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

## 8.2.8 Dundas Street East / River Street

The intersection of Dundas Street East / River Street operates under signal control with variable cycle lengths in both peak hours due to the implementation of transit signal priority and phase extensions. **Table 28** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.72 and 0.75 during the weekday morning and afternoon peak hours, respectively.

Under future background traffic conditions with the proposed road network, the intersection continues to operate under capacity at overall v/c ratios of 0.95 and 0.79 during the weekday morning and afternoon peak hours, respectively. However, the northbound shared through-right movement will operate near capacity at a v/c ratio of 0.99 during the weekday morning peak hours.

With the addition of Site traffic, most of the intersection's movements continue to operate under capacity. The northbound shared through-right movement will operate at capacity (up to v/c ratios of 1.01 in the sensitivity condition) during the weekday morning peak hour. Site-related traffic impact is minimal on this movement and in the order of 1% to 2%.

As post-pandemic travel conditions continue to evolve and adjust to more consistent traffic patterns, the operations at this intersection should continue to be monitored prior to any improvements such as signal timing optimization.

**TABLE 28 DUNDAS STREET EAST / RIVER STREET TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTLR	0.56 (0.59)	B (B)	0.80 (0.71)	C (C)	0.82 (0.71)	C (C)	0.93 (0.74)	D (C)	0.95 (0.73)	D (C)
WBTLR	0.58 (0.56)	B (B)	0.86 (0.73)	C (C)	0.86 (0.73)	C (C)	0.91 (0.81)	D (C)	0.92 (0.82)	D (C)
NBL	0.26 (0.06)	C (B)	0.44 (0.22)	C (B)	0.46 (0.22)	C (B)	0.59 (0.34)	C (B)	0.53 (0.30)	C (B)
NBTR	0.71 (0.86)	C (D)	0.99 (0.78)	E (C)	0.99 (0.78)	E (C)	1.00 (0.80)	E (C)	1.01 (0.80)	E (C)
SBL	0.59 (0.40)	C (B)	0.61 (0.61)	C (C)	0.56 (0.61)	C (C)	0.79 (0.64)	D (C)	0.73 (0.68)	C (C)
SBTR	0.86 (0.56)	D (B)	0.78 (0.72)	C (C)	0.80 (0.72)	C (C)	0.86 (0.76)	C (C)	0.85 (0.74)	C (C)
<b>Overall</b>	<b>0.72 (0.75)</b>	<b>C (C)</b>	<b>0.95 (0.79)</b>	<b>D (C)</b>	<b>0.95 (0.79)</b>	<b>D (C)</b>	<b>1.00 (0.84)</b>	<b>D (C)</b>	<b>1.01 (0.85)</b>	<b>D (C)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

## 8.2.9 Dundas Street East / Regent Park Boulevard

The intersection of Dundas Street East / Regent Park Boulevard operates under signal control with cycle lengths of 76 seconds in both peak hours.

**Table 29** summarizes the results of the traffic operations analysis at the intersection.

Under existing traffic conditions, the intersection operates under capacity at overall v/c ratios of 0.28 and 0.34 during the weekday morning and afternoon peak hours, respectively.

Under all future traffic conditions with the proposed road network, the intersection will continue to operate under capacity at overall v/c ratios of 0.37 and 0.41 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no mitigation measures or improvements are recommended at this intersection.

**TABLE 29 DUNDAS STREET EAST / REGENT PARK BOULEVARD TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTR	0.32 (0.38)	A (A)	0.36 (0.46)	A (A)	0.39 (0.46)	A (A)	0.42 (0.47)	A (A)	0.41 (0.46)	A (A)
WBLT	0.28 (0.21)	A (A)	0.34 (0.24)	A (A)	0.33 (0.23)	A (A)	0.33 (0.23)	A (A)	0.33 (0.23)	A (A)
<b>Overall</b>	<b>0.28 (0.34)</b>	<b>A (A)</b>	<b>0.31 (0.40)</b>	<b>A (A)</b>	<b>0.35 (0.41)</b>	<b>A (A)</b>	<b>0.37 (0.41)</b>	<b>A (A)</b>	<b>0.37 (0.41)</b>	<b>A (A)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).



### 8.3 UNSIGNALIZED INTERSECTION ANALYSIS

**Table 30** summarizes the analysis results for unsignalized intersections in the study area.

Under future traffic conditions, most movements operate acceptably in both peak hours at levels-of-service (LOS) E or better.

In the analysis of baseline existing traffic volumes, the shared eastbound movement at River Street / Oak Street indicates delays of up to 86 seconds in the weekday afternoon peak hour. Under future background conditions, these delays are expected to increase to 97 seconds. With the redevelopment of the Site, drivers are expected to experience similar delays as compared to the future background condition.

Signal warrant analysis at the intersections of River Street / Oak Street in addition to the intersection of Parliament Street / Oak Street is further discussed in **Section 8.4**.



**TABLE 30 UNSIGNALIZED INTERSECTION TRAFFIC OPERATIONS**

Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
<b>Parliament Street / Gerrard Street East (North Intersection)</b>										
NBLT	A (A)	0.3 (0.7)	A (A)	0.3 (0.7)	A (A)	0.3 (0.7)	A (A)	0.3 (0.7)	A (A)	0.3 (0.7)
<b>Gerrard Street East / Gifford Street</b>										
EBLT	A (A)	0.4 (0.4)	A (A)	0.4 (0.4)	A (A)	0.4 (0.4)	A (A)	0.5 (0.5)	A (A)	0.5 (0.4)
SBLR	C (C)	18.1 (22.7)	C (C)	18.6 (21.9)	C (C)	19.2 (21.1)	C (C)	19.5 (22.1)	C (C)	19.3 (22.0)
<b>Gerrard Street East / Nasmith Avenue</b>										
EBLT	A (A)	0.4 (0.2)	A (A)	0.4 (0.2)	A (A)	0.5 (0.2)	A (A)	0.5 (0.2)	A (A)	0.5 (0.2)
SBLR	C (C)	19.4 (15.4)	C (C)	20.2 (15.2)	C (B)	20.6 (15.0)	C (C)	21.2 (15.7)	C (C)	20.9 (15.6)
<b>Gerrard Street East / Sword Street</b>										
WBLT	Lane group does not currently exist.						A (A)	0.0 (1.4)	A (A)	0.3 (3.0)
SBLR	C (C)	18.7 (18.5)	C (C)	19.3 (17.1)	C (C)	22.5 (20.0)	C (C)	21.8 (21.8)	C (C)	22.3 (23.7)
<b>Parliament Street / Oak Street<sup>(5)</sup></b>										
WBLR	C (C)	23.8 (17.2)	D (C)	30.7 (23.9)	D (C)	30.8 (24.1)	E (D)	49.6 (30.9)	F (D)	50.1 (31.0)
SBLT	A (A)	1.1 (2.2)	A (A)	1.1 (2.2)	A (A)	1.1 (2.2)	A (A)	0.4 (1.5)	A (A)	0.4 (1.5)
<b>Oak Street / Dreamer's Way</b>										
SBLR	A (A)	9.2 (9.2)	A (A)	9.6 (9.4)	A (A)	9.6 (9.4)	B (A)	10.3 (9.6)	B (A)	10.2 (9.6)
<b>Oak Street / Regent Street</b>										
NBLR	A (A)	9.4 (9.5)	A (A)	9.4 (9.6)	A (A)	9.4 (9.6)	A (A)	9.8 (9.6)	A (A)	9.7 (9.6)



Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
<b>Oak Street / Sackville Street</b>										
EBLTR	A (A)	7.5 (7.7)	A (A)	7.5 (7.8)	...(2)					
EBTR	Lane group does not currently exist.				A (A)	7.7 (7.8)	A (A)	8.1 (8.0)	A (A)	8.0 (8.0)
WBLT <sup>(4)</sup>	A (A)	7.2 (7.6)	A (A)	7.3 (7.6)	A (A)	7.6 (7.4)	A (A)	8.0 (7.6)	A (A)	8.0 (7.6)
SBLTR	A (A)	7.8 (7.7)	A (A)	7.8 (7.8)	A (A)	8.4 (8.1)	B (A)	10.2 (8.7)	A (A)	10.0 (8.6)
<b>Oak Street / Sumach Street</b>										
EBLTR	A (A)	7.5 (8.0)	A (A)	7.6 (8.0)	A (A)	7.8 (8.2)	A (A)	8.1 (8.8)	A (A)	8.0 (8.8)
WBLTR <sup>(6)</sup>	Lane group does not currently exist.								A (A)	7.1 (7.2)
NBLTR	A (A)	7.5 (7.8)	A (A)	7.9 (7.9)	A (A)	7.8 (8.0)	A (A)	8.3 (9.1)	A (A)	8.2 (8.9)
SBLTR	A (A)	7.7 (7.7)	A (A)	7.8 (7.8)	...(3)					
<b>Oak Street / Tubman Avenue</b>										
SBLT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	9.7 (9.7)	B (B)	10.2 (10.1)	B (A)	10.1 (9.8)
<b>River Street / Oak Street<sup>(5)</sup></b>										
EBLTR	C (F)	23.7 (86.0)	D (F)	27.3 (93.5)	D (F)	28.5 (97.1)	D (F)	29.7 (82.6)	D (F)	28.4 (72.7)
WBLTR	C (C)	16.1 (21.6)	C (C)	19.0 (24.3)	C (C)	19.0 (24.3)	C (C)	23.1 (22.9)	C (C)	23.3 (22.4)
NBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBLT	A (A)	1.0 (0.9)	A (A)	1.2 (1.5)	A (A)	1.2 (1.4)	A (A)	1.1 (1.5)	A (A)	1.2 (1.5)
<b>Parliament Street / Cole Street</b>										
SBLT	A (A)	1.5 (2.0)	A (A)	1.4 (1.9)	A (A)	1.4 (1.8)	A (A)	1.4 (1.9)	A (A)	1.4 (1.8)
<b>Dundas Street East / Regent Street</b>										
EBLT	A (A)	0.6 (1.8)	A (A)	0.6 (1.6)	A (A)	0.6 (1.6)	A (A)	0.6 (1.6)	A (A)	0.6 (1.8)
WBLT	A (A)	0.5 (0.4)	A (A)	0.5 (0.4)	A (A)	0.5 (0.4)	A (A)	0.5 (0.4)	A (A)	0.5 (0.4)
NBLTR	C (D)	21.8 (26.1)	D (D)	25.2 (28.9)	D (D)	25.7 (28.9)	D (D)	26.7 (29.6)	D (D)	26.5 (30.2)



Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
SBLTR	C (C)	19.1 (16.1)	C (C)	22.0 (17.0)	C (C)	22.3 (16.9)	C (C)	23.5 (17.2)	C (C)	23.3 (17.4)
Dundas Street East / Tubman Avenue										
EBLTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBLTR	A (A)	0.2 (0.5)	A (A)	0.2 (0.4)	A (A)	0.2 (0.4)	A (A)	0.2 (0.4)	A (A)	0.2 (0.4)
SBLTR	A (B)	0.0 (14.4)	A (C)	0.0 (16.9)	C (C)	22.3 (19.6)	C (C)	20.3 (21.8)	C (C)	23.3 (24.5)
Gerrard Street East / Dreamer's Way										
WBTL	A (A)	0.0 (0.0)	A (A)	0.2 (0.8)	A (A)	0.2 (0.8)	A (A)	0.2 (1.1)	A (A)	0.2 (1.1)
Sackville Street / Site Driveway										
EBLTR	B (B)	10.8 (10.6)	B (B)	10.9 (10.7)	--(2)					
EBTR	Lane group does not currently exist.				B (A)	10.8 (9.5)	B (B)	11.3 (10.1)	B (B)	11.1 (10.1)
WBLTR	B (A)	10.4 (9.4)	B (A)	10.4 (9.5)	--(2)					
WBLT	Lane group does not currently exist.				B (B)	11.8 (10.3)	C (B)	16.2 (13.1)	C (B)	15.9 (13.0)
NBLTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	--(2)					
SBLTR	A (A)	0.8 (0.4)	A (A)	0.8 (0.4)	A (A)	0.8 (0.4)	A (A)	0.8 (1.7)	A (A)	0.9 (1.7)
Sumach Street / Site Driveway										
EBLT	Lane group does not currently exist.						B (B)	10.7 (10.6)	B (B)	10.7 (10.6)
WBLR	A (A)	0.0 (9.0)	A (A)	0.0 (9.1)	--(3)					
WBR	Lane group does not currently exist.				A (A)	0.0 (9.0)	--(3)			
WBTR	Lane group does not currently exist.						A (A)	9.3 (9.4)	A (A)	9.3 (9.4)
NBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	Lane group does not exist.			
NBLTR	Lane group does not currently exist.						A (A)	0.0 (0.7)	A (A)	0.0 (0.7)
SBLT	A (A)	0.6 (0.0)	A (A)	0.6 (0.0)	--(3)					
Dreamer's Way / Site Driveway										



Movement	Existing Road Network				Base Proposed Road Network				Sensitivity Road Network	
	Existing		2032 Future Background		2032 Future Background		2032 Future Total		2032 Future Total	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
WBL	Intersection does not exist.						A (A)	8.8 (9.1)	A (A)	8.8 (9.1)
SBLT							A (A)	1.1 (1.8)	A (A)	1.1 (1.8)
Street 'J' (Tubman Avenue Extension) / Site Driveway <sup>(4)</sup>										
WBL	Intersection does not exist.						A (A)	8.9 (9.3)	A (A)	9.1 (9.5)
SBLT							A (A)	2.6 (5.1)	A (A)	0.8 (3.4)
Gerrard Street East / Street 'G' (New Public Street) <sup>(4)</sup>										
NBR	Intersection does not exist.				A (B)	9.4 (10.1)	A (B)	9.5 (10.3)	A (B)	9.5 (10.3)
Oak Street / New Private Street										
EBLT	Intersection does not exist.				A (A)	0.7 (0.3)	A (A)	1.3 (0.7)	A (A)	1.4 (0.7)
SBLR					A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. Sackville Street is proposed to be a one-way, southbound-only travel corridor.
3. Sumach Street is proposed to be a one-way, northbound-only travel corridor.
4. Street 'G' is proposed to be one-way northbound, while Street 'J' is proposed to be one-way southbound.
5. A pedestrian crossover (PXO) is currently provided south and north of the intersections at River Street / Oak Street and Parliament Street / Oak Street, respectively. However, the Synchro modelling software does not have an option to model a two-way stop control with a PXO. For the purposes of analysis, the intersections are assumed fully two-way stop controlled.
6. In the new proposed road network analysis, the section of Oak Street between Sumach Street to the west and Street 'J' to the east is proposed to operate as a two-way street.

## 8.4 SIGNAL WARRANT REVIEW

The April 2022 TIS provided a signal warrant review at the Parliament Street / Oak Street and River Street / Oak Street intersections. The signals would be located approximately 150m from the Gerrard Street East and Dundas Street East signals to the north and south of these intersections, respectively.

Based on the updated traffic volumes under future conditions, the signal warrants have been revised. They continue to be based on the methodology prescribed in Book 12 of the Ontario Traffic Manual (OTM).

### 8.4.1 Signal Warrant Results

The warrant results under future conditions are summarized in **Table 31**. Detailed warrant calculations are provided in **Appendix H**.



**TABLE 31 SIGNAL WARRANT RESULTS**

Intersection	2032 Future Background	2032 Future Total
Parliament Street / Oak Street	<ul style="list-style-type: none"> <li>Justification 2 is close to satisfied (98% of threshold)</li> </ul>	<ul style="list-style-type: none"> <li>Justification 2 is close to satisfied (99% of threshold)</li> <li>Justification 3 is satisfied</li> </ul>
River Street / Oak Street	<ul style="list-style-type: none"> <li>Justification 1 is close to satisfied (96% of threshold)</li> <li>Justification 2, 3 and 4 are satisfied</li> </ul>	<ul style="list-style-type: none"> <li>Justification 1, 2, 3 and 4 are satisfied</li> </ul>

The signal warrant results are analogous to those previously summarized in the April 2022 TIS.

Under future background traffic conditions, signals are close to warranted at the Parliament Street / Oak Street intersection, but is fully warranted at the River Street / Oak Street intersection.

Under future total traffic conditions, signals are warranted at both intersections.

The implementation of the traffic signals at these two Oak Street intersections will serve to support traffic operations in the area and urban design objectives by providing additional mid-block crossing opportunities and reducing drivers’ reliance on courtesy gaps.

**8.4.2 Analysis of the Recommended Signals**

Capacity analysis at the two proposed signals is summarized in **Table 32**.

Under future total traffic conditions, both intersections are expected to operate under capacity at overall v/c ratios between 0.26 to 0.58 in the peak hours.



**TABLE 32 PROPOSED SIGNALS' TRAFFIC OPERATIONS (YEAR 2032 FUTURE TOTAL)**

Movement	Proposed Road Network	
	V/C	LOS
Parliament Street / Oak Street		
WBLR	0.39 (0.27)	C (C)
NBTR	0.20 (0.29)	B (A)
SBTL	0.23 (0.22)	A (A)
<b>Overall</b>	<b>0.26 (0.29)</b>	<b>B (A)</b>
River Street / Oak Street		
EBTLR	0.25 (0.48)	C (C)
WBTLR	0.21 (0.11)	C (C)
NBTR	0.36 (0.46)	A (A)
SBTL	0.56 (0.61)	A (A)
<b>Overall</b>	<b>0.50 (0.58)</b>	<b>B (B)</b>

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).



## 9.0 SUMMARY

BA Group is retained by Toronto Community Housing Corporation (TCHC) and their development partner Deltera Inc. (Tridel) to provide urban transportation consulting services in relation to a proposed mixed-use development pertaining to the lands generally bounded by Dreamers Way in the west, Gerrard Street East in the north, River Street in the east, and Oak Street to the south (excluding 40 Oak Street) located in the City of Toronto.

The Site is part of a larger multi-phased development project known as *Regent Park Revitalization*; the proposed redevelopment pertains to Phases 4 and 5 which are the final two phases.

A transportation study was originally submitted in April of 2022. This addendum letter provides responses to the received City comments, discusses and analyzes the changes to the development plans, and provides updates to the transportation study where applicable for the purposes of the ZBA submission.

### Updated Development Plan

1. Since the April 2022 TIS, the development program has been revised. In total, the development program includes approximately 3,246 residential dwelling units (1,976 market units and 1,270 affordable units) and 16,452 m<sup>2</sup> non-residential GFA.
2. While key street design objectives remain the same as the original submission, several road network changes listed below are now being proposed:
  - Tubman Avenue Extension: A public street extension of Tubman Avenue is proposed between Gerrard Street East in the north to Oak Street in the south. The street will have a 15.0 right-of-way, including a 4.5m one-way southbound vehicle travel lane, a 2.0m width for lay-by parking, and walkways on both sides.
  - Street 'G': a public street between Gerrard Street East in the north to Oak Street in the south roughly mid-block between Dreamers Way and Sackville Street. . The street will have a 15.0 right-of-way, including a 4.5m one-way southbound vehicle travel lane, a 2.0m width for lay-by parking, and walkways on both sides. The private street has been designed to provide connectivity to loading areas within Buildings 1A, 1B and the Fred Victor Building.
  - A new east-west servicing lane extending from Dreamers Way to the new private north-south street is also proposed between Block 1A and the Fred Victor Building. It has a width of 4.5m and is intended to operate one-way eastbound, to facilitate loading operations associated with the Fred Victor Building.

### Vehicular Parking Considerations

3. The Site is currently subject to Zoning By-law 438-86 and related site-specific zoning by-laws. In discussion with City staff, application of the minimum vehicular parking requirements associated with Zoning By-law 89-2022 would be appropriate for the Site. By-law 89-2022 results in a total Site parking requirement of 54 accessible parking spaces.



4. Vehicular parking is proposed in accordance with the following rates:

Market Housing Blocks:

- Residents: 0.40 spaces per unit
- Residential visitors: 0.06 spaces per unit (to be provided on a shared, non-exclusive basis with parking for non-residential uses)
- Non-residential uses: no dedicated parking

Affordable Housing / Municipal Blocks:

- Residents: 0.40 spaces per unit
- Residential visitors: no parking
- Non-residential uses: no parking

5. Application of the parking supply rates results in a total proposed Site parking supply of 1,417 parking spaces to be split between each block. This supply meets the requirements set forth in By-law 89-2022.

### **Bicycle Parking Considerations**

6. Application of the minimum bicycle parking requirements associated with TGS V4 Tier 1 (which are based upon Zoning By-law 569-2013) results in a total Site requirement of 3,354 bicycle parking spaces.
7. It is proposed to provide a bicycle parking supply that exceeds the requirements; in aggregate across the Site, the plans include 3,890 bicycle parking spaces inclusive of 3,245 long-term residential bicycle parking spaces, 522 short-term residential bicycle parking spaces, and 123 non-residential bicycle parking spaces.
8. As part of the Site's Sustainability Strategy, 15% of the required long-term bicycle parking supply include an energized outlet (120 V) adjacent to the bicycle parking space, this meeting TGS V4.

### **Loading Considerations**

9. Application of the minimum loading requirements associated with Zoning By-law 438-86 results in a total requirement of 9 loading spaces for the entire Site after the application of sharing factors.
10. Application of the minimum loading requirements associated with Zoning By-law 569-2013 results in a total requirement of 10 loading spaces after the application of sharing factors.
11. For the entirety of Phases 4 and 5 in aggregate, a total supply of 11 loading spaces is proposed, inclusive of 5 Type B and 6 Type G loading spaces, modestly exceeding the requirements of both by-laws.

## Trip Generation Update

12. The Site is expected to generate in the order of 425 and 395 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively, representing an increase of 15 to 25 trips in the peak hours compared to the previous submission. The impacts of these additional trips distributed across the entire Site and study area road network are expected to be minimal, and are not expected to alter the conclusions of the vehicular traffic analysis.

## Traffic Operations Analysis

13. All conclusions from the traffic operations analysis are similar to those presented in the April 2022 TIS (and are re-summarized below).
14. Under all future conditions, most of the signalized intersections operate under capacity (i.e. demonstrate volume-to-capacity ratios of less than 1.00).
15. Under future background traffic conditions with the proposed road network, most of the Gerrard Street East / River Street intersection's movements operate under capacity at v/c ratios between 0.14 to 0.89. However, the eastbound movements will begin to operate over capacity at overall v/c ratios of 1.04 during the weekday afternoon peak hours. With the addition of Site traffic, most of the intersection's movements continue to operate under capacity. The eastbound movements will continue to operate over capacity at overall v/c ratios of 1.04 during the weekday afternoon peak hours. Site-related traffic impact is negligible on the eastbound lane group. Signal timing optimization is recommended to accommodate the eastbound vehicle movements at the intersection. As post-pandemic travel conditions continue to evolve and adjust to more consistent traffic patterns, the operations at this intersection should continue to be monitored.
16. Under all future conditions, most movements operate acceptably in both peak hours at levels-of-service (LOS) E or better. In the analysis of baseline existing traffic volumes, the shared eastbound movement at River Street / Oak Street indicates delays of up to 86 seconds in the weekday afternoon peak hour. Under future background conditions, these delays are expected to increase to 97 seconds. With the redevelopment of the Site, drivers are expected to experience similar delays as compared to the future background condition.

## Signal Warrant Review

17. All conclusions from the signal warrant review remain the same as those presented in the April 2022 TIS (and are re-summarized below).

18. Under future background traffic conditions, signals are close to warranted at the Parliament Street / Oak Street intersection, but is fully warranted at the River Street / Oak Street intersection.
19. Under future total traffic conditions, signals are warranted at both intersections.
20. The signals would also serve to provide additional mid-block crossing opportunities and reduce driver reliance on courtesy gaps from Oak Street onto the external area road network.
21. If implemented, both intersections are expected to operate under capacity at overall v/c ratios between 0.26 to 0.58 in the peak hours.

**Based on our review, the proposal is appropriate from a transportation perspective.**



## Appendix A: Reduced-Scale Architectural Site Plans



Site Areas

Gross Site Area (inc. public streets) sqm	64405
Net Site Area (ex. public streets) sqm	56316

	North (Gerrard St)	East (River St)	South (Oak St)	West (Dreamers Way)
Frontage	555.6m	120.3m	490.3m	81.3m
Existing Lot Line Setbacks (minimum)	6.1m	4.8m	0.0m	7.8m
Proposed Lot Line Setbacks (minimum)	3m	3m	3m	3m

	Sackville St	Street G	Sumach St	Street J	Total
Area of Public Streets (sqm)	2169	1806	2307	1807	8089

	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5
Plot Area (sqm)	5525	8264	23489	9417	9621
Grade	91.8	91.8	90.2	90.4	90.4
Maximum Building Heights (m)	86.8	134.1	78.8	120.4	130.8
Below Grade GFA (sqm)	0	0	0	0	0

	Total
Existing Ground Floor Area (sqm)	17191
Proposed Ground Floor Area (sqm)	29780
Lot Coverage Ratio	0.53
Floor Space Index	5.68

Open Space	Area of POPs (sqm)
Area of the central plaza	5520
Area of linear strip	9327
<b>Total</b>	<b>14847</b>

Total GFA Per Tenure

Tenure	Use	Gross Construction Area (sqm)	Gross Floor Area (sqm)*
TCHC	Community Space	3,951	3,714
	Non Residential	5,973	5,616
	Residential	152,344	143,203
	<b>Total</b>	<b>162,268</b>	<b>152,533</b>
MARKET	Non Residential	5,154	4,845
	Residential	170,651	160,413
	<b>Total</b>	<b>175,805</b>	<b>165,258</b>
TPL	Library	2,423	2,277
	<b>Total</b>	<b>2,423</b>	<b>2,277</b>
	<b>Total</b>	<b>340,496</b>	<b>320,068</b>

\*GFA to GFA based on 94% efficiency

Total GFA Per Plot & Building

Plot	Building	Total GFA (sqm)	GFA Breakdown per Use (sqm)			
			Residential	Non Residential*	Community Space	Library
1	A	33,442	30,970	1,078	1,395	
	B	23,188	21,853	1,334		
	C	37,441	37,441			
3	D	19,198	17,605	1,594		
	E	25,240	24,618	623		
	F	4,554		1518	759	2277
	G	405		405		
	H	19,664	18,002	1,662		
	I	22,128	21,523		605	
4	J	23,340	22,046	1,294		
	K	36,850	36,850			
5	L	35,562	34,609	953		
	M	39,054	38,099	955		
	<b>Total</b>	<b>320,064</b>	<b>303,616</b>	<b>10,461</b>	<b>3,714</b>	<b>2,277</b>
		<b>320,064</b>	<b>303,616</b>	<b>16,452</b>		

\*Non residential includes retail and office

Total Unit Count per Tenure

Tenure	Type	Number
TCHC	RGI	633
	Affordable	637
	<b>Total:</b>	<b>1270</b>
Market		1976
	<b>Total</b>	<b>3,246</b>

Residential Unit Mix

Plot	Building	Tenure	Type	Bed Types											Total Units	
				1 Bed	1 Bed Plus*	2 Bed	2 Bed Plus*	3 Bed	3 Bed Plus*	4 Bed	4 Bed Plus*	5 Bed	5 Bed Plus*			
1	A	TCHC	RGI	48	58	71	82	89	103	111	134.5	134	152	202		
			Affordable	16	5	27	9	27	9	17	6	9	3	72		
2	B	Market		146	41	50	15	13	4					269		
				251	70	86	25	23	7					462		
3	C	Market		118	33	40	12	11	3					217		
				165	46	57	16	15	4					303		
			F	Non Residential											0	
			G	Non Residential											0	
			H	TCHC	RGI	13	4	44	15	44	15	7	2	3	1	148
			Affordable	10	3	4	1	4	1						10	
4	I	TCHC	RGI	147	40	51	15	14	4					271		
			Affordable	245	69	85	25	23	7					454		
5	L	TCHC	RGI	5	2	17	6	38	13	8	3	5	1	98		
			Affordable	38	10	67	21	51	16	7	2	1	0	213		
5	M	TCHC	Affordable	48	14	93	30	98	31	16	5	7	0	342		
				1202	337	726	226	485	156	60	20	28	6	3246		
			Percentage	37.0%	10.4%	22.4%	7.0%	14.9%	4.8%	1.8%	0.6%	0.9%	0.2%	100.0%		
			<b>Total</b>	<b>1539</b>	<b>474</b>	<b>952</b>	<b>293</b>	<b>641</b>	<b>80</b>	<b>34</b>						
			Percentage	47.4%	14.2%	29.3%	8.9%	19.7%	2.5%	1.0%						

\*25% of units are assumed plus sized. These units are a mixture of Barrier Free/Accessible Units and Growing Up Guidelines

Residential Amenity Space

Required Area (2 sqm per unit)	Indoor		Outdoor		Total Amenity Space (sqm)
	Provided Area (sqm)	Required Area	Provided Area (sqm)	Required Area	
6492	6492	0	0	0	6492

Bicycle Parking

Plot	Building	Units	Non Residential/Comm unit (sqm)	Required				Provided*			
				Residential		Non Residential		Residential		Non Residential	
				Long Term (0.9 per unit)	Short Term (0.1 per unit)	Long & Short Term (0.5 per 100 sqm)	Total per Underground	Long Term (0.9 per unit)	Short Term (0.1 per unit)	Long & Short Term (0.5 per 100 sqm)	Total per Underground
1	A	274	2473	247	27	12	286	215		56	271
				242	27	7					
				416	46	0	738	725	71		796
3	D	217	1594	195	22	8					
				623	273	30	531	525	123	20	668
				0	4554	0	23				0
				0	405	0	2	25			0
				158	1662	142	16	8			
				185	605	167	19	3	354	429	128
4	J	271	1294	244	27	6					
				454	0	409	45	0	731	591	129
5	L	311	953	280	31	5					
				955	308	34	5	663	760	71	28
				<b>Total</b>	<b>2921</b>	<b>325</b>	<b>82</b>	<b>3245</b>	<b>522</b>	<b>123</b>	
				<b>Total Bicycle Parking</b>	<b>3328</b>			<b>3890</b>			

\*Bicycle parking estimated from illustrative scheme and subject to change at Site Plan

Loading

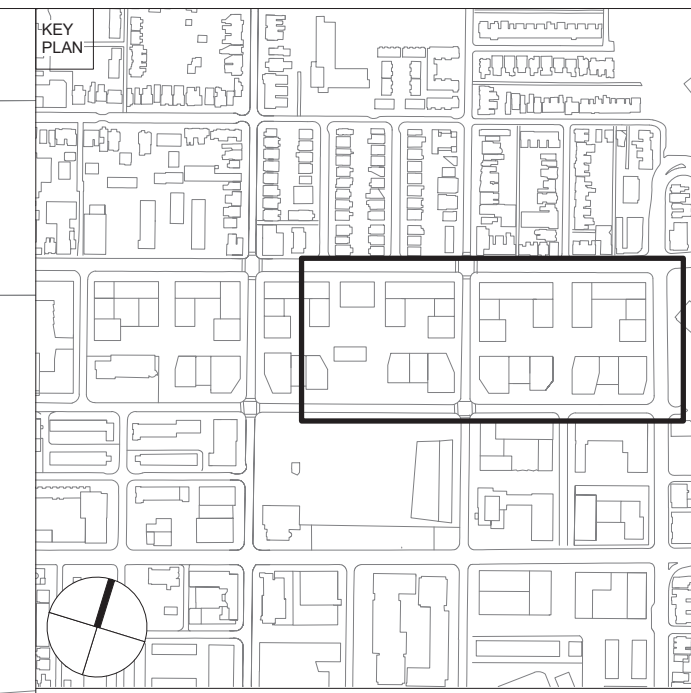
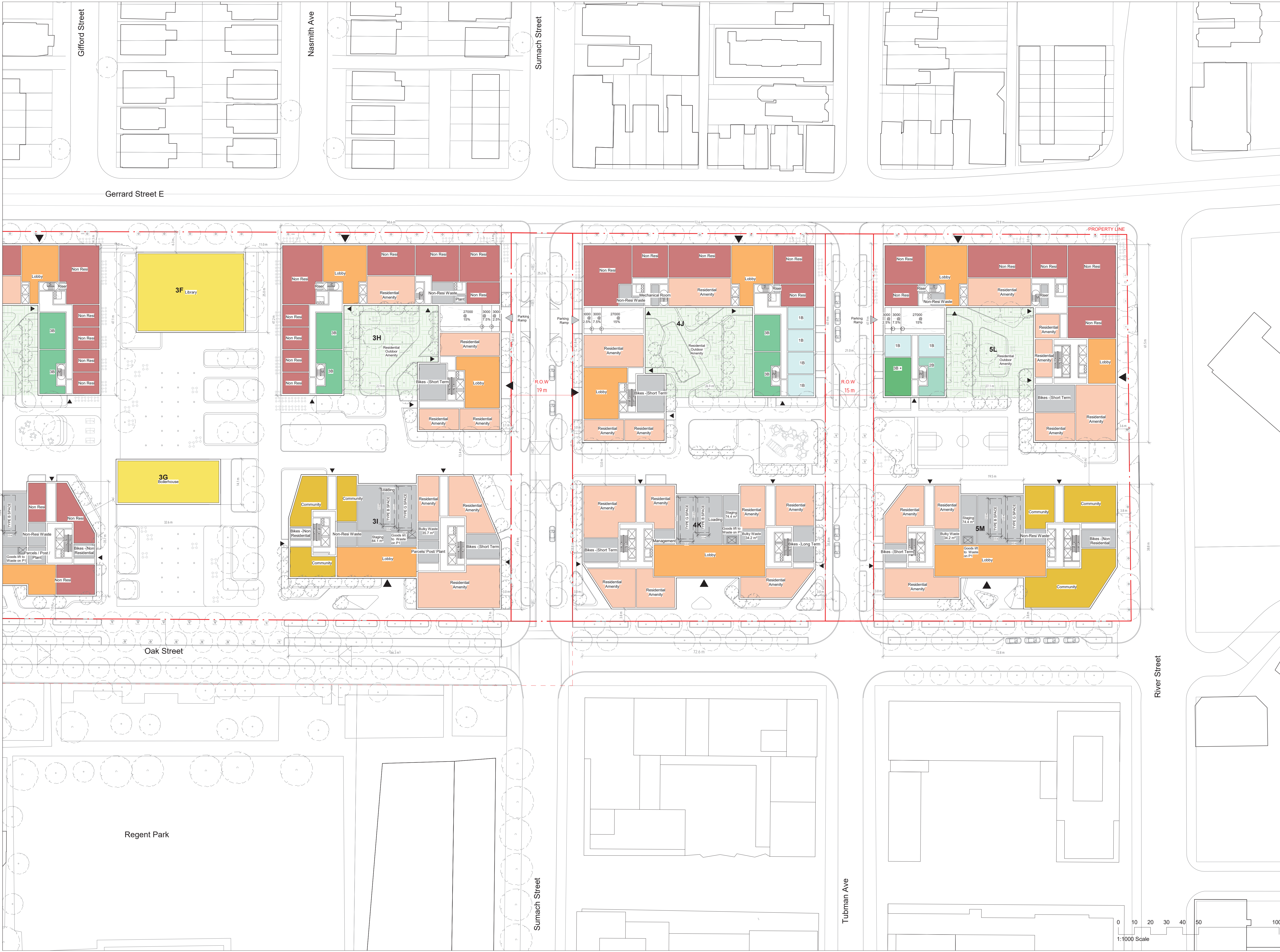
Plot	Building	Provided Loading Space				
		Type A	Type B	Type C	Type G	
1	A	0	1	0	1	
		0	1	0	1	
		0	1	0	1	
3	D	0	1	0	1	
		0	0	0	0	
		0	0	0	0	
		0	0	0	0	
		0	1	0	1	
		0	1	0	1	
4	J	0	1	0	1	
		0	1	0	1	
5	L	0	1	0	1	
		0	1	0	1	
		<b>Total</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>6</b>

Car Parking

Residential Visitor (0.06 per unit - Market only)	Required		Provided	
	Residential Visitor (0.06 per unit)	Residential Visitor (0.06 per unit)	Residential Visitor (0.06 per unit)	Residential Visitor (0.06 per unit)
1298	119	1298	119	
<b>1417</b>		<b>1417</b>		

\*parking estimated from illustrative scheme and subject to change at Site Plan





CLIENT  
**Toronto Community Housing Corporation (TCHC) and 2747199 Ontario Limited (Deltra Inc.)**

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NOTES  
 FOR LANDSCAPE DETAILS REFER TO DRAWINGS BY PFS  
 FOR PARKING AND LOADING OPERATION REFER TO DRAWINGS BY BA GROUP.

Phases 4&5 Property Line  
 City of Toronto Owned Lands Right of Way

- 1B
- 1B+
- 2B
- 2B+
- 3B
- 3B+
- 4B
- 5B
- Amenity
- Ancillary
- Civic
- Community
- Lobby
- Retail
- Residential Outdoor Amenity

# DRAFT

P05	S4	P3	- Issued for ZBA	04/10/23
P04	S3	P3	- Draft for Client Review	03/24/23
P03	S4	P2	- Issued for ZBA	11/29/22
P02	S3	P2	- Draft for Client Review	11/15/22
P01	S4	P1	- Issued for ZBA	04/14/22
P00	S3	P1	- Draft for Client Review	04/01/22

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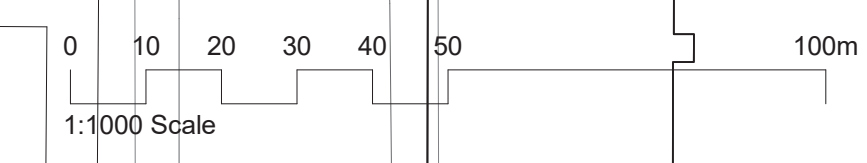


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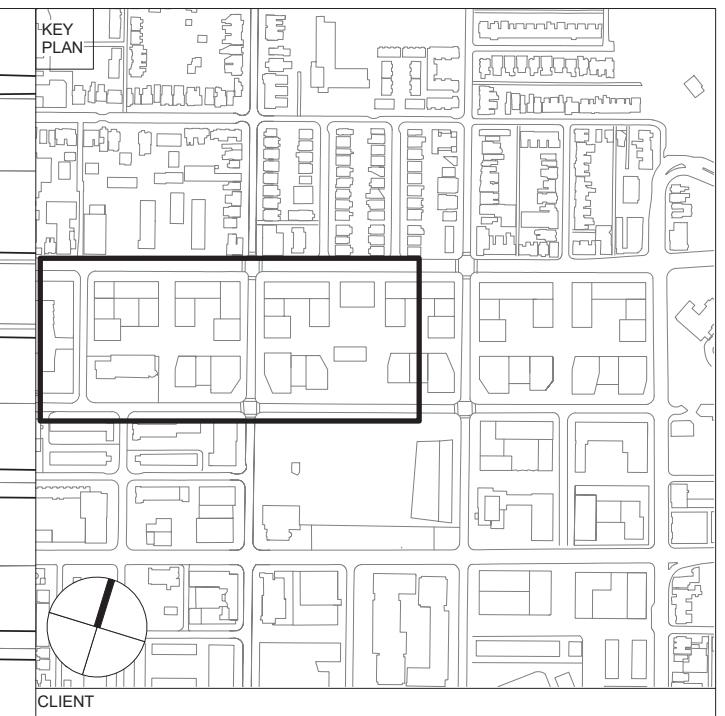
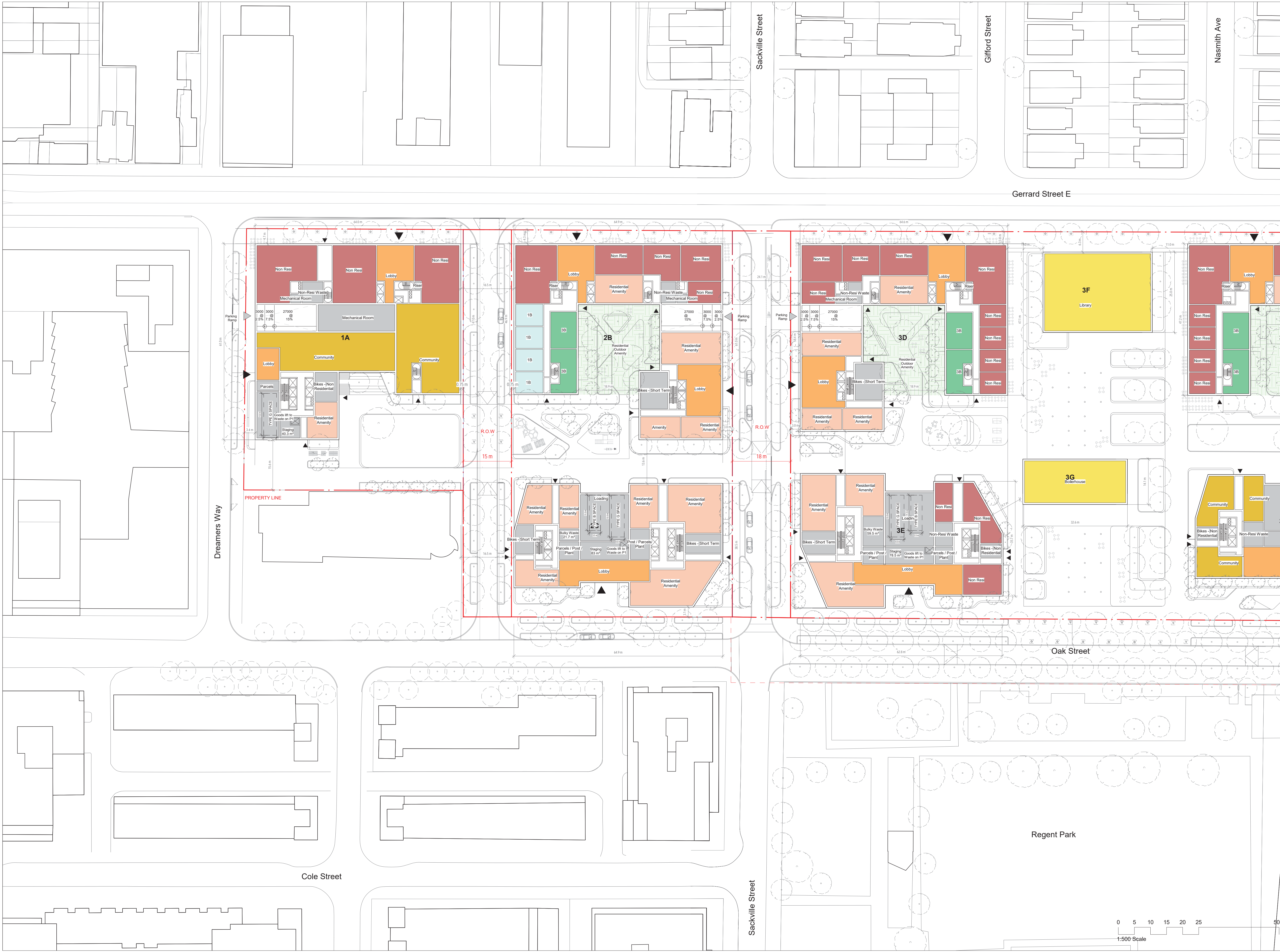
PROJECT  
**Regent Park Phases 4 & 5**

TITLE  
**Ground Floor Plan - East**

DRAWING NUMBER	577 - KCA - EA - 01 - DR - A - 1004	REVISION	P05
STATUS	S4 - Suitable for Stage Approval	STAGE	P3
REVISION DATE	04/10/23	DRAWN BY	H/AJAN
FIRST ISSUED	04/01/22	CHECKED BY	PK/RM
		KCA PROJECT NUMBER	577







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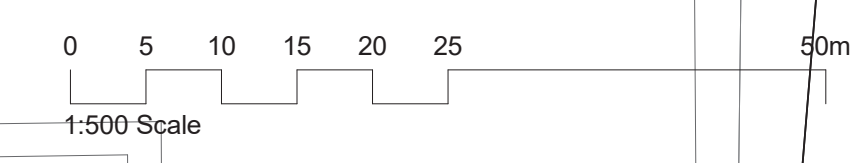


DESIGN  
**Karakusevic Carson Architects**  
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 37 Cremer St  
 Hackney  
 London E2 8HD  
 mail@karakusevic-carson.com | +44(0)207 566 6300

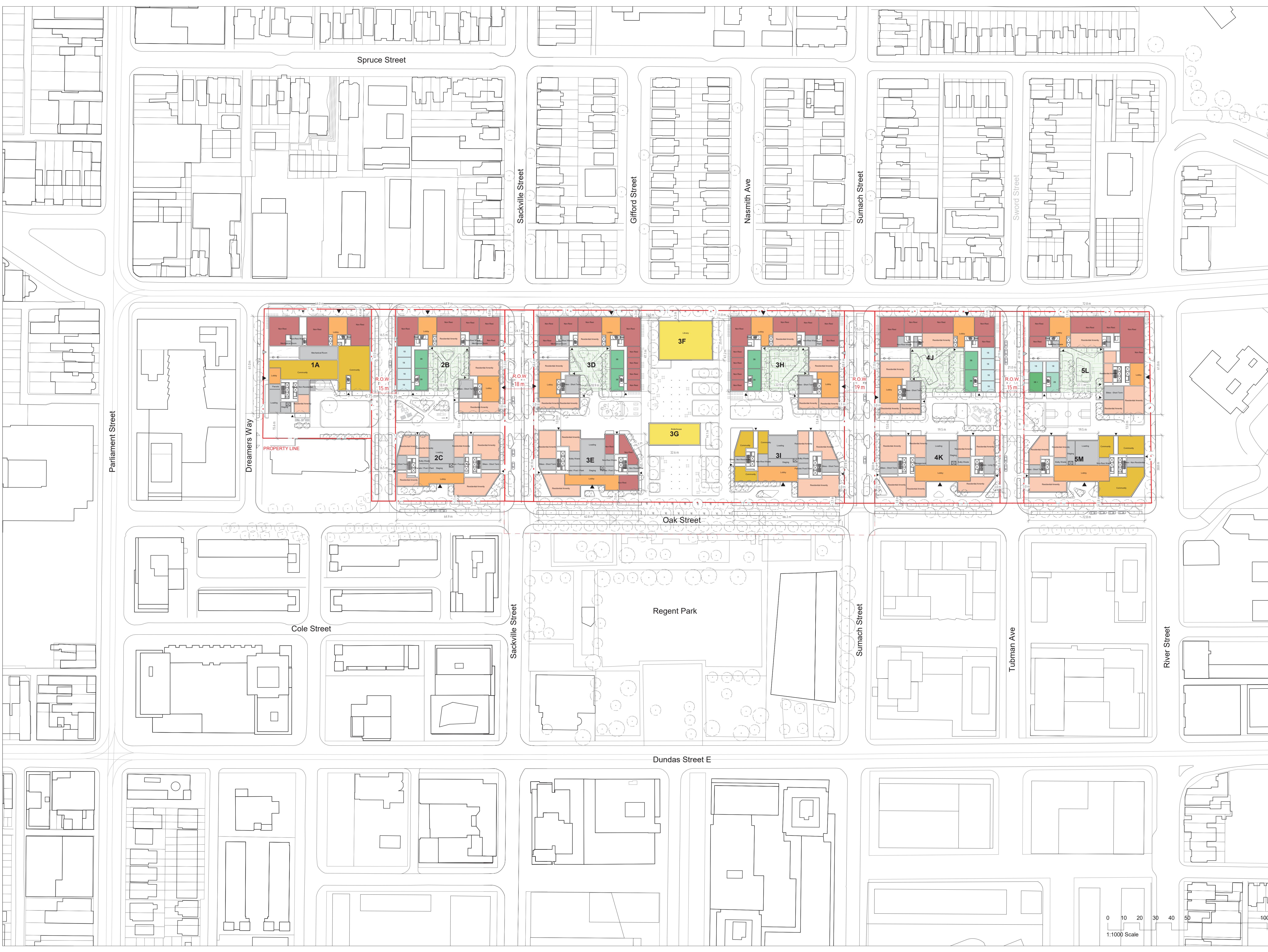
PROJECT  
**Regent Park Phases 4 & 5**

TITLE  
**Ground Floor Plan - West**

DRAWING NUMBER	577 - KCA-WE-01-DR-A - 1004	REVISION	P05
STATUS	S4 - Suitable for Stage Approval	STAGE	P3
REVISION DATE	04/10/23	DRAWN BY	H/A/J
FIRST ISSUED	04/01/22	CHECKED BY	PK/RM
		KCA PROJECT NUMBER	577







**KEY PLAN**

**CLIENT**  
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  - 2B
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  - 3B
  - 3B+
  - 4B
  - 5B
  - Amenity
  - Ancillary
  - Civic
  - Community
  - Lobby
  - Retail
  - Residential Outdoor Amenity

**Bike Parking Schedule - Level G**

Plex	Building	Level	Name	Expires
1	A	Level 0	Bikes - Non Residential	45
1	B	Level 0	Bikes - Short Term	71
2	D	Level 0	Bikes - Short Term	71
2	E	Level 0	Bikes - Short Term	71
2	F	Level 0	Bikes - Short Term	71
2	H	Level 0	Bikes - Non Residential	71
2	I	Level 0	Bikes - Non Residential	19
2	J	Level 0	Bikes - Short Term	58
3	J	Level 0	Bikes - Short Term	71
3	K	Level 0	Bikes - Long Term	58
3	K	Level 0	Bikes - Short Term	71
3	K	Level 0	Bikes - Non Residential	45
3	K	Level 0	Bikes - Short Term	28
3	L	Level 0	Bikes - Short Term	71
Grand total				738

P05	S4	P3	- Issued for ZBA	04/10/23
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 E.R.A. Architects Inc.  
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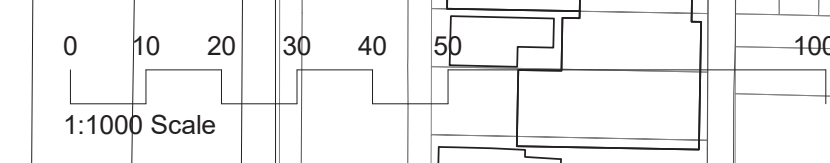


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**PROJECT**  
 Regent Park Phases 4 & 5

**TITLE**  
 Ground Floor Plan

<b>DRAWING NUMBER</b>	577 - KCA-XX-01-DR-A - 1004	<b>REVISION</b>	P05
<b>STATUS</b>	S4 - Suitable for Stage Approval	<b>STAGE</b>	P3
<b>REVISION DATE</b>	04/10/23	<b>DRAWN BY</b>	H/A/J/A
<b>FIRST ISSUED</b>	04/01/22	<b>CHECKED BY</b>	PK/RM
		<b>SCALE</b>	1:1000 @ ARCH D
		<b>KCA PROJECT NUMBER</b>	577



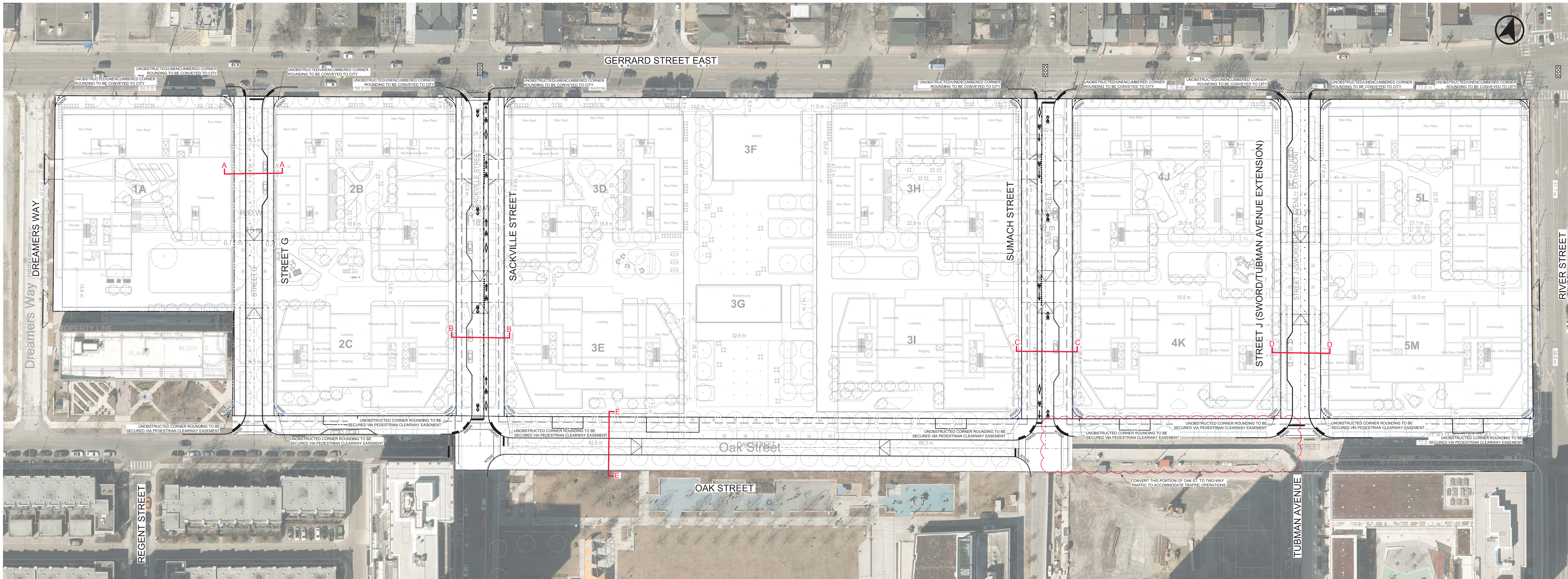
DRAFT



## Appendix B: Functional Road Plan







- GENERAL NOTES**
1. BASE SURVEY PLAN 21-15-128-00 DATED AUGUST 18, 2021, PREPARED BY J.D. BARNES LTD.
  2. ARCHITECTURAL SITE PLAN DATED APRIL 5, 2023 PREPARED BY KARAKUSEVIC CARSON ARCHITECTS.
- GENERAL LEGEND**
- EXISTING SIGNALIZED INTERSECTION
  - PROPOSED CURB
  - PROPOSED CENTRELINE
  - PEDESTRIAN CLEARWAY EASEMENT

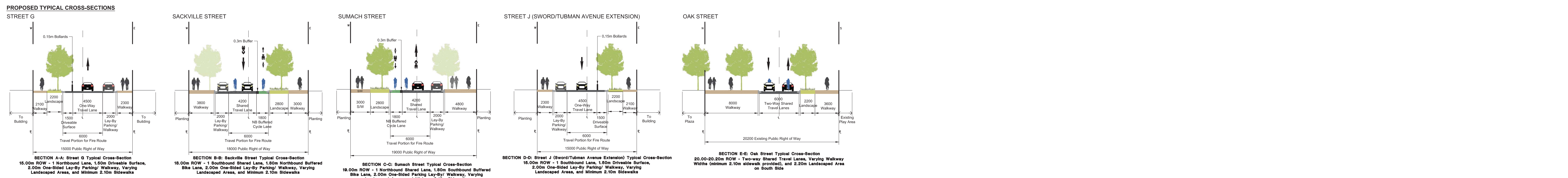
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04	03-17-23	KIC	RE-ISSUED TO CLIENT FOR SUBMISSION
03	11-28-22	KIC	RE-ISSUED TO CLIENT FOR SUBMISSION
02	11-17-22	KIC	RE-ISSUED TO CLIENT FOR SUBMISSION
01	11-10-22	KIC	RE-ISSUED TO CLIENT FOR SUBMISSION
00	11-07-22	KIC	ISSUED TO CLIENT FOR SUBMISSION

**BA Group**

BA Consulting Group Ltd.  
 500 - 45 St. Clair Ave. W.  
 Toronto, ON, M6H 1K8  
 Tel: 416 561 7110  
 www.bagroup.com

**MOVEMENT ENVIRONMENTS**  
 646-6600

**REGENT PARK PHASES 4 & 5**



**FUNCTIONAL ROAD PLAN**

Date: April 13, 2022

Project No.: 7575-46

Scale: 1:500



## **Appendix C: Minimum and Proposed Vehicle Parking Supply Requirements**



Site Specific Minimum Vehicle Parking Requirement

**BLOCKS 1A - TCHC** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
Social	274 units	0.40 spaces per unit	110	100%	100%	100%
Resident Sub-total	274 units	0.40 spaces per unit (blended)	110	110	110	110
Non-Residential						
Social Residential Visitors	274 units	0.00 spaces per unit	0	0	0	0
Community	1395 sm GFA	1 spaces / 175 sm GFA	8	2	8	8
Office	270 sm GFA	1 spaces / 300 sm GFA	1	100%	60%	0%
Retail	809 sm GFA	1 spaces / 100 sm GFA	8	2	8	8
Non-Residential Sub-total			17	20%	100%	100%
<b>TOTAL</b>			<b>127</b>	<b>116</b>	<b>127</b>	<b>126</b>

**BLOCKS 1B & 1C - MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
1-bedroom	508 units	0.41 spaces per unit	208			
2-bedroom	176 units	0.58 spaces per unit	102	100%	100%	100%
3-bedroom	47 units	1.04 spaces per unit	49			
Resident Sub-total	731 units	0.49 spaces per unit (blended)	359	359	359	359
Non-Residential						
Residential Visitors	731 units	0.06 spaces per unit	44	0	15	44
Office	334 sm GFA	1 spaces / 300 sm GFA	1	1	1	0
Retail	1001 sm GFA	1 spaces / 100 sm GFA	10	2	10	10
Non-Residential Sub-total			55	3	26	54
<b>TOTAL</b>			<b>414</b>	<b>362</b>	<b>385</b>	<b>413</b>

**BLOCKS 2D & 2E - MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
1-bedroom	362 units	0.41 spaces per unit	148			
2-bedroom	125 units	0.58 spaces per unit	72	100%	100%	100%
3-bedroom	47 units	1.04 spaces per unit	49			
Resident Sub-total	534 units	0.49 spaces per unit (blended)	269	269	269	269
Non-Residential						
Residential Visitors	520 units	0.06 spaces per unit	31	0	11	31
Office	554 sm GFA	1 spaces / 300 sm GFA	2	2	1	0
Retail	1663 sm GFA	1 spaces / 100 sm GFA	17	3	17	17
Non-Residential Sub-total			50	5	29	48
<b>TOTAL</b>			<b>319</b>	<b>274</b>	<b>298</b>	<b>317</b>

**BLOCKS 2F & 2G - TCHC / MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Non-Residential						
Community	759 sm GFA	1 spaces / 175 sm GFA	4	1	4	4
Library	2277 sm GFA	1 spaces / 175 sm GFA	13	13	13	13
Culture	405 sm GFA	1 spaces / 175 sm GFA	2	2	2	2
Office	380 sm GFA	1 spaces / 300 sm GFA	1	1	1	0
Retail	1139 sm GFA	1 spaces / 100 sm GFA	11	2	11	11
Non-Residential Sub-total			31	19	31	30
<b>TOTAL</b>			<b>31</b>	<b>19</b>	<b>31</b>	<b>30</b>

**BLOCKS 2H & 2I - TCHC** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
Social	343 units	0.40 spaces per unit	137	100%	100%	100%
Resident Sub-total	343 units	0.40 spaces per unit (blended)	137	137	137	137
Non-Residential						
Social Residential Visitors	343 units	0.00 spaces per unit	0	0	0	0
Community	605 sm GFA	1 spaces / 175 sm GFA	3	25%	100%	3
Office	416 sm GFA	1 spaces / 300 sm GFA	1	100%	60%	0%
Retail	1247 sm GFA	1 spaces / 100 sm GFA	12	2	12	12
Non-Residential Sub-total			16	4	16	15
<b>TOTAL</b>			<b>153</b>	<b>141</b>	<b>153</b>	<b>152</b>

**BLOCKS 3I & 3K- MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
1-bedroom	501 units	0.41 spaces per unit	205			
2-bedroom	176 units	0.58 spaces per unit	102	100%	100%	100%
3-bedroom	48 units	1.04 spaces per unit	50			
Resident Sub-total	725 units	0.49 spaces per unit (blended)	357	357	357	357
Non-Residential						
Residential Visitors	725 units	0.06 spaces per unit	44	0	15	44
Community	0 sm GFA	1 spaces / 175 sm GFA	0	0	0	0
Office	324 sm GFA	1 spaces / 300 sm GFA	1	1	1	0
Retail	971 sm GFA	1 spaces / 100 sm GFA	10	2	10	10
Non-Residential Sub-total			55	3	26	54
<b>TOTAL</b>			<b>412</b>	<b>360</b>	<b>383</b>	<b>411</b>

**BLOCKS 4L & 4M - TCHC** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
Social	653 units	0.40 spaces per unit	261	100%	100%	100%
Resident Sub-total	653 units	0.40 spaces per unit (blended)	261	261	261	261
Non-Residential						
Social Residential Visitors	653 units	0.00 spaces per unit	0	0	0	0
Community	955 sm GFA	1 spaces / 175 sm GFA	5	1	5	5
Office	238 sm GFA	1 spaces / 300 sm GFA	1	1	1	0
Retail	715 sm GFA	1 spaces / 100 sm GFA	7	2	7	7
Non-Residential Sub-total			13	3	13	12
<b>TOTAL</b>			<b>274</b>	<b>264</b>	<b>274</b>	<b>273</b>

**SITE TOTAL** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
1-bedroom (Market)	1371 units	0.41 spaces per unit	561 spaces			
2-bedroom (Market)	477 units	0.58 spaces per unit	277 spaces	100%	100%	100%
3-bedroom (Market)	128 units	1.04 spaces per unit	133 spaces			
Social	1270 units	0.40 spaces per unit	508 spaces			
Residential Sub-total	3246 units	0.46 spaces per unit (blended)	1479	1479	1479	1479
Non-Residential						
Market Residential Visitors	1976 units	0.06 spaces per unit	119 spaces	0 spaces	41 spaces	119 spaces
Social Residential Visitors	1270 units	0.00 spaces per unit	0 spaces	0 spaces	0 spaces	0 spaces
Community	3714 sm GFA	1 spaces / 175 sm GFA	20 spaces	5 spaces	20 spaces	20 spaces
Library	2277 sm GFA	1 spaces / 175 sm GFA	13 spaces	13 spaces	13 spaces	13 spaces
Culture	405 sm GFA	1 spaces / 175 sm GFA	2 spaces	2 spaces	2 spaces	2 spaces
Office	2511 sm GFA	1 spaces / 300 sm GFA	8 spaces	8 spaces	7 spaces	0 spaces
Retail	7545 sm GFA	1 spaces / 100 sm GFA	75 spaces	14 spaces	75 spaces	75 spaces
Non-Residential Sub-total			227	42	158	223
<b>TOTAL</b>			<b>1716</b>	<b>1521</b>	<b>1637</b>	<b>1703</b>

**BUILDING 1A**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom		None	0	0.50	0	0.50	0
2-Bedroom		None	0	0.80	0	0.80	0
3-Bedroom		None	0	1.00	0	1.00	0
Affordable Housing <sup>3</sup>	274	None	0	0.50	137	0.20	54
<b>Resident Sub-Total</b>	<b>274</b>	<b>None</b>	<b>0</b>	<b>0.50</b>	<b>137</b>	<b>0.20</b>	<b>54</b>
<b>Non-Residential</b>							
Market Residential Visitor	0	2 plus 0.01 spaces per unit	0	5 plus 0.10 spaces per unit	0	0.10 spaces per unit	0
Affordable Housing Residential Visitor <sup>4</sup>	274	None	0	None	0	None	0
Community	1,395	None	0	0.80 spaces per 100 sqm GFA	11	0.40 spaces per 100 sqm GFA	5
Library		None	0	3.50 spaces per 100 sqm GFA	0	1.00 spaces per 100 sqm GFA	0
Culture		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Office	270	None	0	0.80 spaces per 100 sqm GFA	2	0.40 spaces per 100 sqm GFA	1
Retail	809	None	0	3.50 spaces per 100 sqm GFA	28	1.00 spaces per 100 sqm GFA	8
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>41</b>	<b>--</b>	<b>14</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>178</b>	<b>--</b>	<b>68</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
B1 If the number of effective parking spaces is 13 to 100, a minimum of 1 accessible parking space for every 25 effective parking spaces or part thereof must comply with all regulations for an accessible parking space in Section 200.15.							3
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
2 accessible parking spaces.							3

**BUILDINGS 1B & 1C**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom	508	None	0	0.50	254	0.50	254
2-Bedroom	176	None	0	0.80	140	0.80	140
3-Bedroom	47	None	0	1.00	47	1.00	47
Affordable Housing <sup>3</sup>		None	0	0.50	0	0.20	0
<b>Resident Sub-Total</b>	<b>731</b>	<b>None</b>	<b>0</b>	<b>0.60</b>	<b>441</b>	<b>0.60</b>	<b>441</b>
<b>Non-Residential</b>							
Market Residential Visitor	731	2 plus 0.01 spaces per unit	0	5 plus 0.10 spaces per unit	78	0.10 spaces per unit	73
Affordable Housing Residential Visitor <sup>4</sup>	0	None	0	None	0	None	0
Community		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Library		None	0	3.50 spaces per 100 sqm GFA	0	1.00 spaces per 100 sqm GFA	0
Culture		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Office	334	None	0	0.80 spaces per 100 sqm GFA	2	0.40 spaces per 100 sqm GFA	1
Retail	1001	None	0	3.50 spaces per 100 sqm GFA	35	1.00 spaces per 100 sqm GFA	10
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>116</b>	<b>--</b>	<b>34</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>556</b>	<b>--</b>	<b>522</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
C1 If the number of effective parking spaces is more than 100, a minimum of 5 accessible parking spaces plus 1 accessible parking space for every 50 effective parking spaces or part thereof in excess of 100 parking spaces must comply with all regulations for an accessible parking space in Section 200.15.							14
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
14 accessible parking spaces.							14

**BUILDINGS 2D & 2E**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom	352	None	0	0.50	181	0.50	181
2-Bedroom	125	None	0	0.80	100	0.80	100
3-Bedroom	33	None	0	1.00	33	1.00	33
Affordable Housing <sup>3</sup>		None	0	0.50	0	0.20	0
<b>Resident Sub-Total</b>	<b>520</b>	<b>None</b>	<b>0</b>	<b>0.60</b>	<b>314</b>	<b>0.60</b>	<b>314</b>
<b>Non-Residential</b>							
Market Residential Visitor	520	2 plus 0.01 spaces per unit	7	5 plus 0.10 spaces per unit	57	0.10 spaces per unit	52
Affordable Housing Residential Visitor <sup>4</sup>	0	None	0	None	0	None	0
Community		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Library		None	0	3.50 spaces per 100 sqm GFA	0	1.00 spaces per 100 sqm GFA	0
Culture		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Office	584	None	0	0.80 spaces per 100 sqm GFA	4	0.40 spaces per 100 sqm GFA	2
Retail	1663	None	0	3.50 spaces per 100 sqm GFA	58	1.00 spaces per 100 sqm GFA	16
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>119</b>	<b>--</b>	<b>78</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>433</b>	<b>--</b>	<b>394</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
C1 If the number of effective parking spaces is more than 100, a minimum of 5 accessible parking spaces plus 1 accessible parking space for every 50 effective parking spaces or part thereof in excess of 100 parking spaces must comply with all regulations for an accessible parking space in Section 200.15.							11
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
11 accessible parking spaces.							11

**BUILDINGS 2F & 2G**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom		None	0	0.50	0	0.50	0
2-Bedroom		None	0	0.80	0	0.80	0
3-Bedroom		None	0	1.00	0	1.00	0
Affordable Housing <sup>3</sup>		None	0	0.50	0	0.20	0
<b>Resident Sub-Total</b>	<b>0</b>	<b>None</b>	<b>0</b>	<b>0.50</b>	<b>0</b>	<b>0.20</b>	<b>0</b>
<b>Non-Residential</b>							
Market Residential Visitor	0	2 plus 0.01 spaces per unit	0	5 plus 0.10 spaces per unit	0	0.10 spaces per unit	0
Affordable Housing Residential Visitor <sup>4</sup>	0	None	0	None	0	None	0
Community	759	None	0	0.80 spaces per 100 sqm GFA	6	0.40 spaces per 100 sqm GFA	3
Library	2277	None	0	3.50 spaces per 100 sqm GFA	79	1.00 spaces per 100 sqm GFA	22
Culture	405	None	0	0.80 spaces per 100 sqm GFA	3	0.40 spaces per 100 sqm GFA	1
Office	380	None	0	0.80 spaces per 100 sqm GFA	3	0.40 spaces per 100 sqm GFA	1
Retail	1139	None	0	3.50 spaces per 100 sqm GFA	39	1.00 spaces per 100 sqm GFA	11
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>130</b>	<b>--</b>	<b>38</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>130</b>	<b>--</b>	<b>38</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
B1 If the number of effective parking spaces is 13 to 100, a minimum of 1 accessible parking space for every 25 effective parking spaces or part thereof must comply with all regulations for an accessible parking space in Section 200.15.							2
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
2 accessible parking spaces.							2

**BUILDINGS 2H & 2I**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom		None	0	0.50	0	0.50	0
2-Bedroom		None	0	0.80	0	0.80	0
3-Bedroom		None	0	1.00	0	1.00	0
Affordable Housing <sup>3</sup>	343	None	0	0.50	171	0.20	68
<b>Resident Sub-Total</b>	<b>343</b>	<b>None</b>	<b>0</b>	<b>0.50</b>	<b>171</b>	<b>0.20</b>	<b>68</b>
<b>Non-Residential</b>							
Market Residential Visitor	0	2 plus 0.01 spaces per unit	0	5 plus 0.10 spaces per unit	0	0.10 spaces per unit	0
Affordable Housing Residential Visitor <sup>4</sup>	343	None	0	None	0	None	0
Community	695	None	0	0.80 spaces per 100 sqm GFA	4	0.40 spaces per 100 sqm GFA	2
Library		None	0	3.50 spaces per 100 sqm GFA	0	1.00 spaces per 100 sqm GFA	0
Culture		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Office	416	None	0	0.80 spaces per 100 sqm GFA	3	0.40 spaces per 100 sqm GFA	1
Retail	1247	None	0	3.50 spaces per 100 sqm GFA	43	1.00 spaces per 100 sqm GFA	12
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>50</b>	<b>--</b>	<b>15</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>221</b>	<b>--</b>	<b>83</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
B1 If the number of effective parking spaces is 13 to 100, a minimum of 1 accessible parking space for every 25 effective parking spaces or part thereof must comply with all regulations for an accessible parking space in Section 200.15.							4
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
4 accessible parking spaces.							4

**BUILDINGS 3J & 3K**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom	501	None	0	0.50	250	0.50	250
2-Bedroom	176	None	0	0.80	140	0.80	140
3-Bedroom	46	None	0	1.00	46	1.00	46
Affordable Housing <sup>3</sup>		None	0	0.50	0	0.20	0
<b>Resident Sub-Total</b>	<b>725</b>	<b>None</b>	<b>0</b>	<b>0.60</b>	<b>436</b>	<b>0.60</b>	<b>436</b>
<b>Non-Residential</b>							
Market Residential Visitor	725	2 plus 0.01 spaces per unit	9	5 plus 0.10 spaces per unit	77	0.10 spaces per unit	72
Affordable Housing Residential Visitor <sup>4</sup>	0	None	0	None	0	None	0
Community		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Library		None	0	3.50 spaces per 100 sqm GFA	0	1.00 spaces per 100 sqm GFA	0
Culture		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Office	324	None	0	0.80 spaces per 100 sqm GFA	2	0.40 spaces per 100 sqm GFA	1
Retail	971	None	0	3.50 spaces per 100 sqm GFA	33	1.00 spaces per 100 sqm GFA	9
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>112</b>	<b>--</b>	<b>32</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>548</b>	<b>--</b>	<b>520</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
C1 If the number of effective parking spaces is more than 100, a minimum of 5 accessible parking spaces plus 1 accessible parking space for every 50 effective parking spaces or part thereof in excess of 100 parking spaces must comply with all regulations for an accessible parking space in Section 200.15.							14
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
14 accessible parking spaces.							14

**BUILDINGS 4L & 4M**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor		None	0	0	0	0.30	0
1-Bedroom		None	0	0.50	0	0.50	0
2-Bedroom		None	0	0.80	0	0.80	0
3-Bedroom		None	0	1.00	0	1.00	0
Affordable Housing <sup>3</sup>	653	None	0	0.50	326	0.20	130
<b>Resident Sub-Total</b>	<b>653</b>	<b>None</b>	<b>0</b>	<b>0.60</b>	<b>326</b>	<b>0.20</b>	<b>130</b>
<b>Non-Residential</b>							
Market Residential Visitor	0	2 plus 0.01 spaces per unit	0	5 plus 0.10 spaces per unit	0	0.10 spaces per unit	0
Affordable Housing Residential Visitor <sup>4</sup>	653	None	0	None	0	None	0
Community	965	None	0	0.80 spaces per 100 sqm GFA	7	0.40 spaces per 100 sqm GFA	3
Library		None	0	3.50 spaces per 100 sqm GFA	0	1.00 spaces per 100 sqm GFA	0
Culture		None	0	0.80 spaces per 100 sqm GFA	0	0.40 spaces per 100 sqm GFA	0
Office	238	None	0	0.80 spaces per 100 sqm GFA	1	0.40 spaces per 100 sqm GFA	0
Retail	715	None	0	3.50 spaces per 100 sqm GFA	25	1.00 spaces per 100 sqm GFA	7
<b>Non-Resident Sub-Total</b>	<b>--</b>	<b>0</b>	<b>--</b>	<b>--</b>	<b>32</b>	<b>--</b>	<b>10</b>
<b>TOTAL</b>	<b>--</b>	<b>0</b>	<b>0</b>	<b>--</b>	<b>358</b>	<b>--</b>	<b>140</b>
<b>Accessible Parking Requirement<sup>5</sup></b>							
C1 If the number of effective parking spaces is more than 100, a minimum of 5 accessible parking spaces plus 1 accessible parking space for every 50 effective parking spaces or part thereof in excess of 100 parking spaces must comply with all regulations for an accessible parking space in Section 200.15.							6
<b>Adjusted Minimum Parking Requirement<sup>6</sup></b>							
6 accessible parking spaces.							6

**BUILDINGS 4L & 4M**

Use	Units / GFA	Minimum Parking Required (Ratio)	Minimum	Maximum Parking Provided (Ratio)	Maximum Parking Provided <sup>2</sup> (Spaces)	Effective Parking Required	Effective Parking Required
<b>Residential</b>							
Bachelor	0	None	0	0	0	0.30	0
1-Bedroom	1371	None					

Proposed Vehicle Parking Supply

**BLOCKS 1A - TCHC** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All TCHC Units	274 units	0.40 spaces per unit	110	100%	100%	100%
Resident Sub-total	274 units	0.40 spaces per unit (blended)	110	110	110	110
Non-Residential						
Social Residential Visitors	274 units	0.00 spaces per unit	0	0%	35%	0
Community	1395 sm GFA	0 spaces / 175 sm GFA	0	0	0	0
Office	270 sm GFA	0 spaces / 300 sm GFA	0	100%	60%	0%
Retail	809 sm GFA	0 spaces / 100 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			0	0	0	0
<b>TOTAL</b>			<b>110</b>	<b>110</b>	<b>110</b>	<b>110</b>

**BLOCKS 1B & 1C - MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All Market Units	731 units	0.40 spaces per unit	292	100%	100%	100%
Resident Sub-total	731 units	0.40 spaces per unit (blended)	292	292	292	292
Non-Residential						
Residential Visitors	731 units	0.06 spaces per unit	44	0	15	44
Office	334 sm GFA	0 spaces / 300 sm GFA	0	0	0	0
Retail	1001 sm GFA	0 spaces / 100 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			44	0	15	44
<b>TOTAL</b>			<b>336</b>	<b>292</b>	<b>307</b>	<b>336</b>

**BLOCKS 2D & 2E - MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All Market Units	520 units	0.40 spaces per unit	208	100%	100%	100%
Resident Sub-total	520 units	0.40 spaces per unit (blended)	208	208	208	208
Non-Residential						
Residential Visitors	520 units	0.06 spaces per unit	31	0	11	31
Office	554 sm GFA	0 spaces / 300 sm GFA	0	100%	60%	0%
Retail	1663 sm GFA	0 spaces / 100 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			31	0	11	31
<b>TOTAL</b>			<b>239</b>	<b>208</b>	<b>219</b>	<b>239</b>

**BLOCKS 2F & 2G - TCHC / MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Non-Residential						
Community	759 sm GFA	0 spaces / 175 sm GFA	0	0	0	0
Library	2277 sm GFA	0 spaces / 175 sm GFA	0	25%	100%	100%
Culture	405 sm GFA	0 spaces / 175 sm GFA	0	0	0	0
Office	380 sm GFA	0 spaces / 300 sm GFA	0	100%	100%	100%
Retail	1139 sm GFA	0 spaces / 100 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			0	0	0	0
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**BLOCKS 2H & 2I - TCHC** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All TCHC Units	343 units	0.40 spaces per unit	137	100%	100%	100%
Resident Sub-total	343 units	0.40 spaces per unit (blended)	137	137	137	137
Non-Residential						
Social Residential Visitors	343 units	0.00 spaces per unit	0	0	0	0
Community	605 sm GFA	0 spaces / 175 sm GFA	0	20%	100%	100%
Office	416 sm GFA	0 spaces / 300 sm GFA	0	100%	60%	0%
Retail	1247 sm GFA	0 spaces / 100 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			0	0	0	0
<b>TOTAL</b>			<b>137</b>	<b>137</b>	<b>137</b>	<b>137</b>

**BLOCKS 3I & 3K - MARKET** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All Market Units	725 units	0.40 spaces per unit	290	100%	100%	100%
Resident Sub-total	725 units	0.40 spaces per unit (blended)	290	290	290	290
Non-Residential						
Residential Visitors	725 units	0.06 spaces per unit	44	0	15	44
Community	0 sm GFA	0 spaces / 175 sm GFA	0	0	0	0
Office	324 sm GFA	0 spaces / 175 sm GFA	0	100%	60%	0%
Retail	971 sm GFA	0 spaces / 175 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			44	0	15	44
<b>TOTAL</b>			<b>334</b>	<b>290</b>	<b>305</b>	<b>334</b>

**BLOCKS 4L & 4M - TCHC** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All TCHC Units	653 units	0.40 spaces per unit	261	100%	100%	100%
Resident Sub-total	653 units	0.40 spaces per unit (blended)	261	261	261	261
Non-Residential						
Social Residential Visitors	653 units	0.00 spaces per unit	0	0	0	0
Community	955 sm GFA	0 spaces / 175 sm GFA	0	20%	100%	100%
Office	238 sm GFA	0 spaces / 300 sm GFA	0	100%	60%	0%
Retail	715 sm GFA	0 spaces / 100 sm GFA	0	20%	100%	100%
Non-Residential Sub-total			0	0	0	0
<b>TOTAL</b>			<b>261</b>	<b>261</b>	<b>261</b>	<b>261</b>

**SITE TOTAL** \* bylaw uses normal rounding

Use / Type	# of Units / GFA	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)	Shared Parking		
				AM	PM	Evening
Residential						
All Market Units	1976 units	0.40 spaces per unit	790 spaces	100%	100%	100%
All TCHC Units	1270 units	0.40 spaces per unit	508 spaces			
Residential Sub-total	3246 units	0.40 spaces per unit (blended)	1298	1298	1298	1298
Non-Residential						
Market Residential Visitors	1976 units	0.06 spaces per unit	119 spaces	0 spaces	41 spaces	119 spaces
Social Residential Visitors	1270 units	0.00 spaces per unit	0 spaces	0 spaces	0 spaces	0 spaces
Community	3714 sm GFA	0 spaces / 175 sm GFA	0 spaces	25%	100%	100%
Library	2277 sm GFA	0 spaces / 175 sm GFA	0 spaces	100%	100%	100%
Culture	405 sm GFA	0 spaces / 175 sm GFA	0 spaces	100%	100%	100%
Office	2511 sm GFA	0 spaces / 300 sm GFA	0 spaces	100%	60%	0%
Retail	7545 sm GFA	0 spaces / 100 sm GFA	0 spaces	20%	100%	100%
Non-Residential Sub-total			119	0	41	119
<b>TOTAL</b>			<b>1417</b>	<b>1298</b>	<b>1339</b>	<b>1417</b>

## **Appendix D: Minimum and Proposed Bicycle Parking Supply Requirements**



Minimum Bicycle Parking Requirement TGS v3 Zone 1

BLOCKS 1A - TCHC

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	274 units	Occupant	0.90 spaces per unit	247 spaces
		Visitor	0.10 spaces per unit	28 spaces
		Total	1.00 spaces per unit	275 spaces
Community	1395 sm GFA	Total	--	0 spaces
Office	270 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	1 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	4 spaces
		Total		5 spaces
Retail	809 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	2 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	8 spaces
		Total		6 spaces
<b>TOTAL</b>				<b>288 spaces</b>

BLOCKS 1B & 1C - MARKET

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	731 units	Occupant	0.90 spaces per unit	658 spaces
		Visitor	0.10 spaces per unit	74 spaces
		Total	1.00 spaces per unit	732 spaces
Community	0 sm GFA	Total	--	0 spaces
Office	334 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	1 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	4 spaces
		Total		5 spaces
Retail	1001 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	3 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	7 spaces
		Total		10 spaces
<b>TOTAL</b>				<b>747 spaces</b>

BLOCKS 2D & 2E - MARKET

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	520 units	Occupant	0.90 spaces per unit	468 spaces
		Visitor	0.10 spaces per unit	52 spaces
		Total	1.00 spaces per unit	520 spaces
Community	0 sm GFA	Total	--	0 spaces
Office	554 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	2 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	5 spaces
		Total		7 spaces
Retail	1663 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	4 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	8 spaces
		Total		12 spaces
<b>TOTAL</b>				<b>539 spaces</b>

BLOCKS 2F & 2G - TCHC / MARKET

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Community	759 sm GFA	Total	--	0 spaces
Library	2277 sm GFA	Total	--	0 spaces
Culture	405 sm GFA	Total	--	0 spaces
Office	380 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	1 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	4 spaces
		Total		5 spaces
Retail	1139 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	3 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	7 spaces
		Total		10 spaces
<b>TOTAL</b>				<b>15 spaces</b>

BLOCKS 2H & 2I - TCHC

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	343 units	Occupant	0.90 spaces per unit	309 spaces
		Visitor	0.10 spaces per unit	35 spaces
		Total	1.00 spaces per unit	344 spaces
Community	605 sm GFA	Total	--	0 spaces
Office	416 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	1 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	4 spaces
		Total		5 spaces
Retail	1247 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	3 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	7 spaces
		Total		10 spaces
<b>TOTAL</b>				<b>359 spaces</b>

BLOCKS 3J & 3K - MARKET

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	725 units	Occupant	0.90 spaces per unit	653 spaces
		Visitor	0.10 spaces per unit	73 spaces
		Total	1.00 spaces per unit	726 spaces
Community	0 sm GFA	Total	--	0 spaces
Office	324 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	1 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	4 spaces
		Total		5 spaces
Retail	971 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	2 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	6 spaces
		Total		8 spaces
<b>TOTAL</b>				<b>739 spaces</b>

BLOCKS 4L & 4M - TCHC

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	653 units	Occupant	0.90 spaces per unit	588 spaces
		Visitor	0.10 spaces per unit	66 spaces
		Total	1.00 spaces per unit	654 spaces
Community	955 sm GFA	Total	--	0 spaces
Office	238 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	1 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	4 spaces
		Total		5 spaces
Retail	715 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	2 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	6 spaces
		Total		8 spaces
<b>TOTAL</b>				<b>667 spaces</b>

SITE TOTAL

Use / Type	# of Units / GFA	Type	Minimum Parking Requirement (Ratio)	Minimum Parking Requirement (Spaces)
Residential	3246 units	Occupant	0.90 spaces per unit	2923 spaces
		Visitor	0.10 spaces per unit	328 spaces
		Total	1.00 spaces per unit	3251 spaces
Community	3714 sm GFA	Total	--	0 spaces
Library	2277 sm GFA	Total	--	0 spaces
Culture	405 sm GFA	Total	--	0 spaces
Office	2511 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	8 spaces
		Short-Term	3 plus 0.2 spaces / 100 sqm GFA	29 spaces
		Total		37 spaces
Retail	7545 sm GFA	Long-Term	0.2 spaces / 100 sqm GFA	19 spaces
		Short-Term	3 plus 0.3 spaces / 100 sqm GFA	47 spaces
		Total		66 spaces
Long-Term Subtotal				2950 spaces
Short-Term Subtotal				404 spaces
<b>TOTAL</b>				<b>3354 spaces</b>



## Appendix E: Vehicle Manoeuvring Diagrams



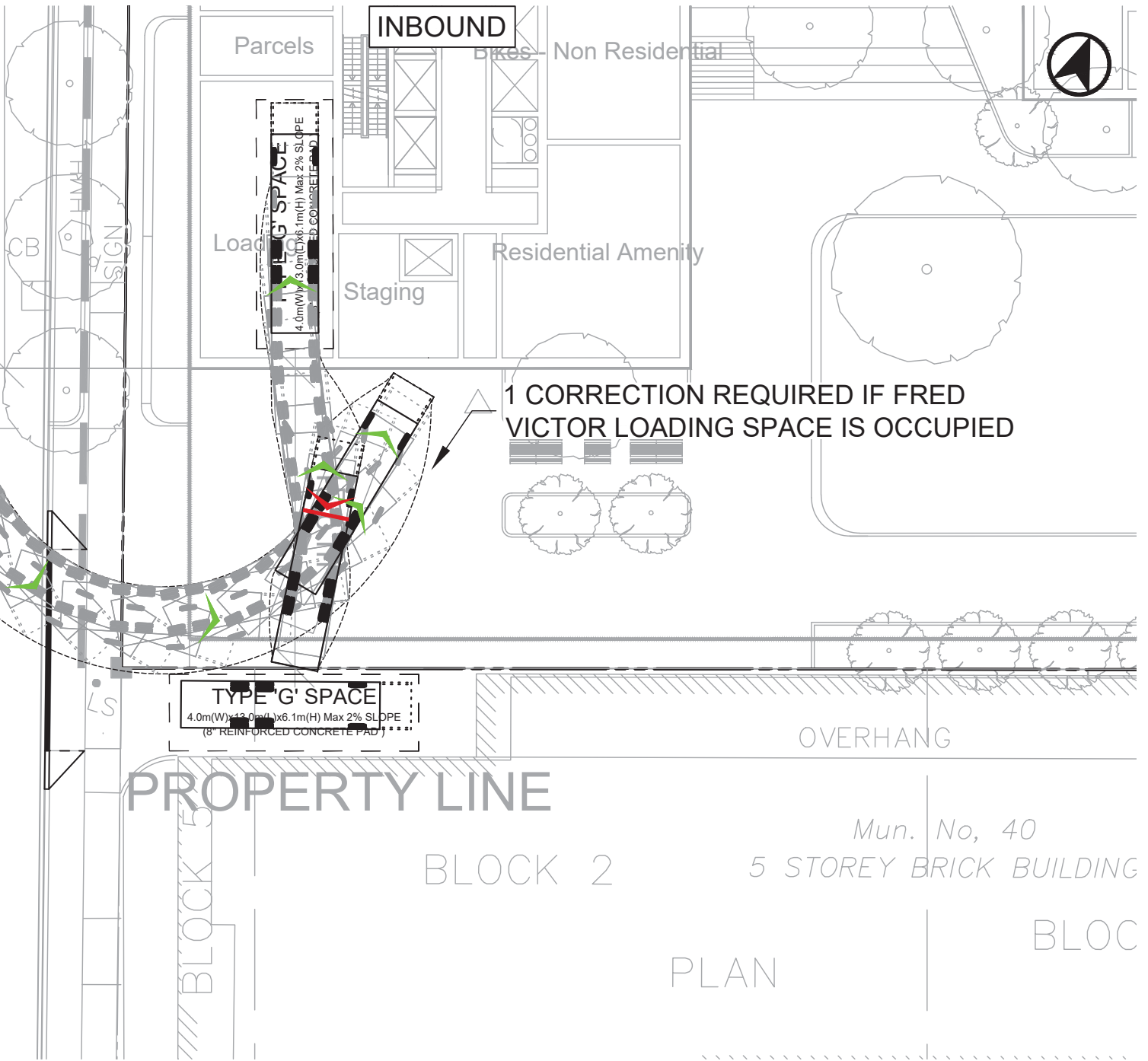
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DREAMERS WAY

BACK OF CURB

EDGE OF ASPHALT ROAD

DREAMERS WAY

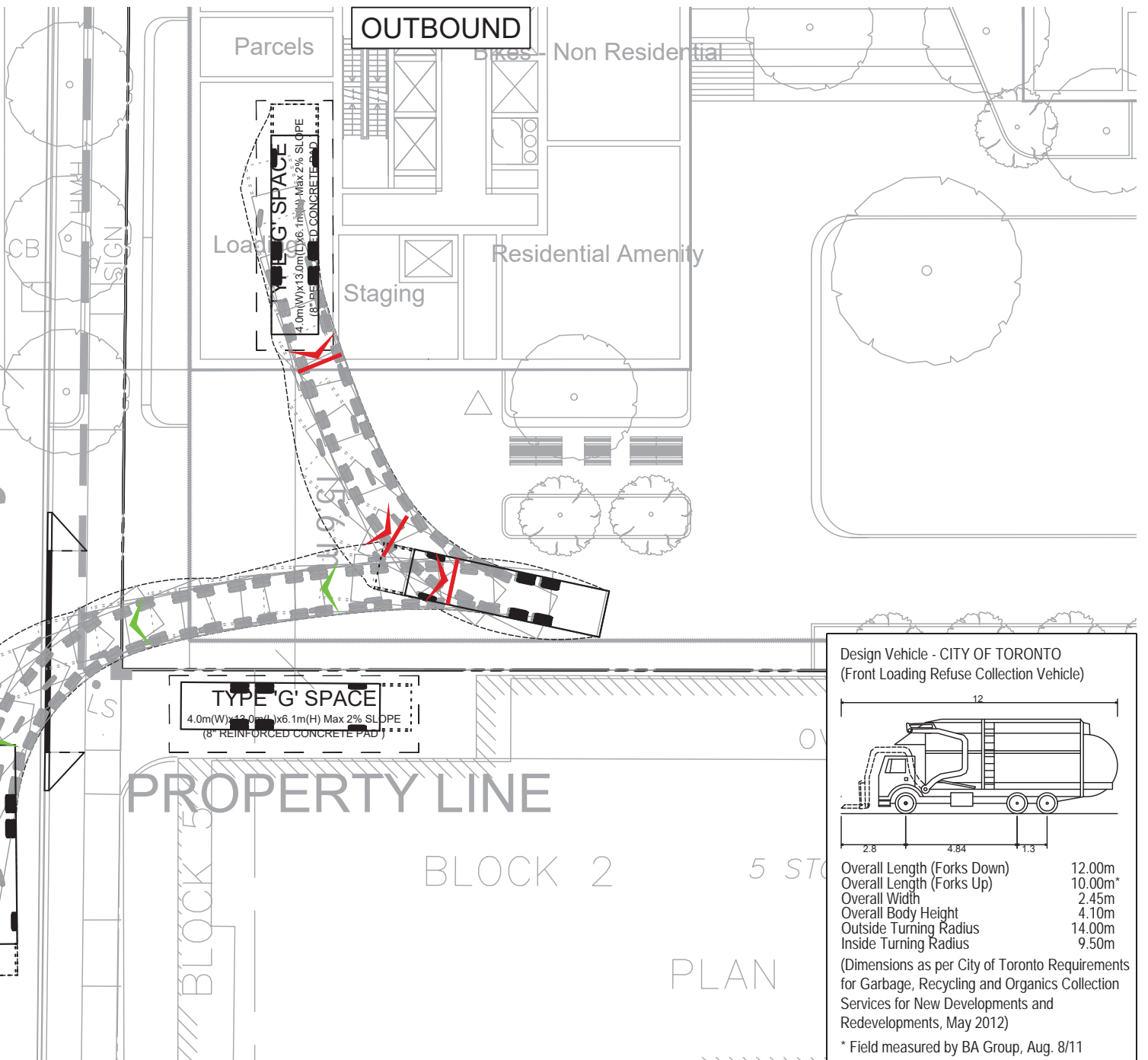


DREAMERS WAY

BACK OF CURB

EDGE OF ASPHALT ROAD

DREAMERS WAY



**Design Vehicle - CITY OF TORONTO**  
(Front Loading Refuse Collection Vehicle)

Overall Length (Forks Down)	12.00m
Overall Length (Forks Up)	10.00m*
Overall Width	2.45m
Overall Body Height	4.10m
Outside Turning Radius	14.00m
Inside Turning Radius	9.50m

(Dimensions as per City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments, May 2012)  
\* Field measured by BA Group, Aug. 8/11



**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Building 1A  
City of Toronto Front Loading Garbage Truck  
Fred Victor Loading Space Occupied

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

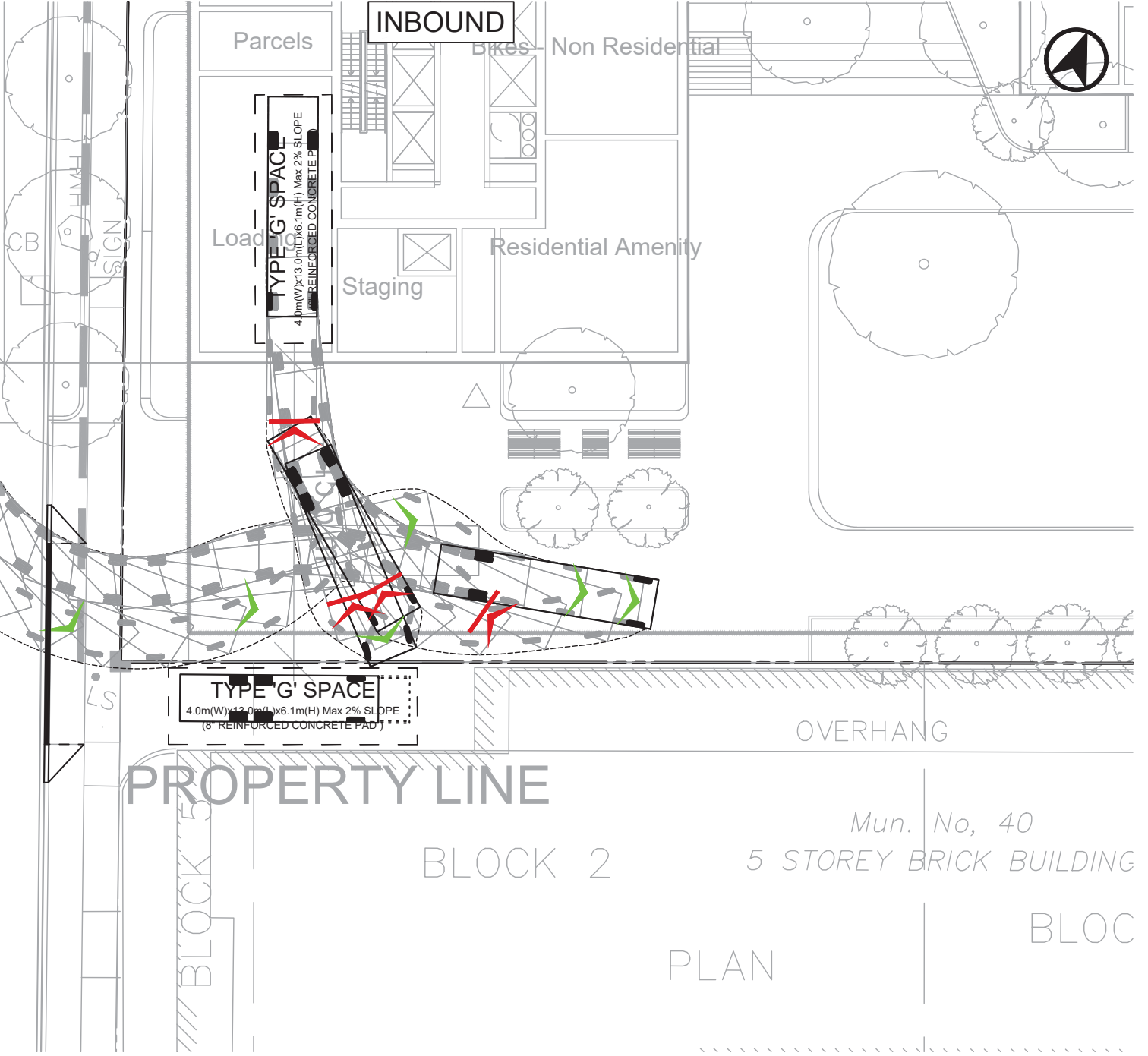
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# DREAMERS WAY

BACK OF CURB

EDGE OF ASPHALT ROAD

# Dreamers Way



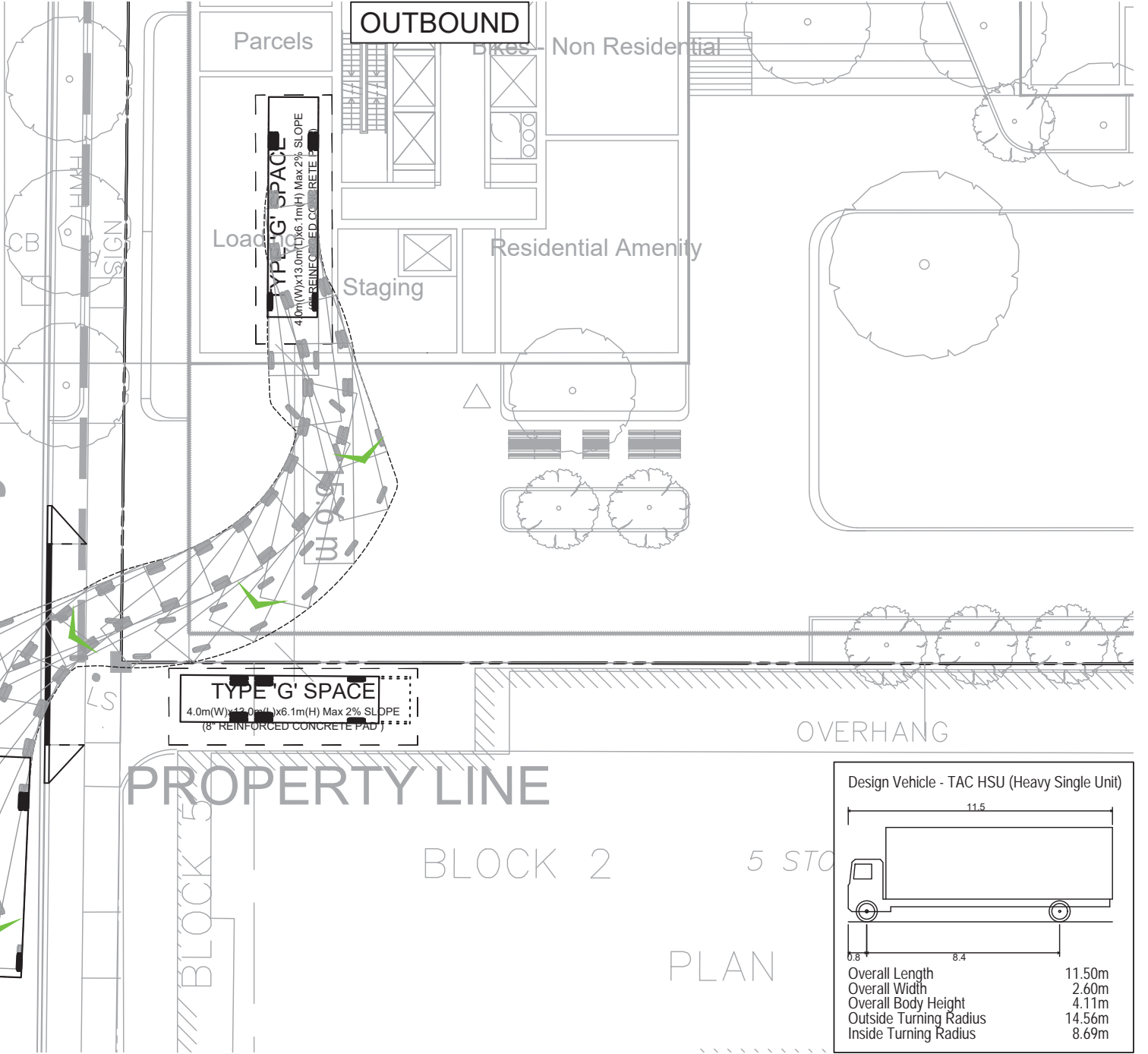
PLAN

# DREAMERS WAY

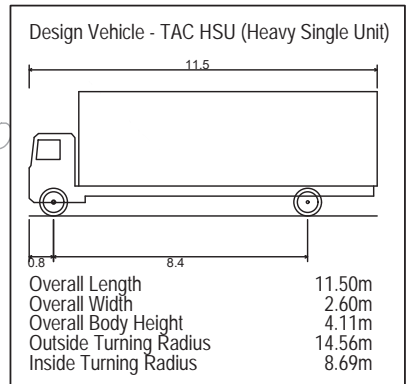
BACK OF CURB

EDGE OF ASPHALT ROAD

# Dreamers Way

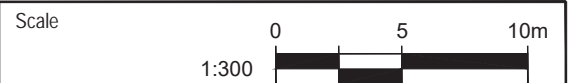


PLAN



**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Building 1A  
 TAC Heavy Single Unit (HSU) Truck  
 Fred Victor Loading Space Occupied

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023



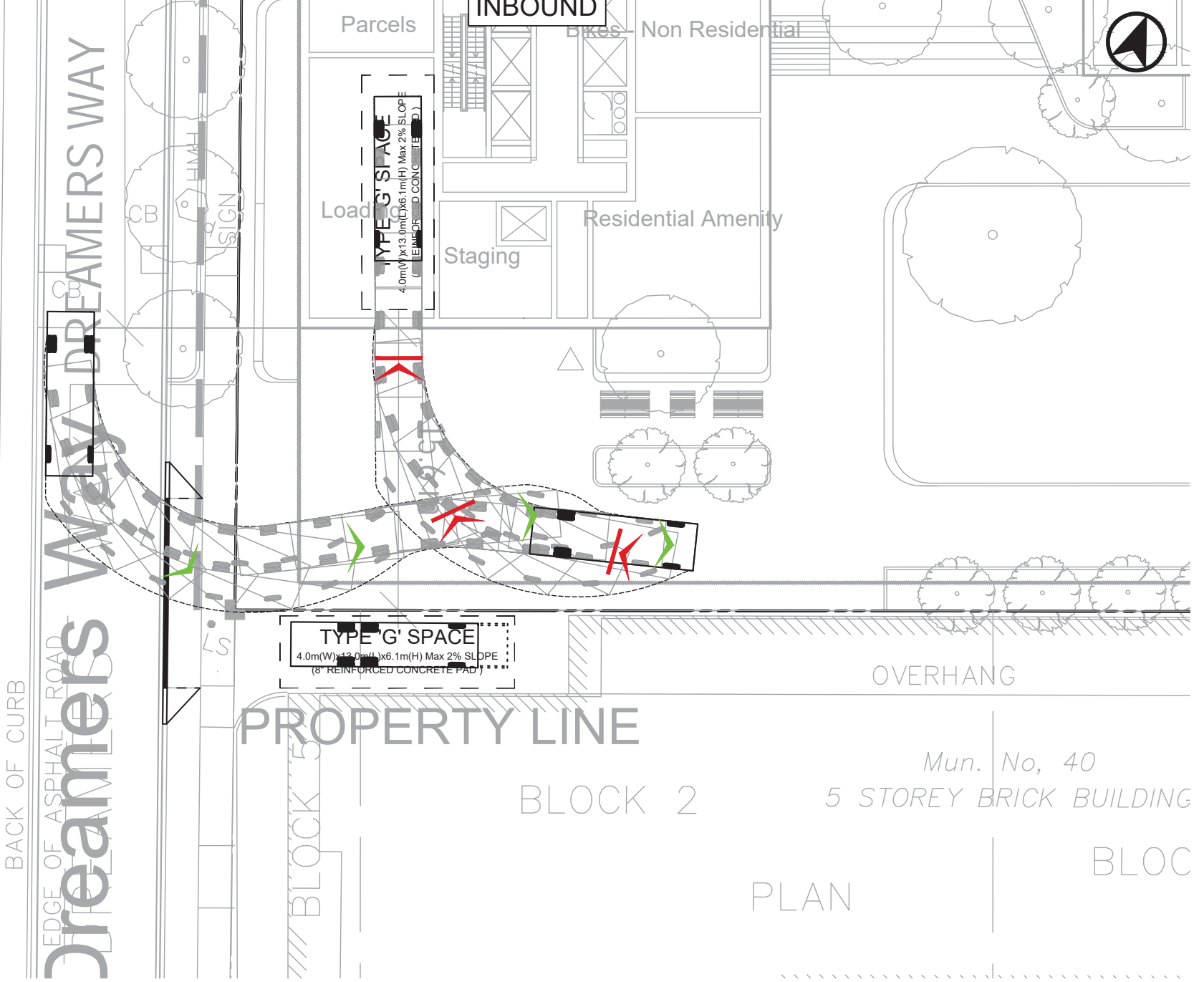
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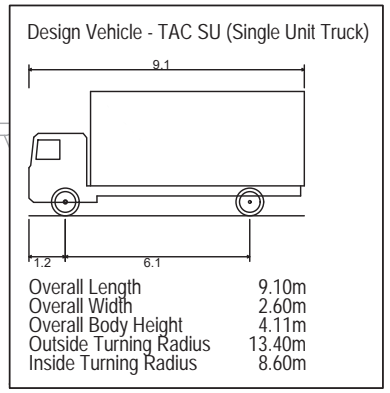
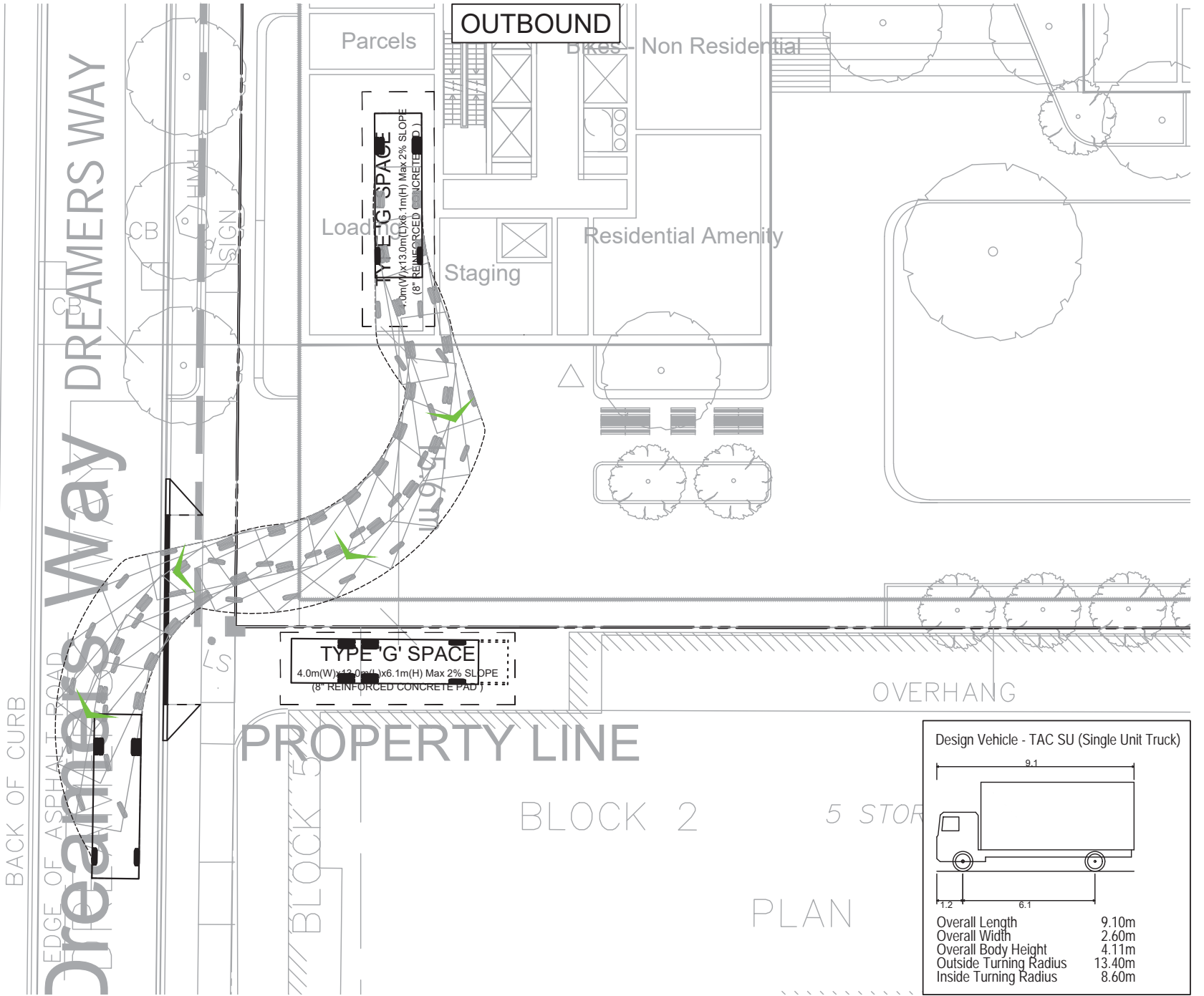
# DREAMERS WAY

# DREAMERS WAY



# DREAMERS WAY

# DREAMERS WAY



**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Building 1A  
 TAC Single Unit (SU) Truck  
 Fred Victor Loading Space Occupied

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-01C**

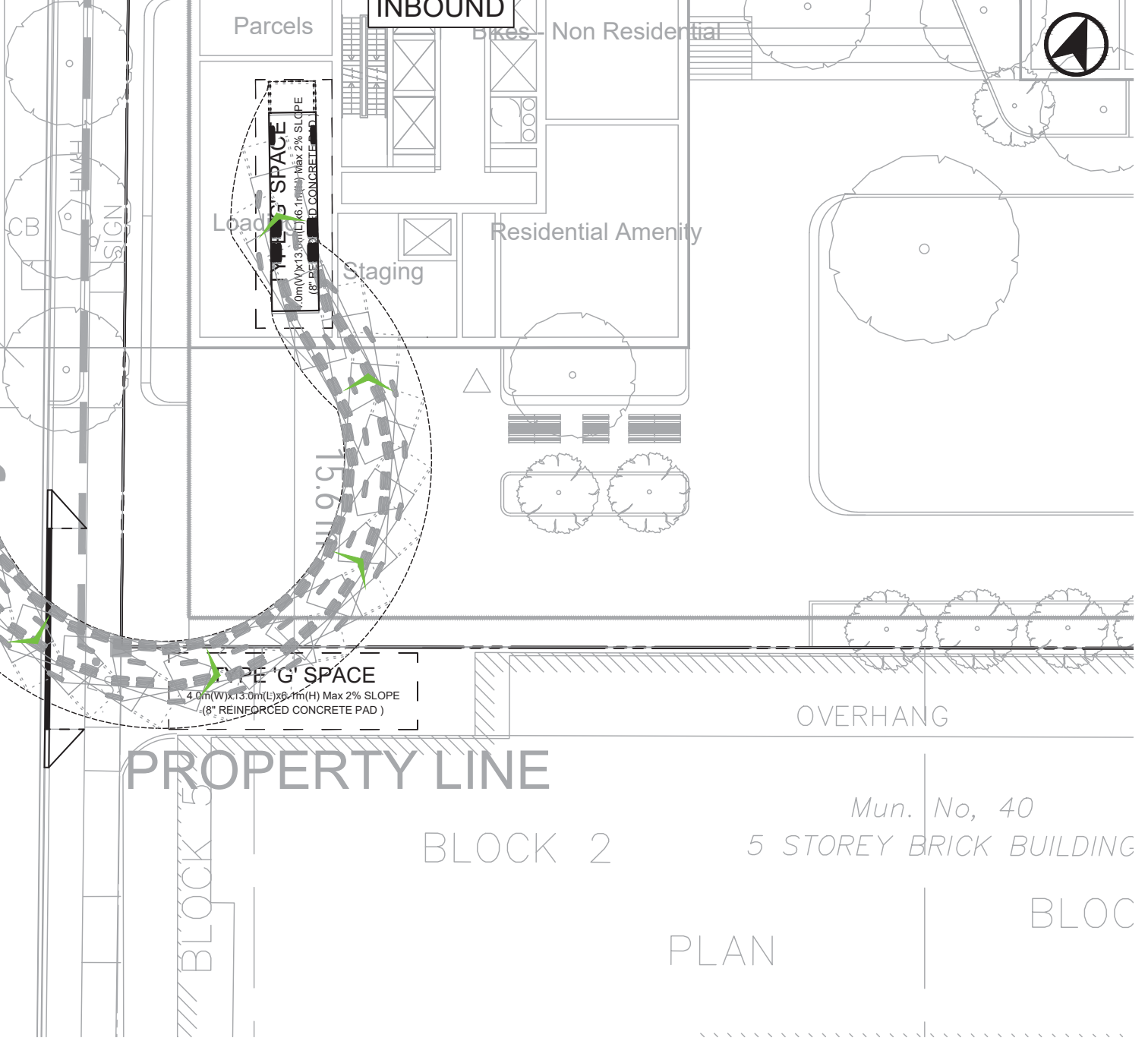




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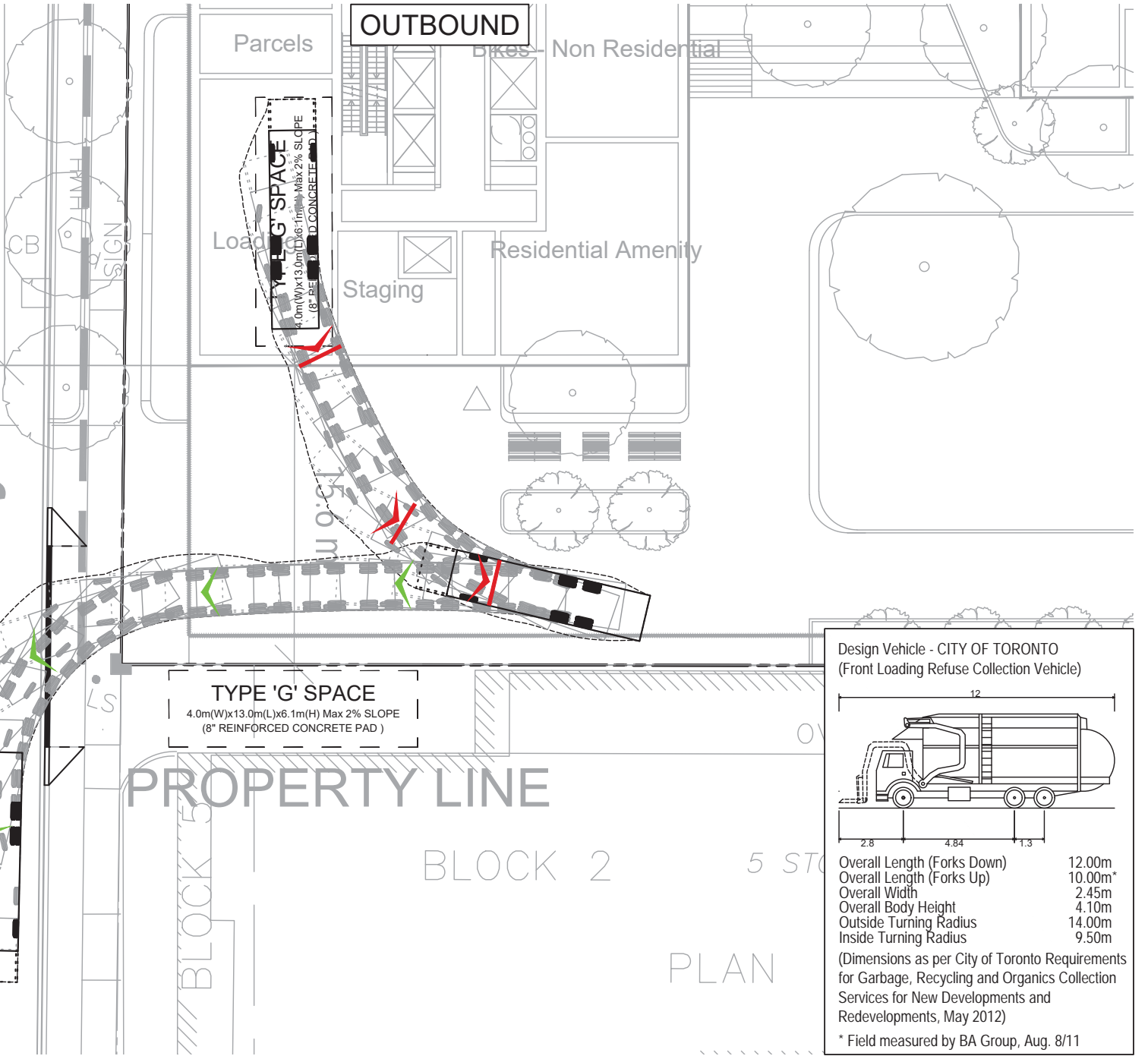
# DREAMERS WAY

# DREAMERS WAY



# DREAMERS WAY

# DREAMERS WAY



**Design Vehicle - CITY OF TORONTO**  
(Front Loading Refuse Collection Vehicle)

Overall Length (Forks Down)	12.00m
Overall Length (Forks Up)	10.00m*
Overall Width	2.45m
Overall Body Height	4.10m
Outside Turning Radius	14.00m
Inside Turning Radius	9.50m

(Dimensions as per City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments, May 2012)  
\* Field measured by BA Group, Aug. 8/11



**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Building 1A  
City of Toronto Front Loading Garbage Truck  
Fred Victor Loading Space Unoccupied

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

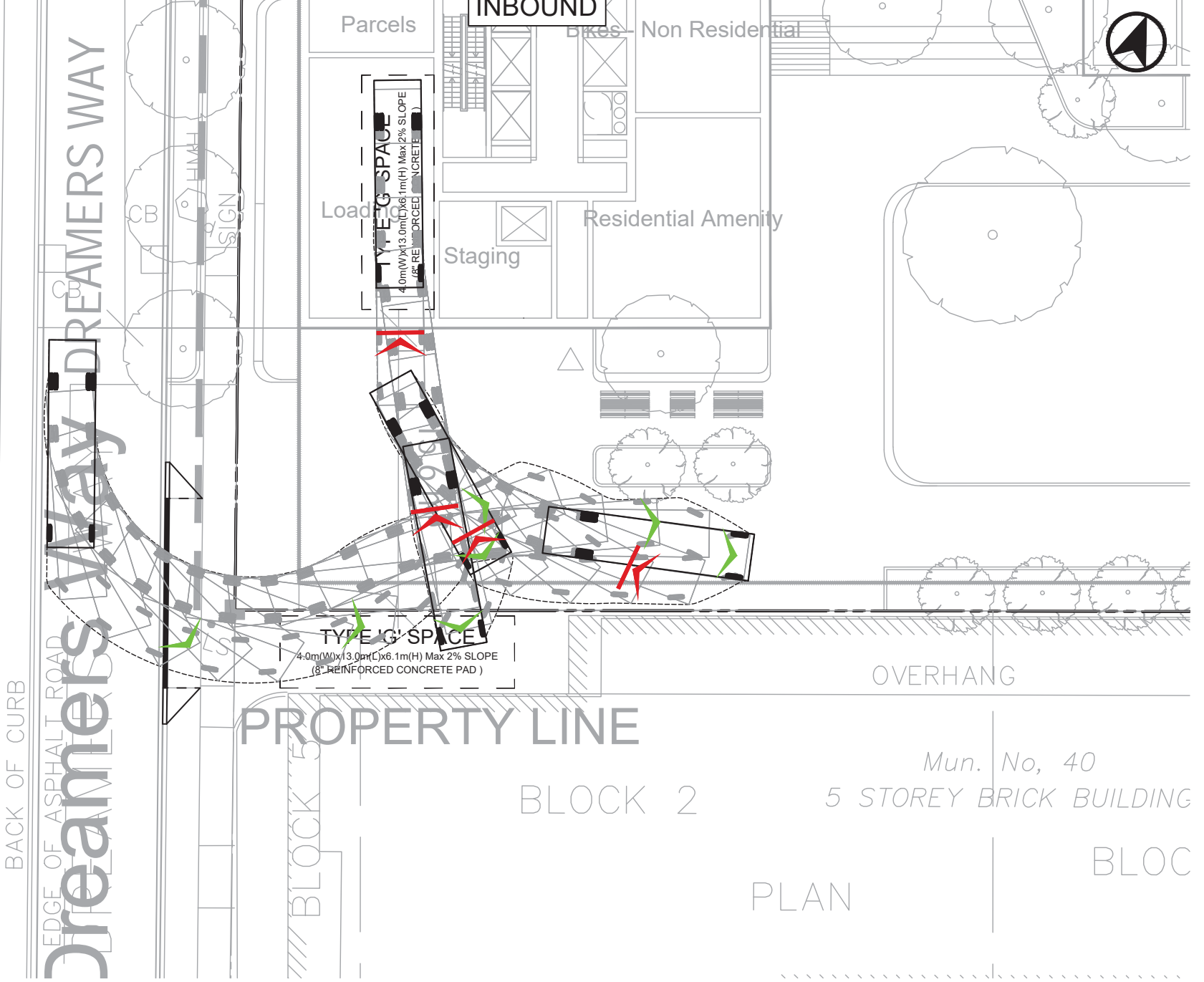
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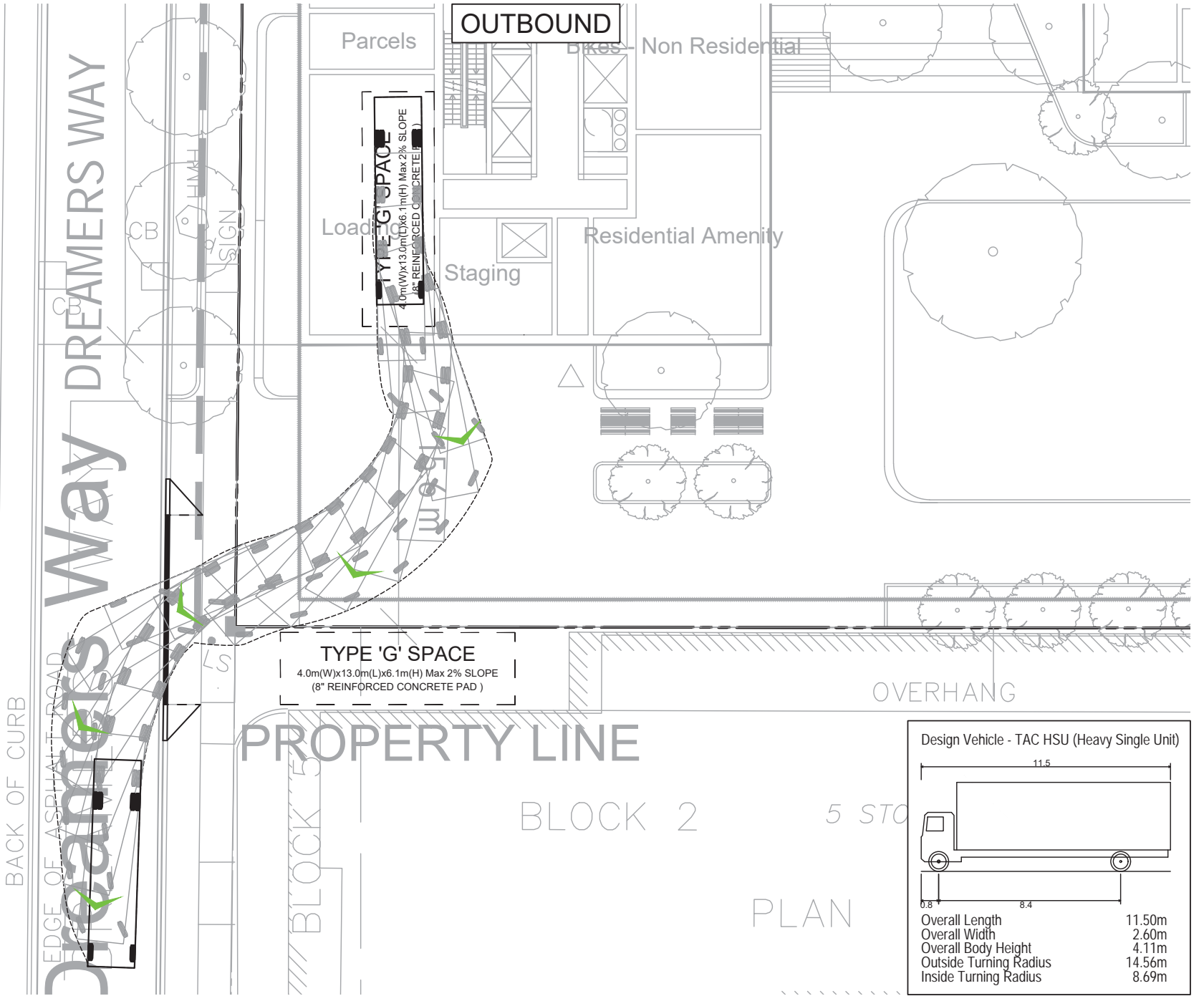
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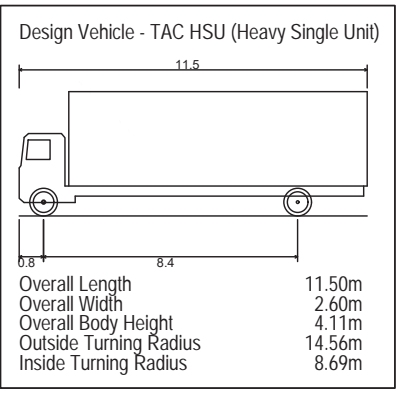
PLAN

# DREAMERS WAY

# DREAMERS WAY



PLAN



**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Building 1A  
 TAC Heavy Single Unit (HSU) Truck  
 Fred Victor Loading Space Unoccupied

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-02B**



Date Plotted: April 10, 2023 File name: \\baip03\cad\7575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

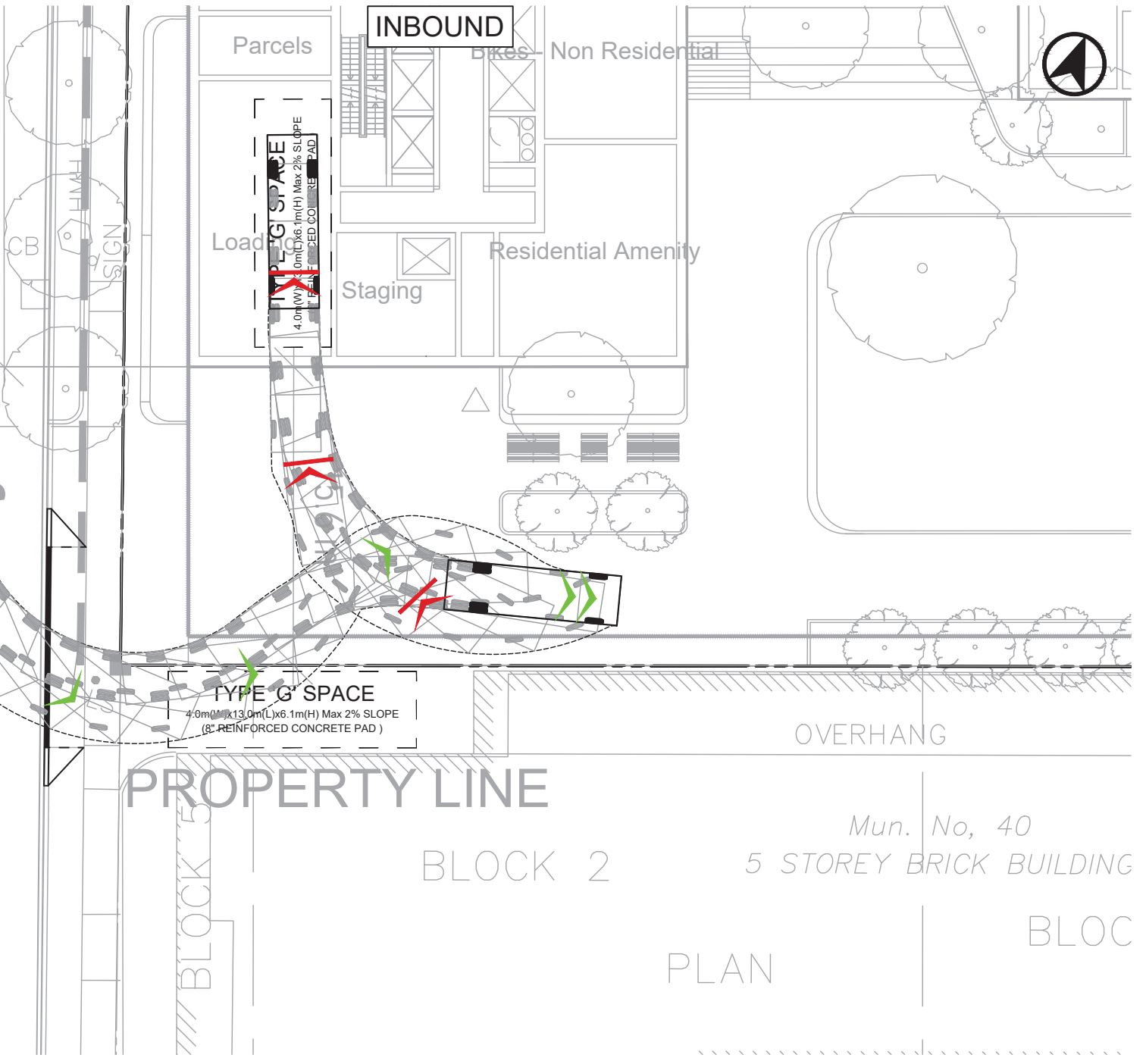
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BACK OF CURB

EDGE OF ASPHALT ROAD

# Dreamers Way

# DREAMERS WAY



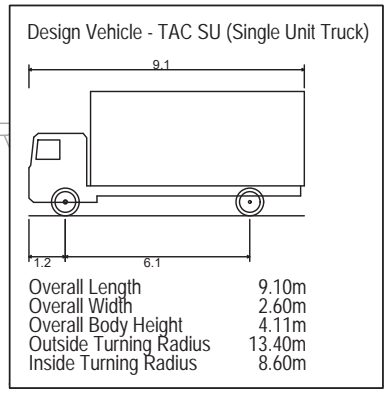
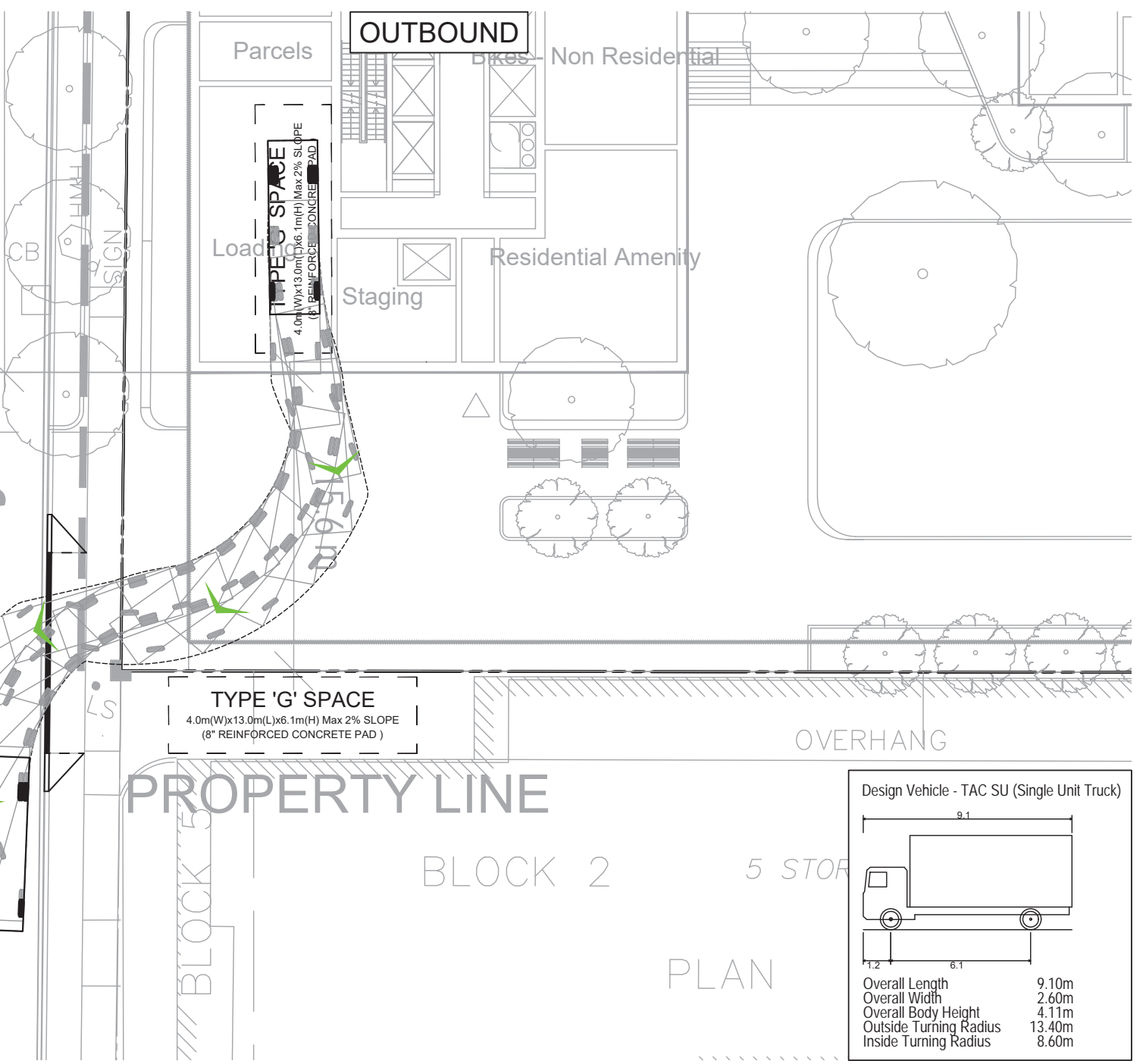
## OUTBOUND

# DREAMERS WAY

BACK OF CURB

EDGE OF ASPHALT ROAD

# Dreamers Way



**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Building 1A  
 TAC Single Unit (SU) Truck  
 Fred Victor Loading Space Unoccupied

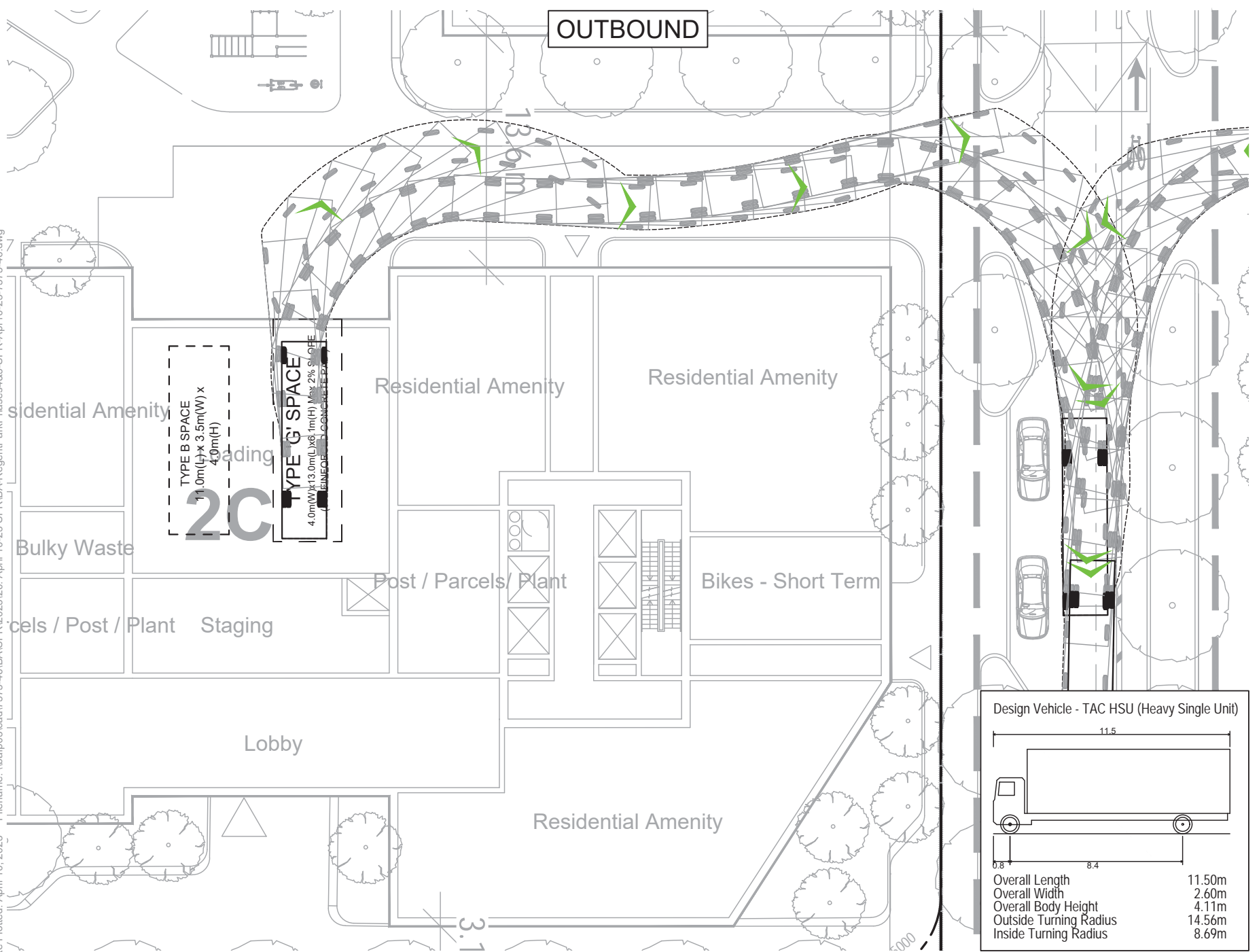
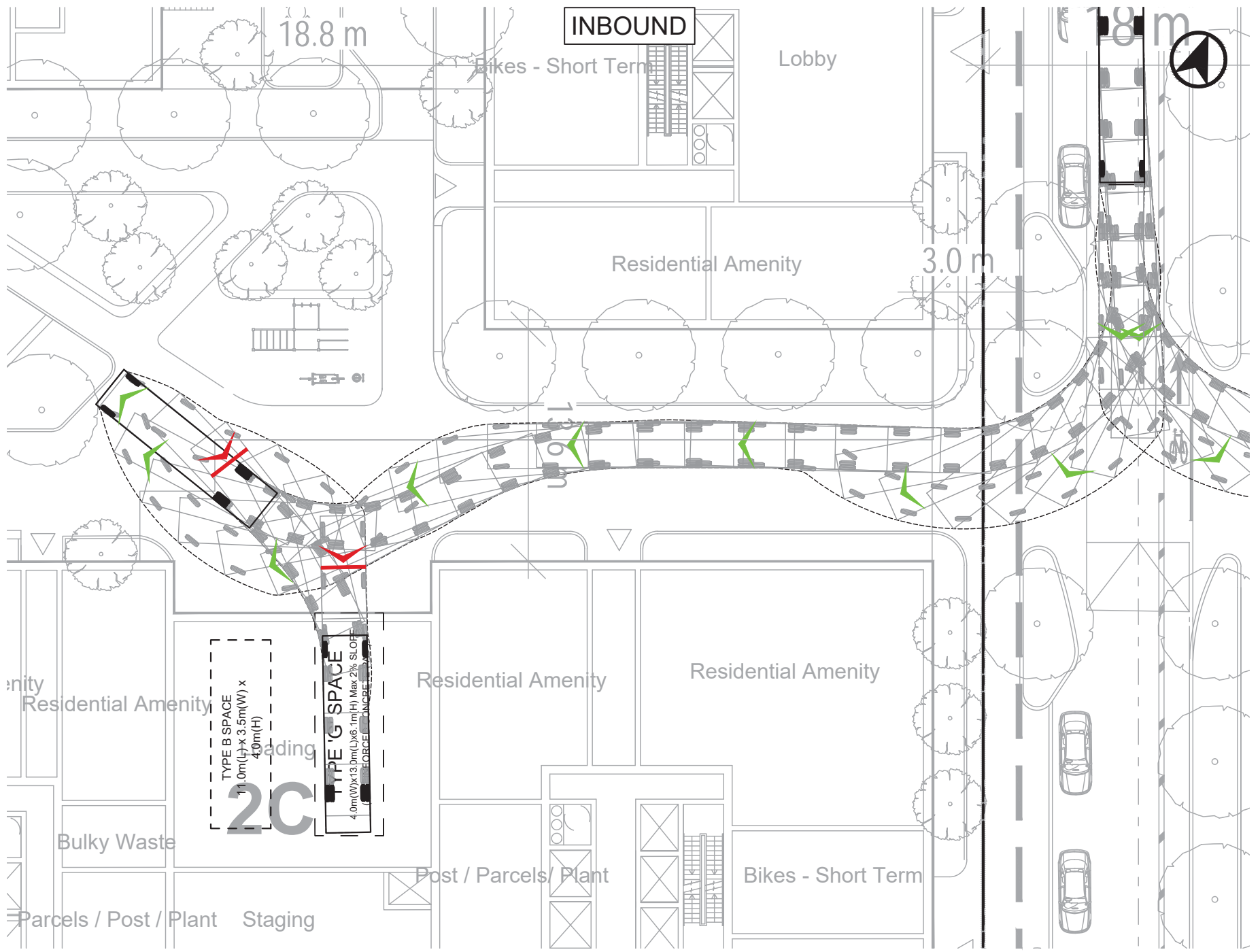
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 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-02C**







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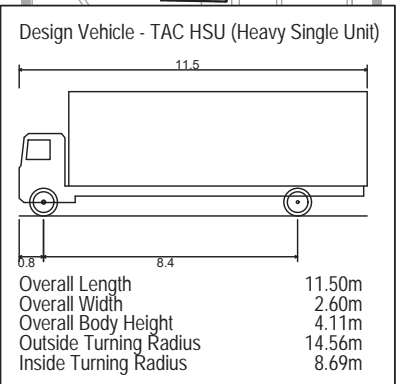
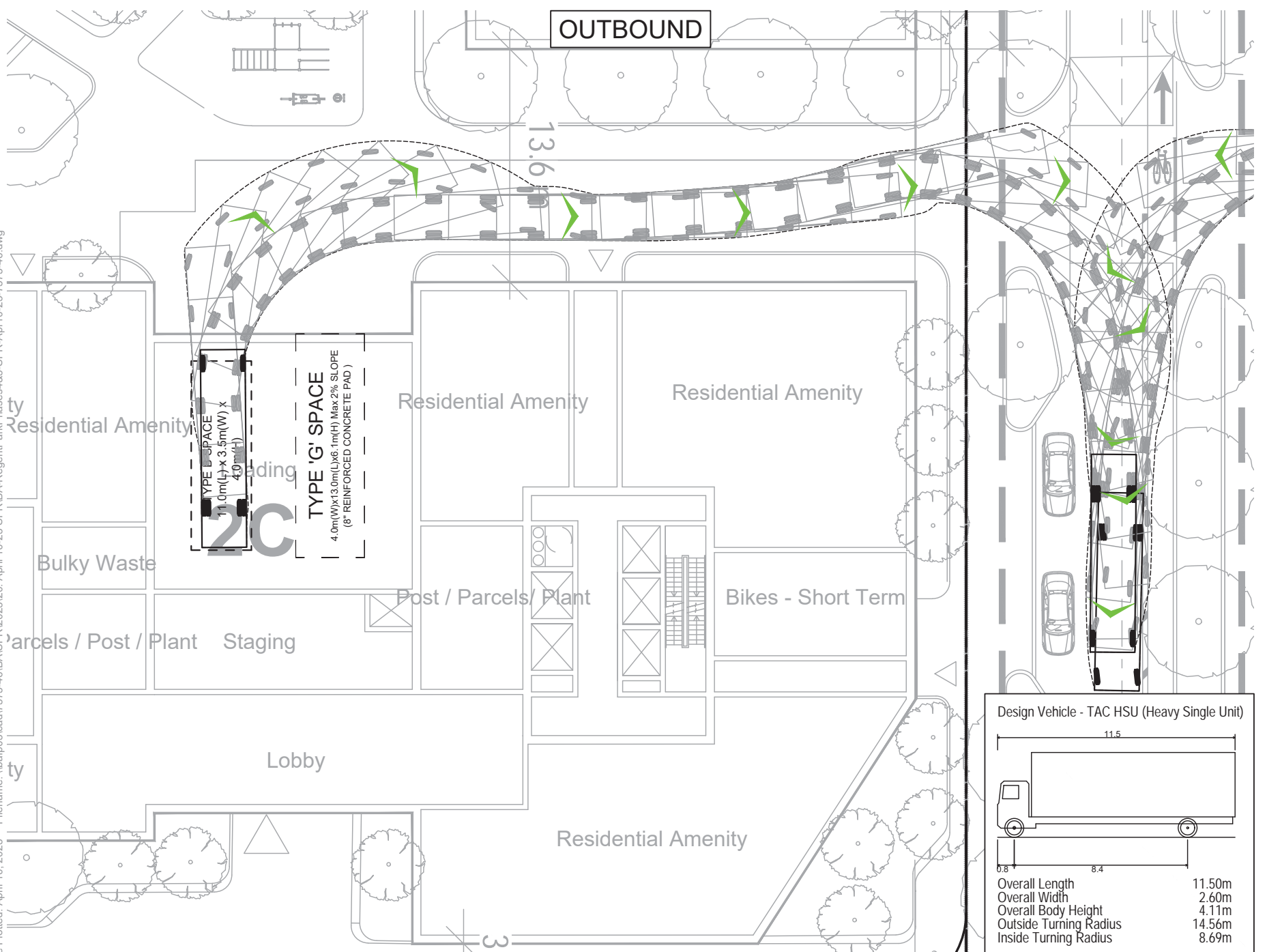
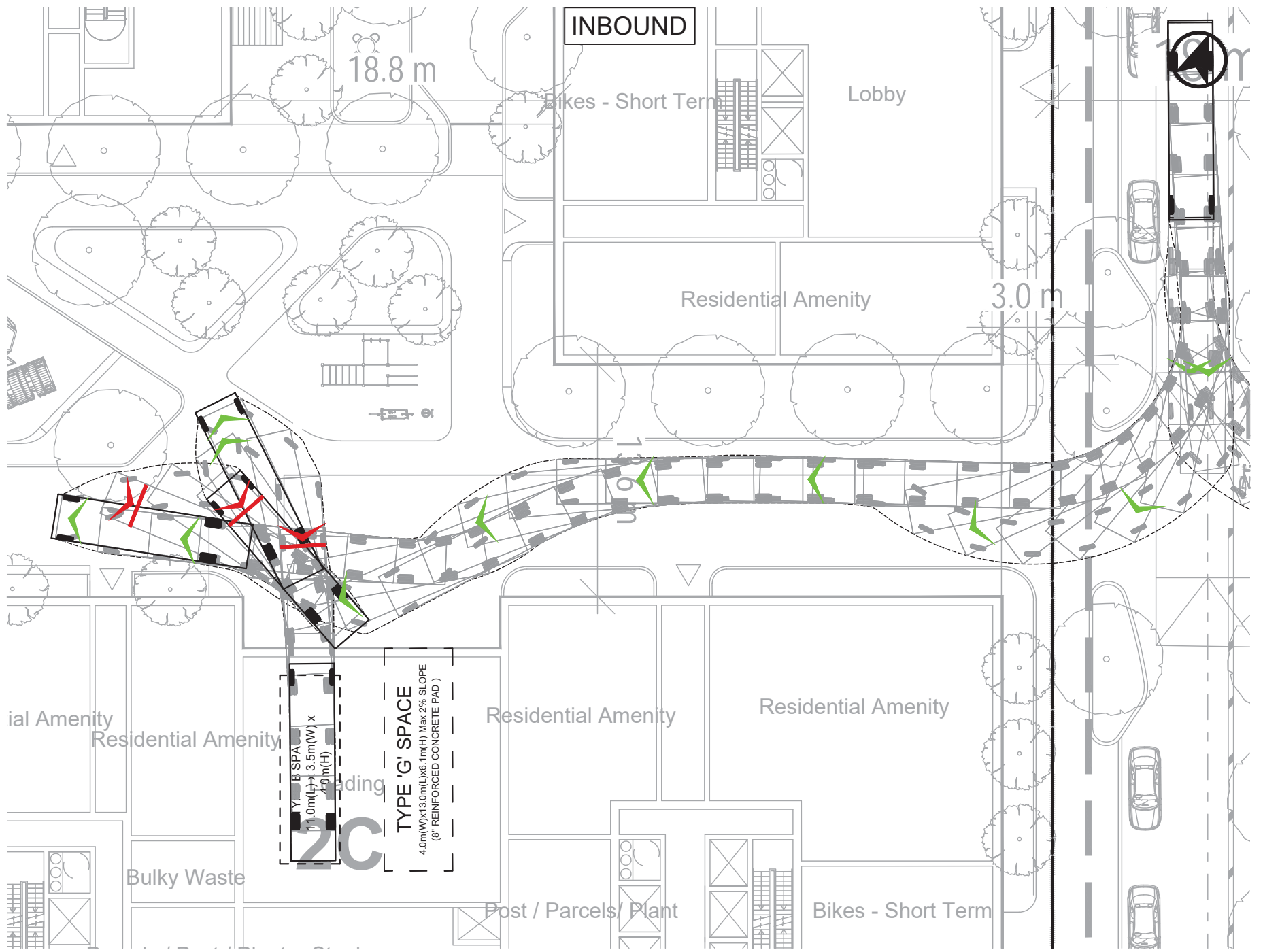
**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Buildings 2B & 2C  
 TAC Heavy Single Unit (HSU) Truck

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

Scale: 1:300

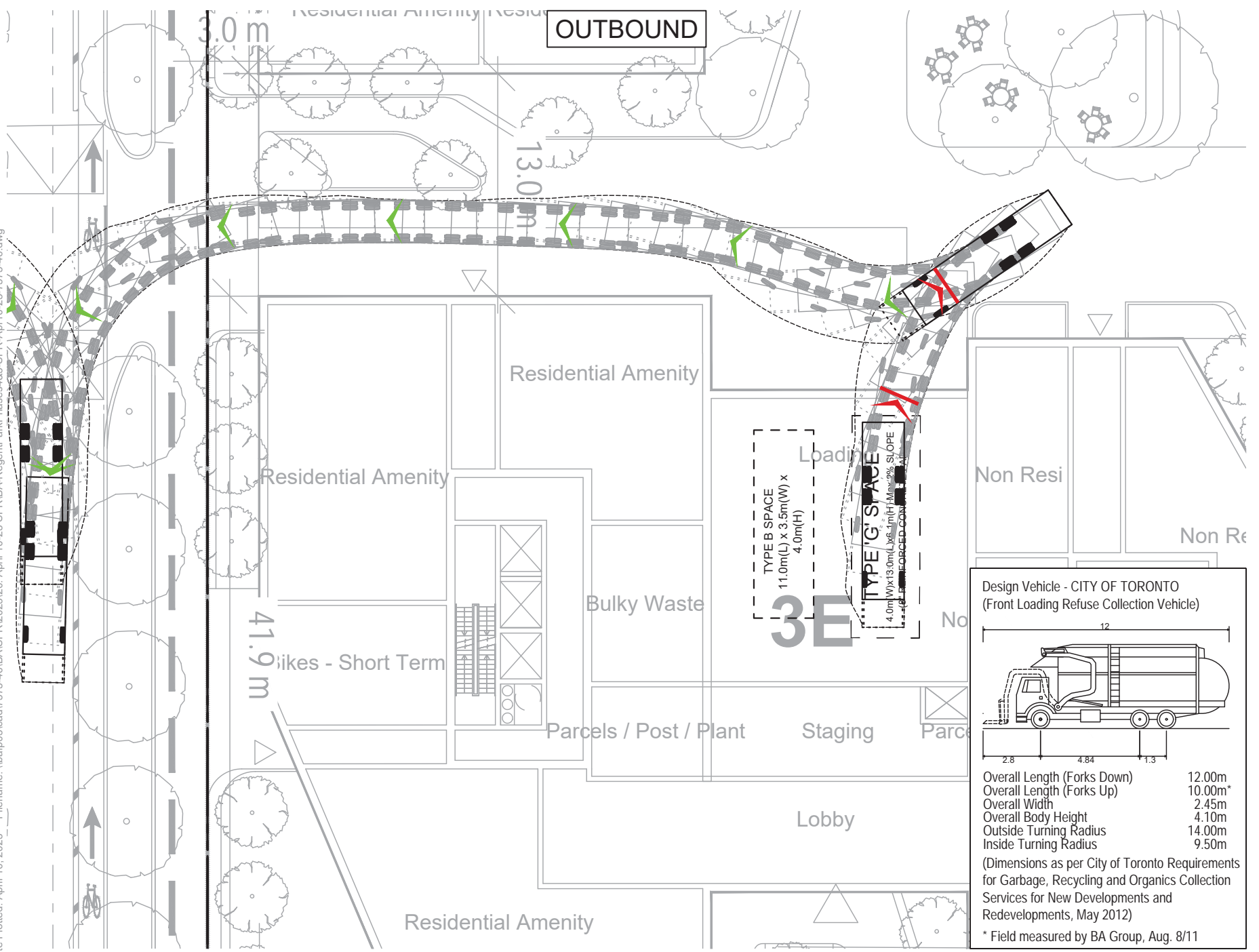
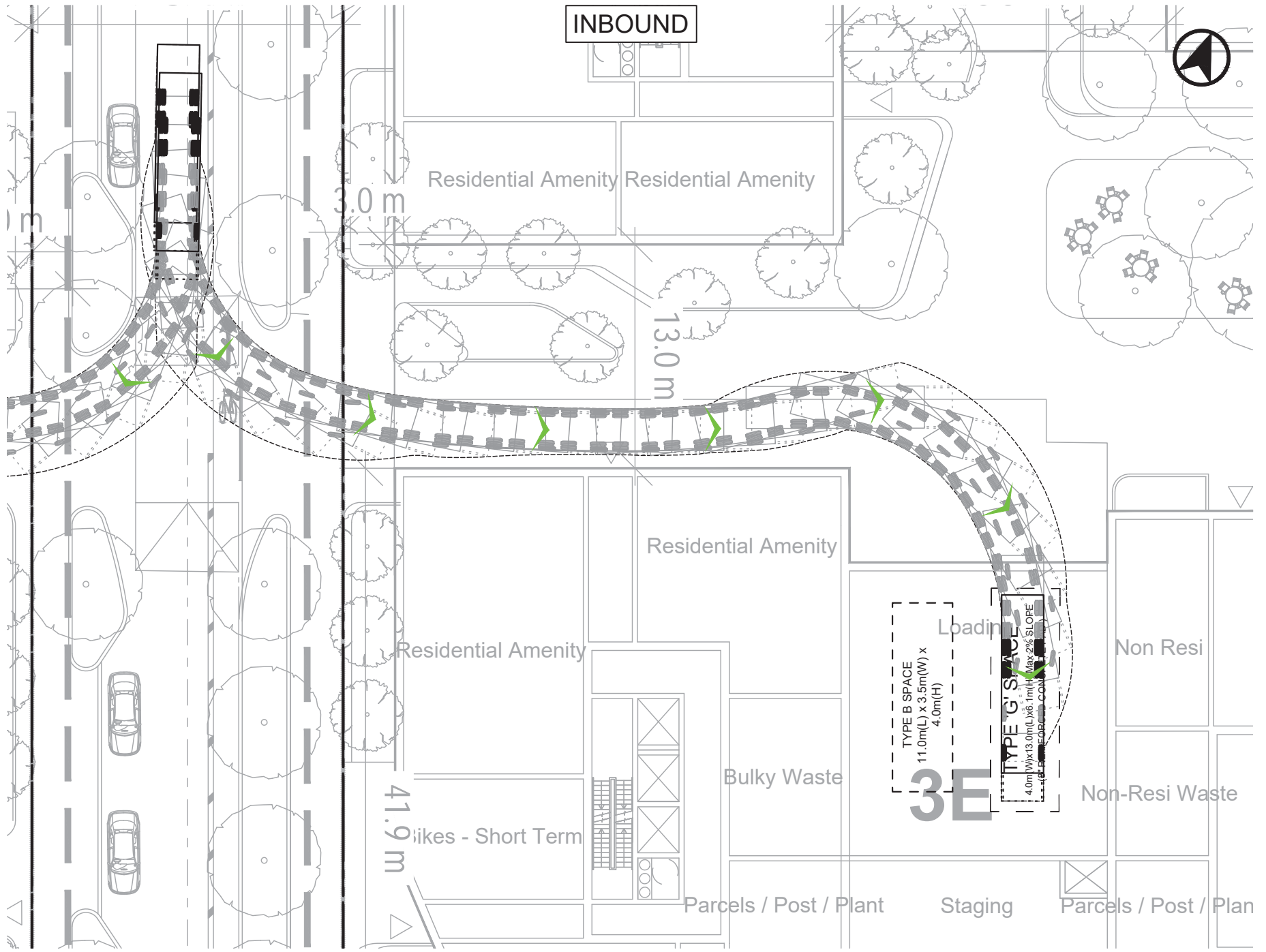
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Date Plotted: April 10, 2023 File Name: \\baip03\cad\7575-46\BANS\PR\2023\20\_April\_10-23\_SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-1575-46.dwg

	<b>REGENT PARK PHASES 4 &amp; 5</b> VEHICULAR MANOEUVRING DIAGRAM Buildings 2B & 2C TAC Heavy Single Unit (SU) Truck	Project: Regent Park Phases 4 & 5 Project No. 7575-46 Date: November 29, 2022 Revised: April 10, 2023	Scale: 1:300 
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Date Plotted: April 10, 2023 File Name: \\baip03\cad\17575-46\BANS\PR\2023\20 - April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

**Design Vehicle - CITY OF TORONTO**  
(Front Loading Refuse Collection Vehicle)

Overall Length (Forks Down)	12.00m
Overall Length (Forks Up)	10.00m*
Overall Width	2.45m
Overall Body Height	4.10m
Outside Turning Radius	14.00m
Inside Turning Radius	9.50m

(Dimensions as per City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments, May 2012)  
\* Field measured by BA Group, Aug. 8/11



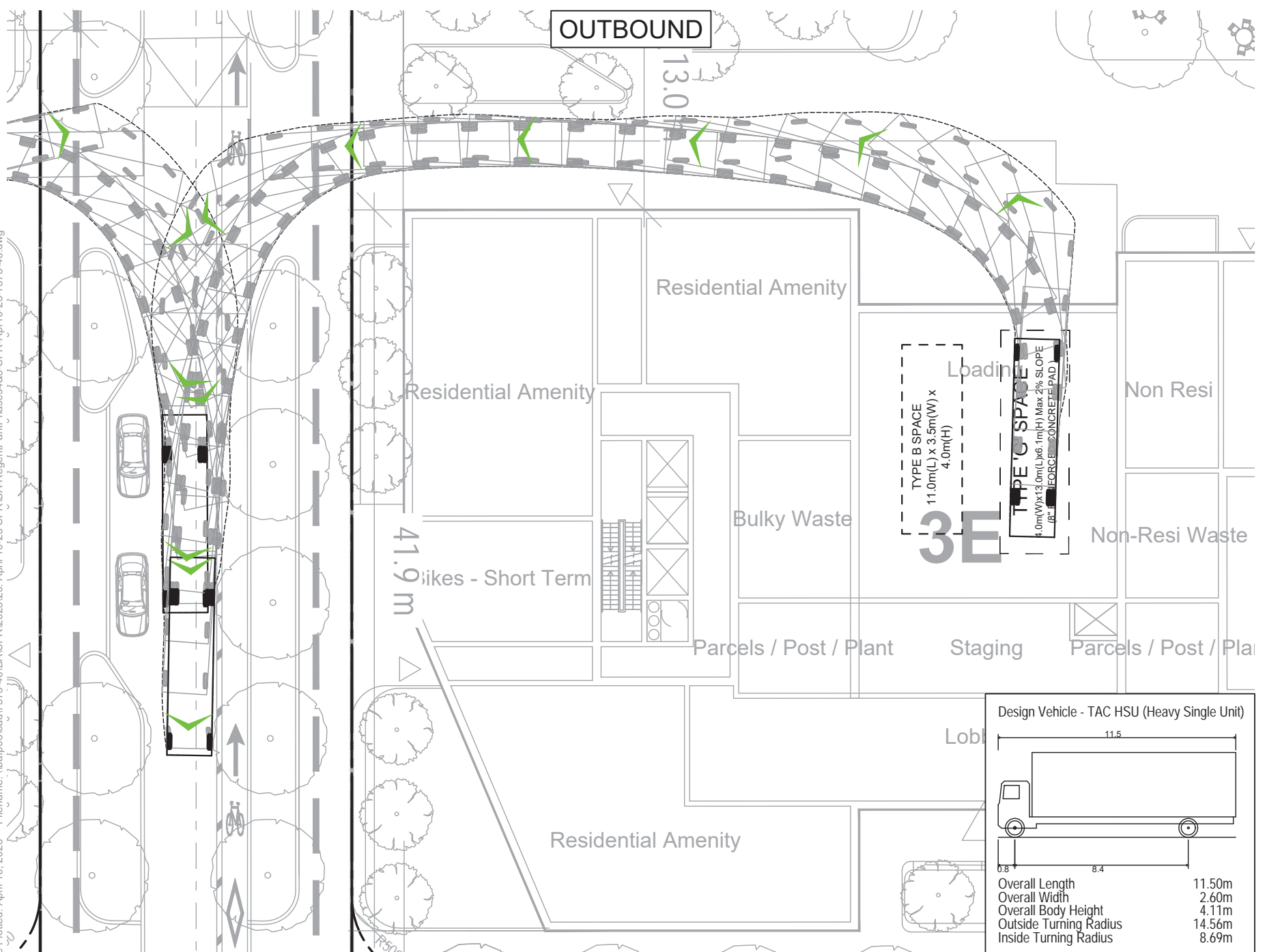
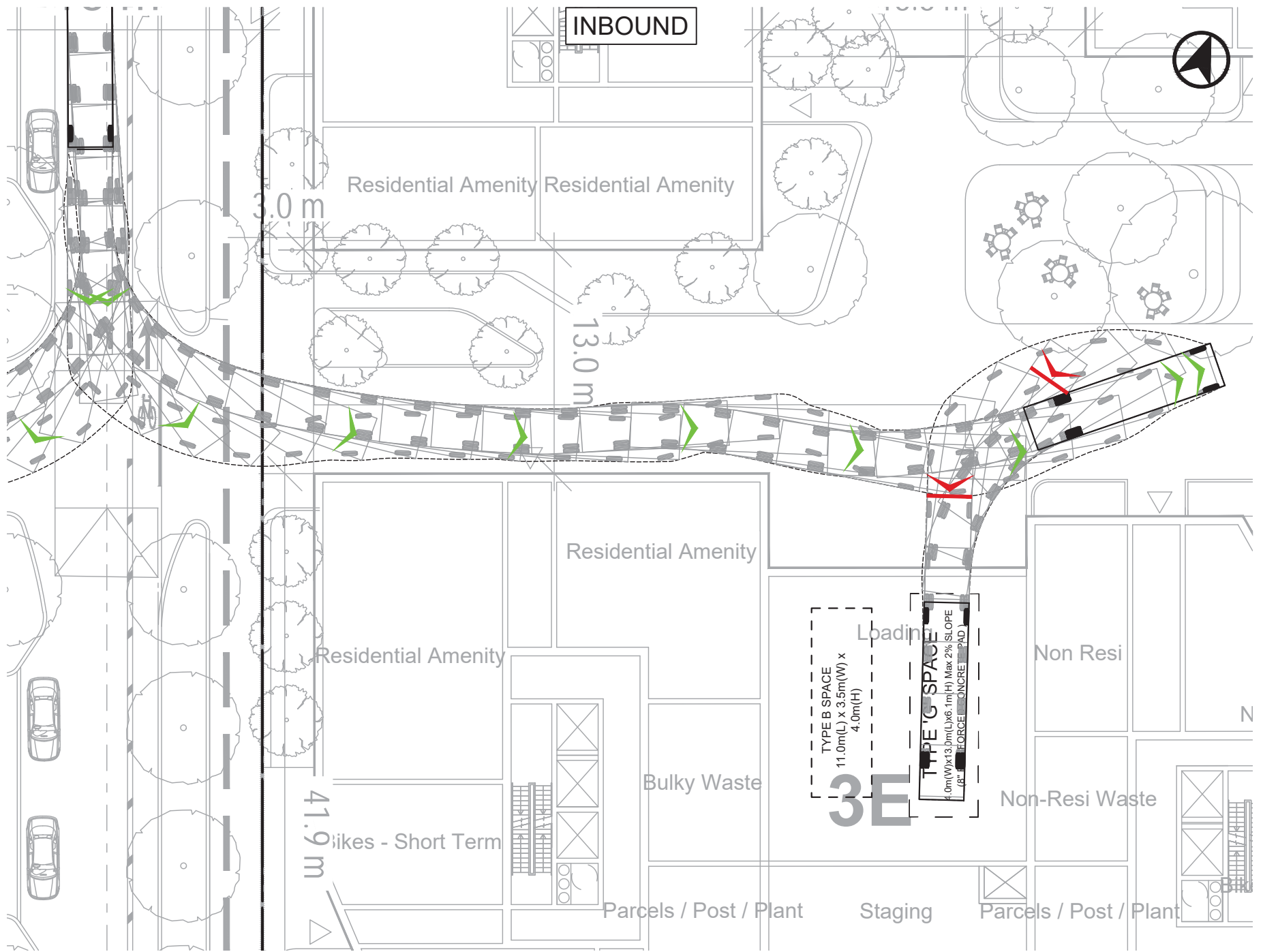
**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Buildings 3D & 3E  
City of Toronto Front Loading Garbage Truck

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

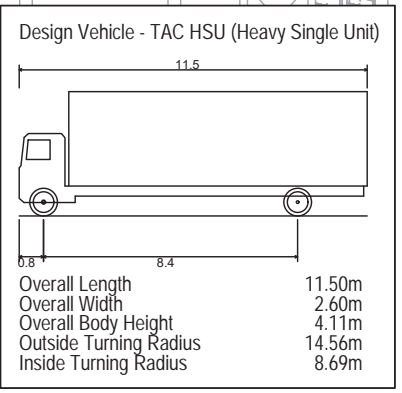
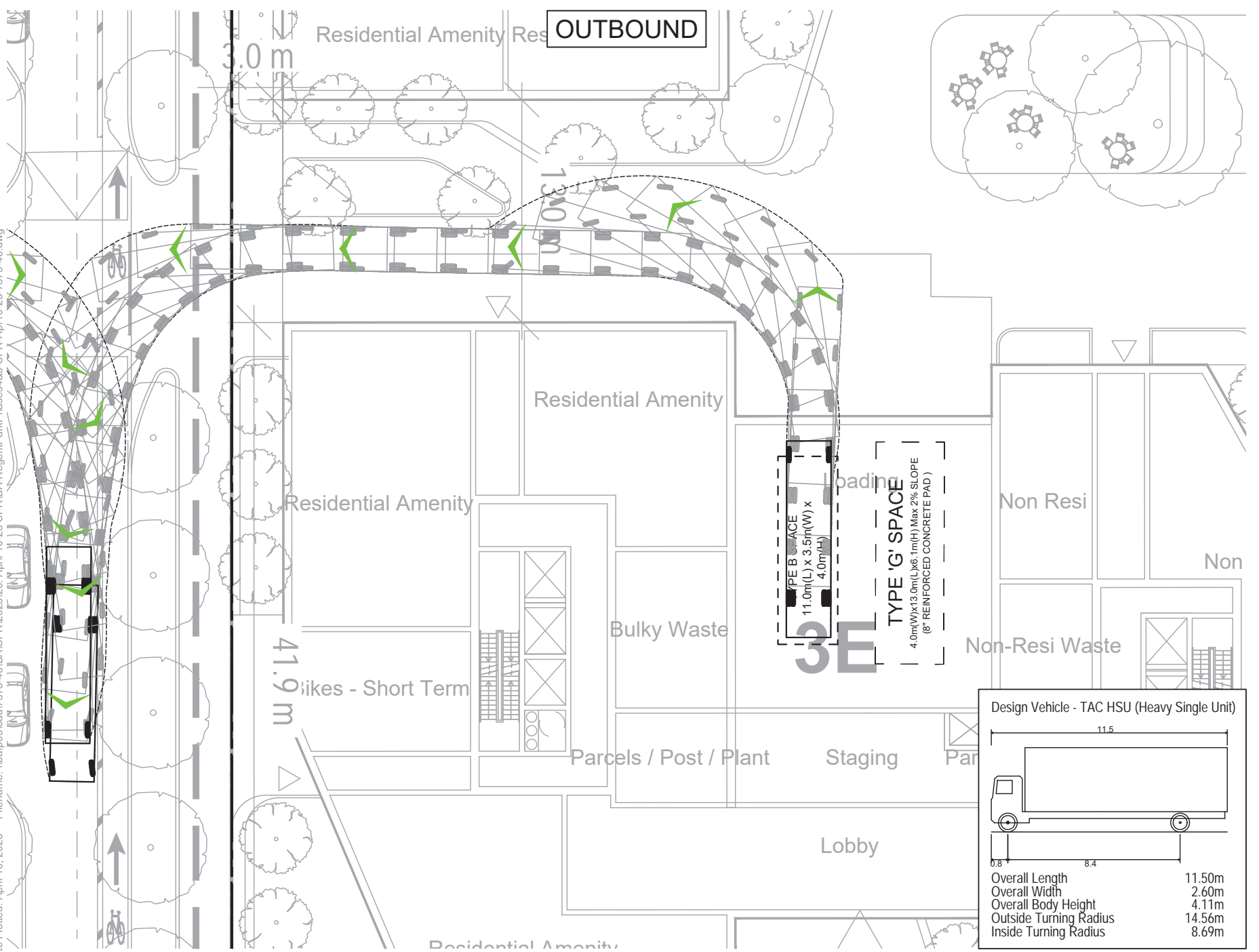
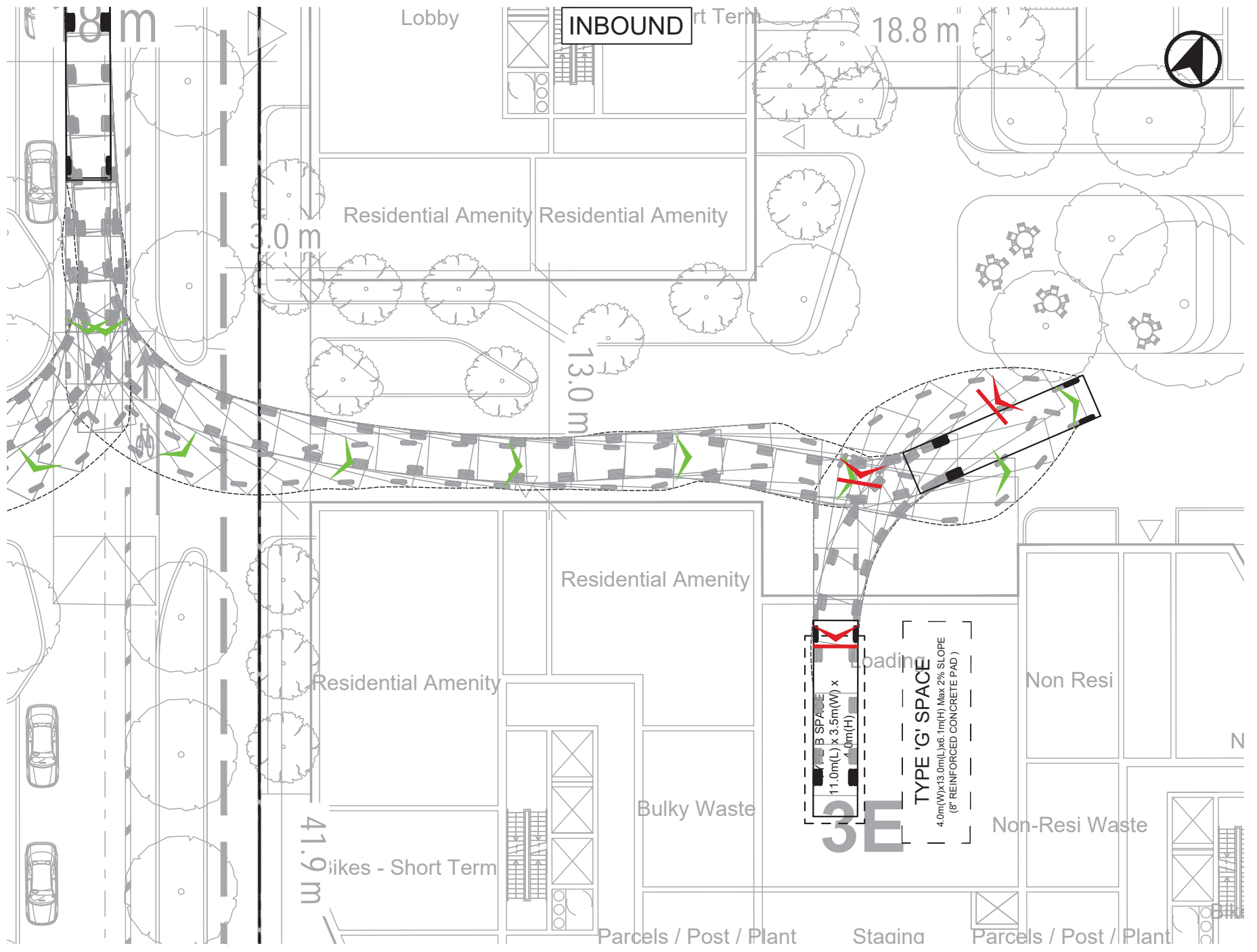
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Date Plotted: April 10, 2023 File name: \\baip03\cad\7575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

	<b>REGENT PARK PHASES 4 &amp; 5</b> VEHICULAR MANOEUVRING DIAGRAM Buildings 3D & 3E TAC Heavy Single Unit (HSU) Truck	Project: Regent Park Phases 4 & 5 Project No. 7575-46 Date: November 29, 2022 Revised: April 10, 2023	Scale 1:300
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Date Plotted: April 10, 2023 File Name: \\baip03\cad\17575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-17575-46.dwg



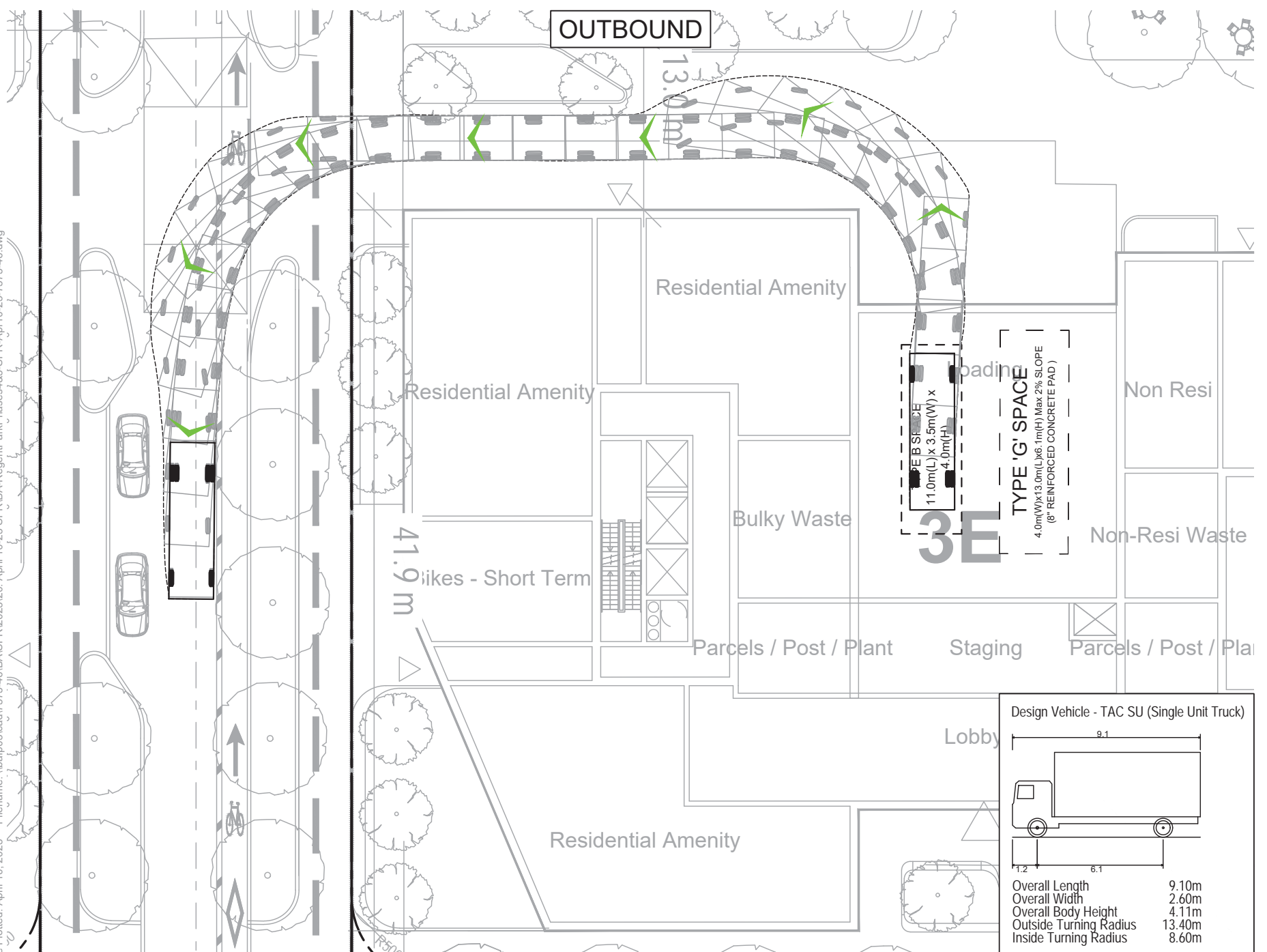
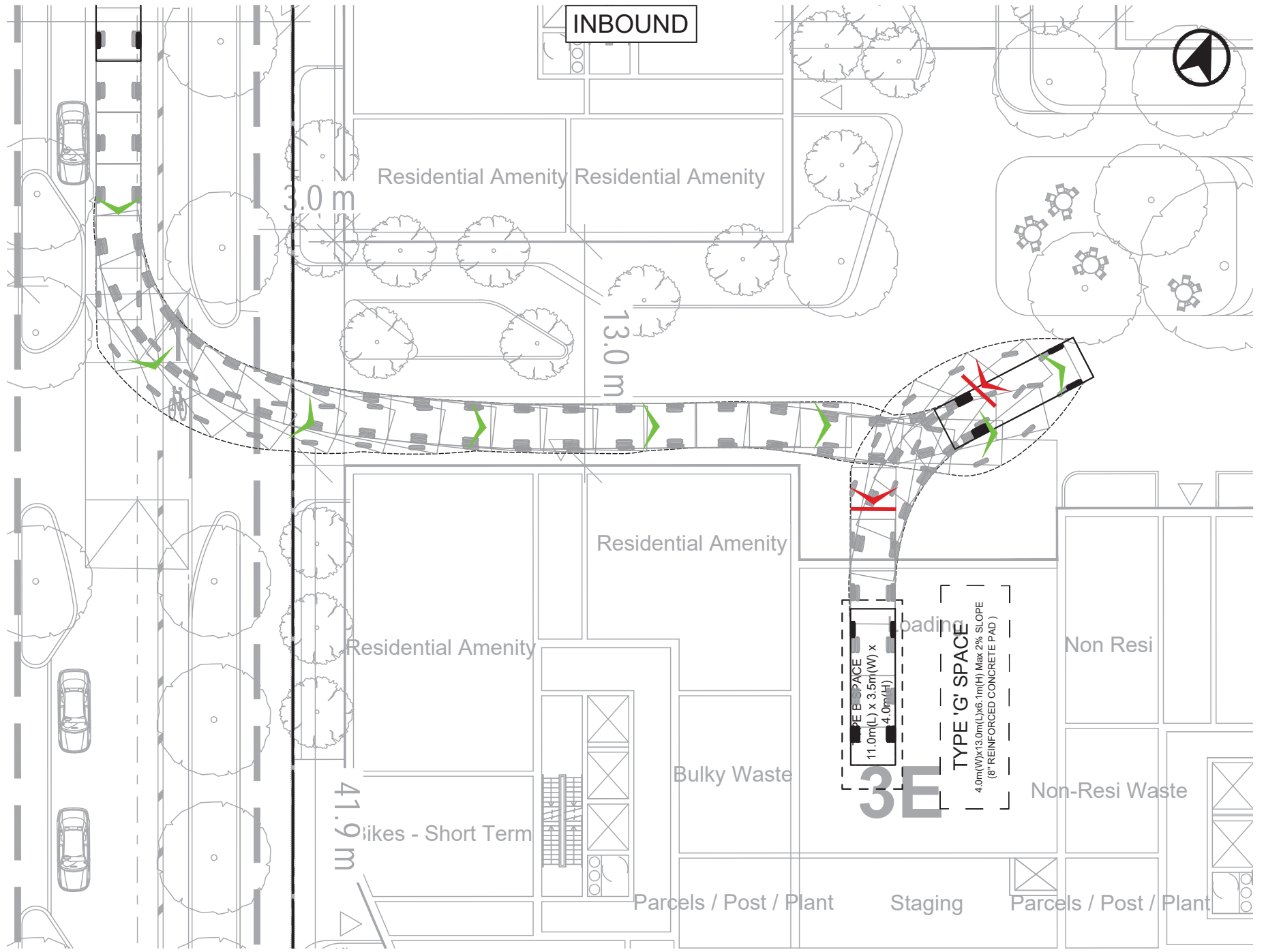
**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Buildings 3D & 3E  
TAC Heavy Single Unit (HSU) Truck

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

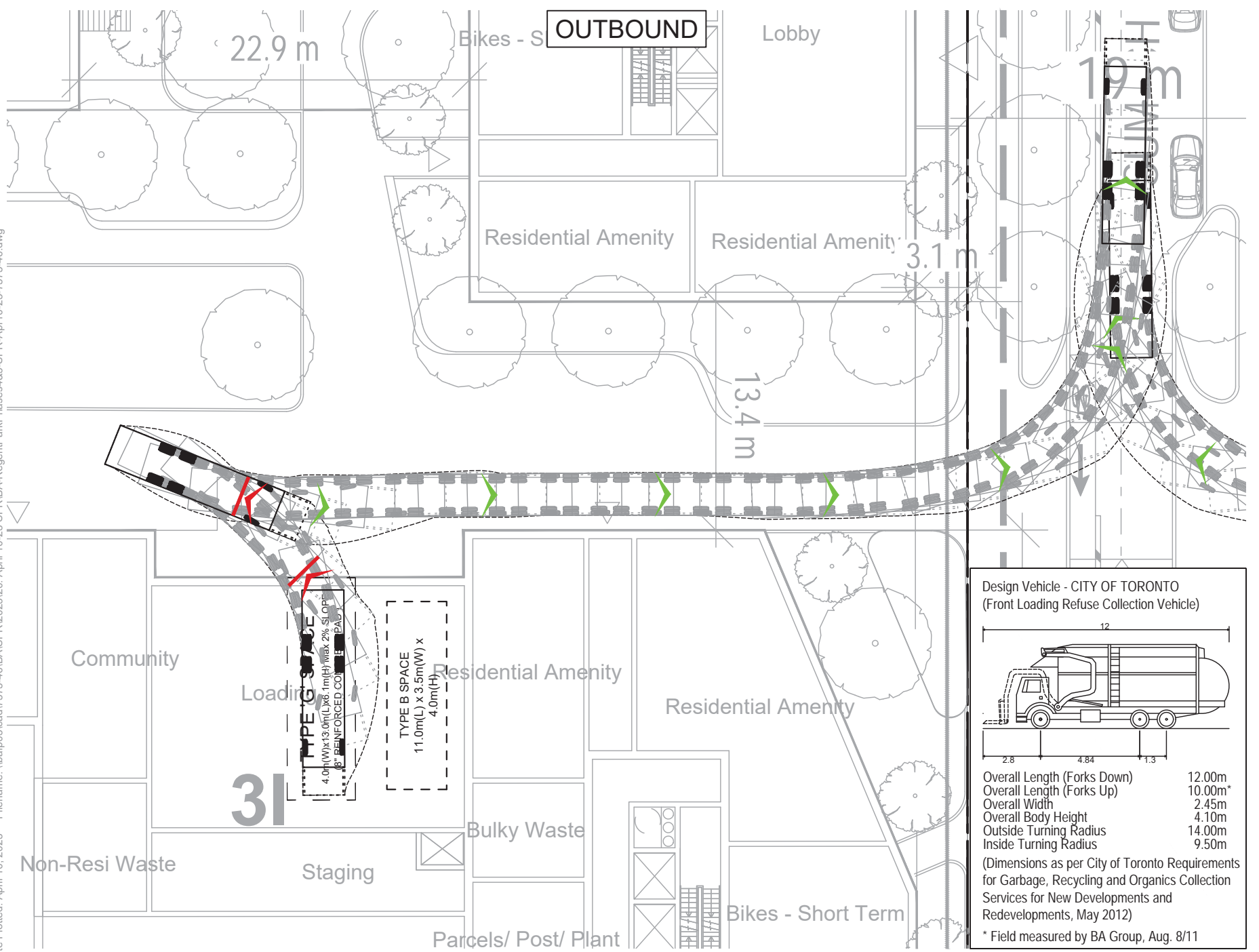
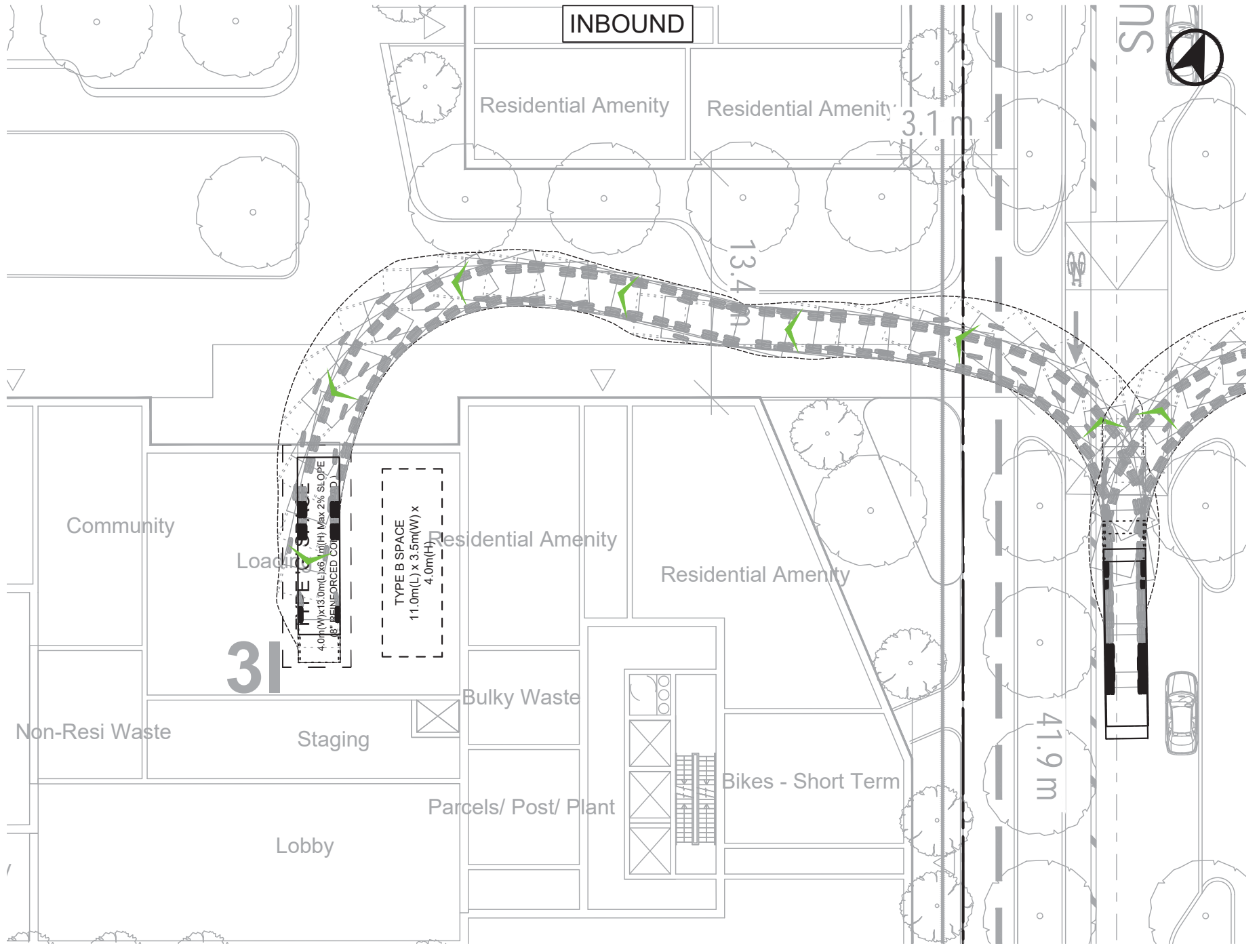
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	<b>REGENT PARK PHASES 4 &amp; 5</b> VEHICULAR MANOEUVRING DIAGRAM Buildings 3D & 3E TAC Single Unit (SU) Truck	Project: Regent Park Phases 4 & 5 Project No. 7575-46 Date: November 29, 2022 Revised: April 10, 2023	Scale 1:300
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**Design Vehicle - CITY OF TORONTO**  
(Front Loading Refuse Collection Vehicle)

Overall Length (Forks Down)	12.00m
Overall Length (Forks Up)	10.00m*
Overall Width	2.45m
Overall Body Height	4.10m
Outside Turning Radius	14.00m
Inside Turning Radius	9.50m

(Dimensions as per City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments, May 2012)  
\* Field measured by BA Group, Aug. 8/11

Date Plotted: April 10, 2023 File name: \\baip03\cad\7575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg



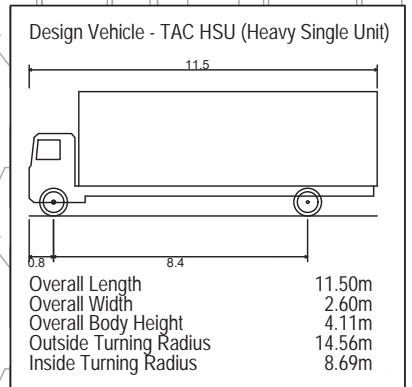
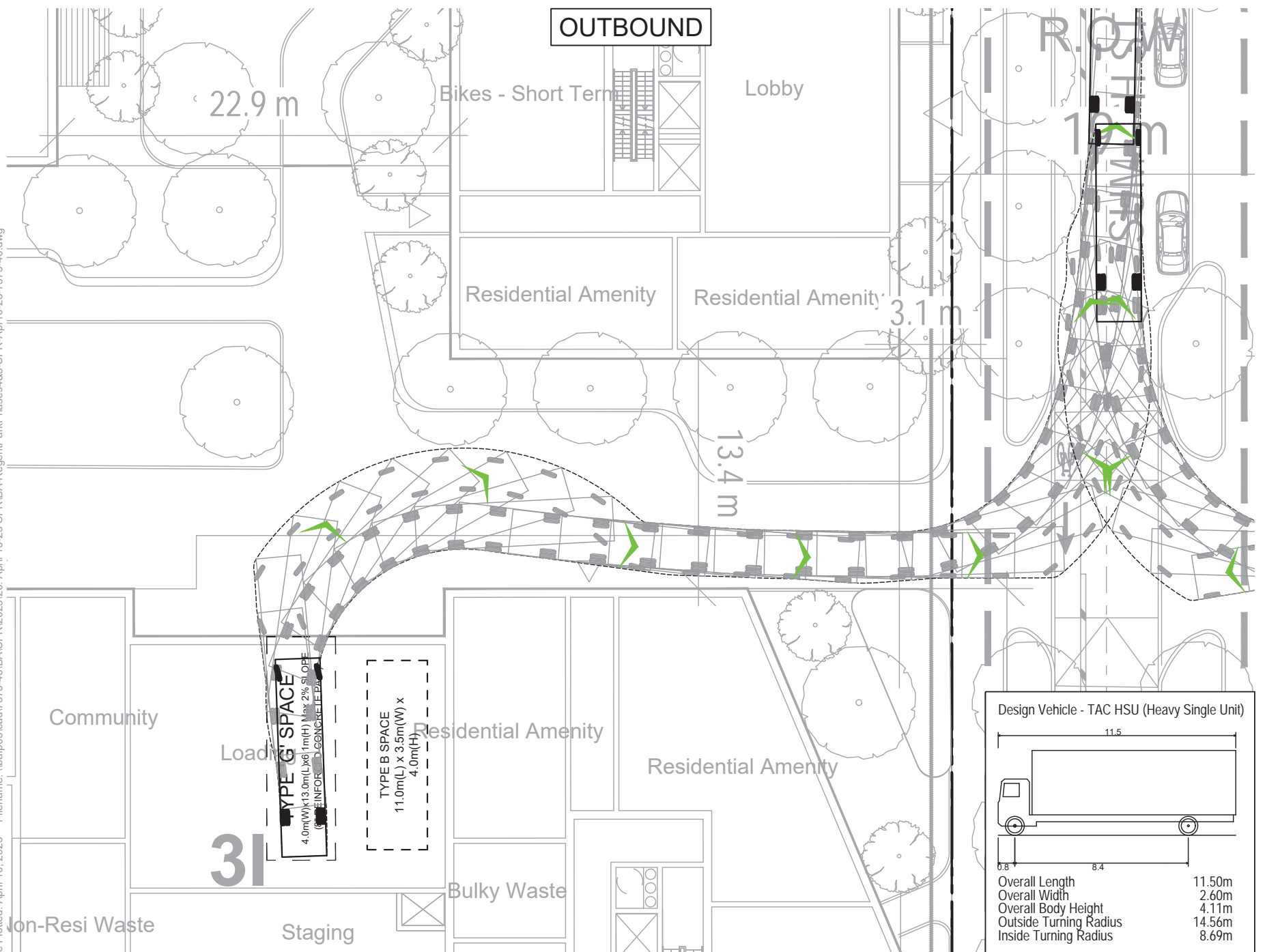
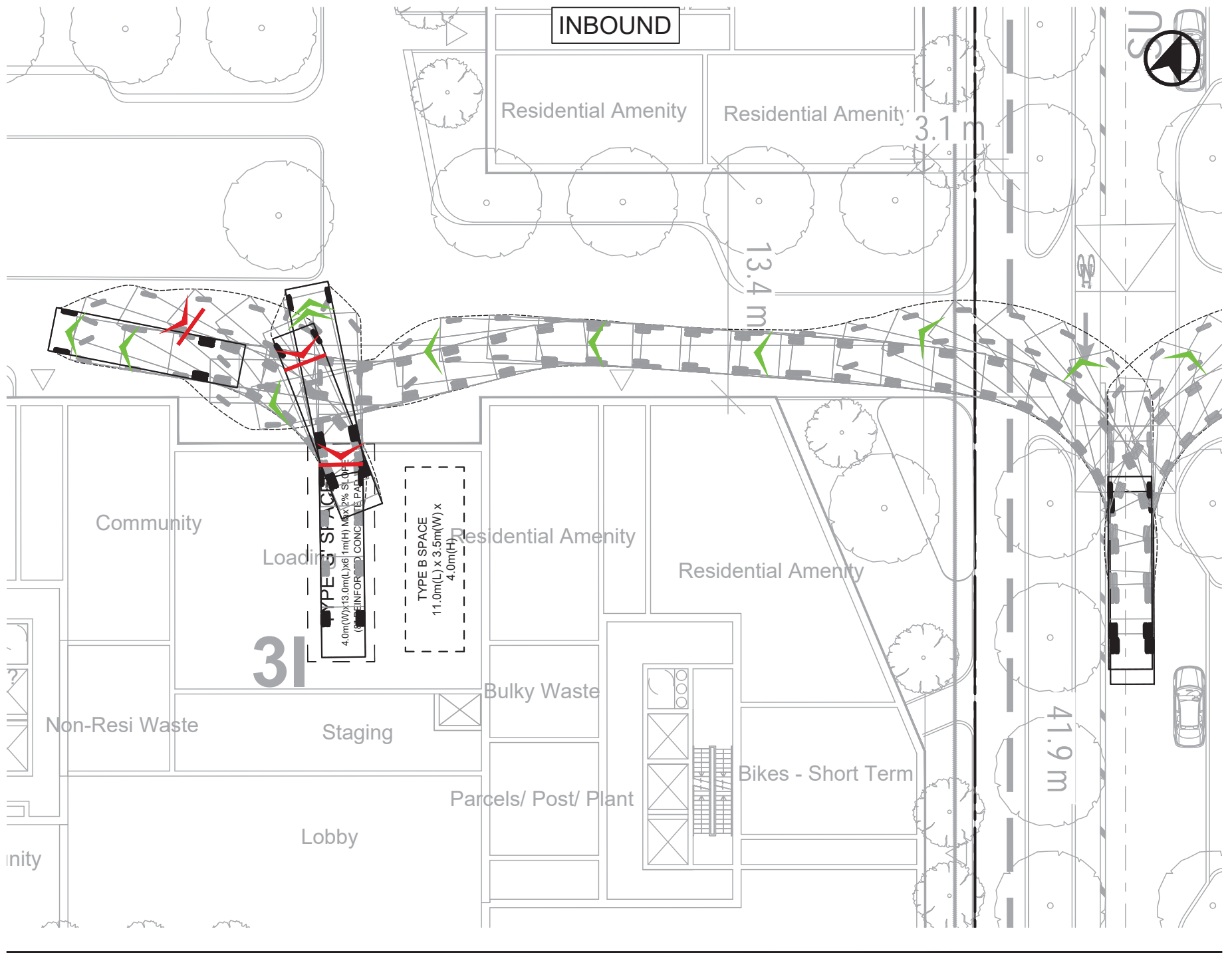
**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Buildings 3H & 3I  
City of Toronto Front Loading Garbage Truck

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-05A**





Date Plotted: April 10, 2023 Filename: \\baip03\cad\7575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

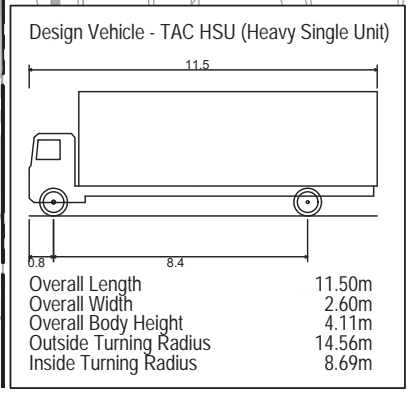
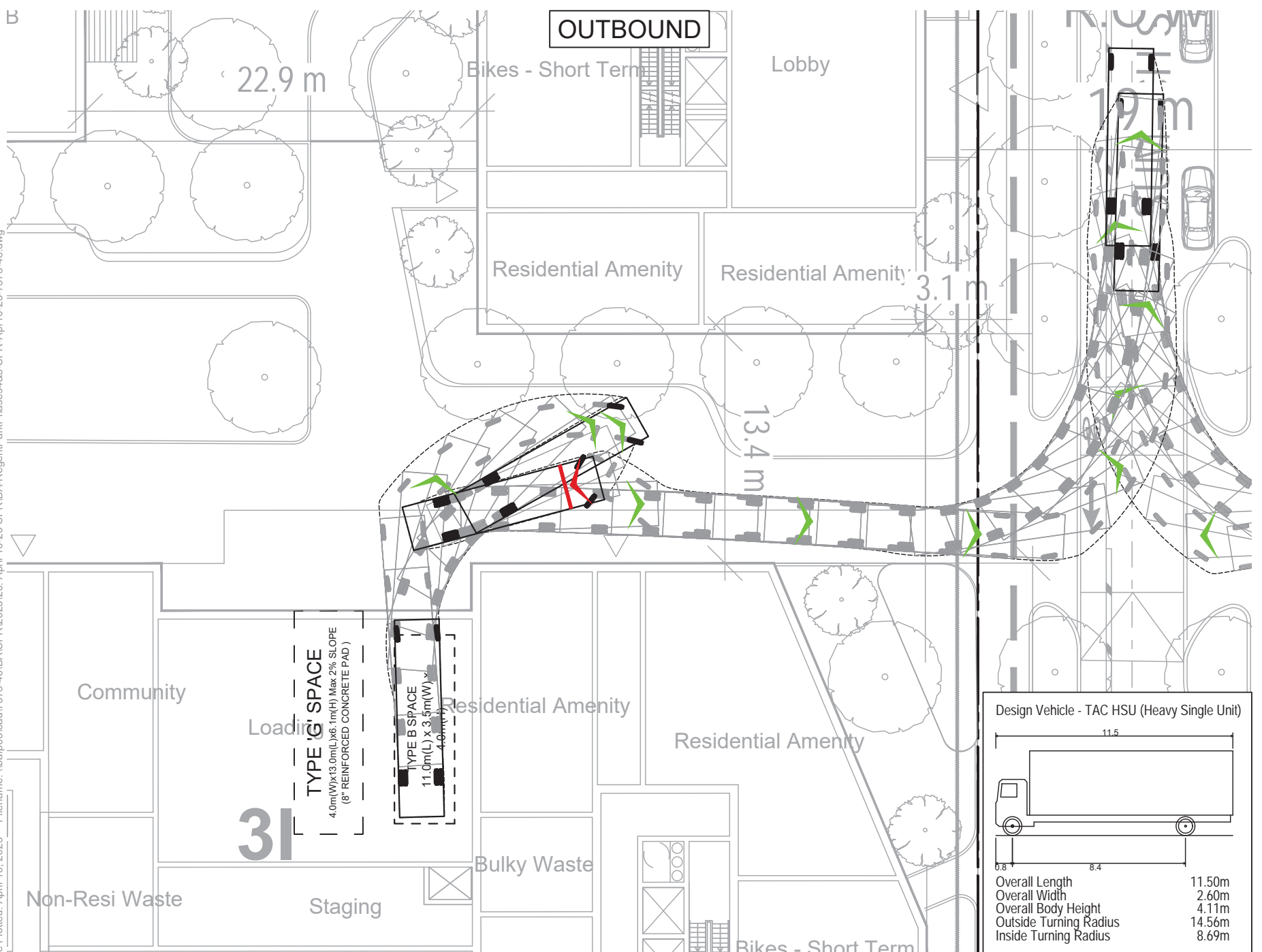
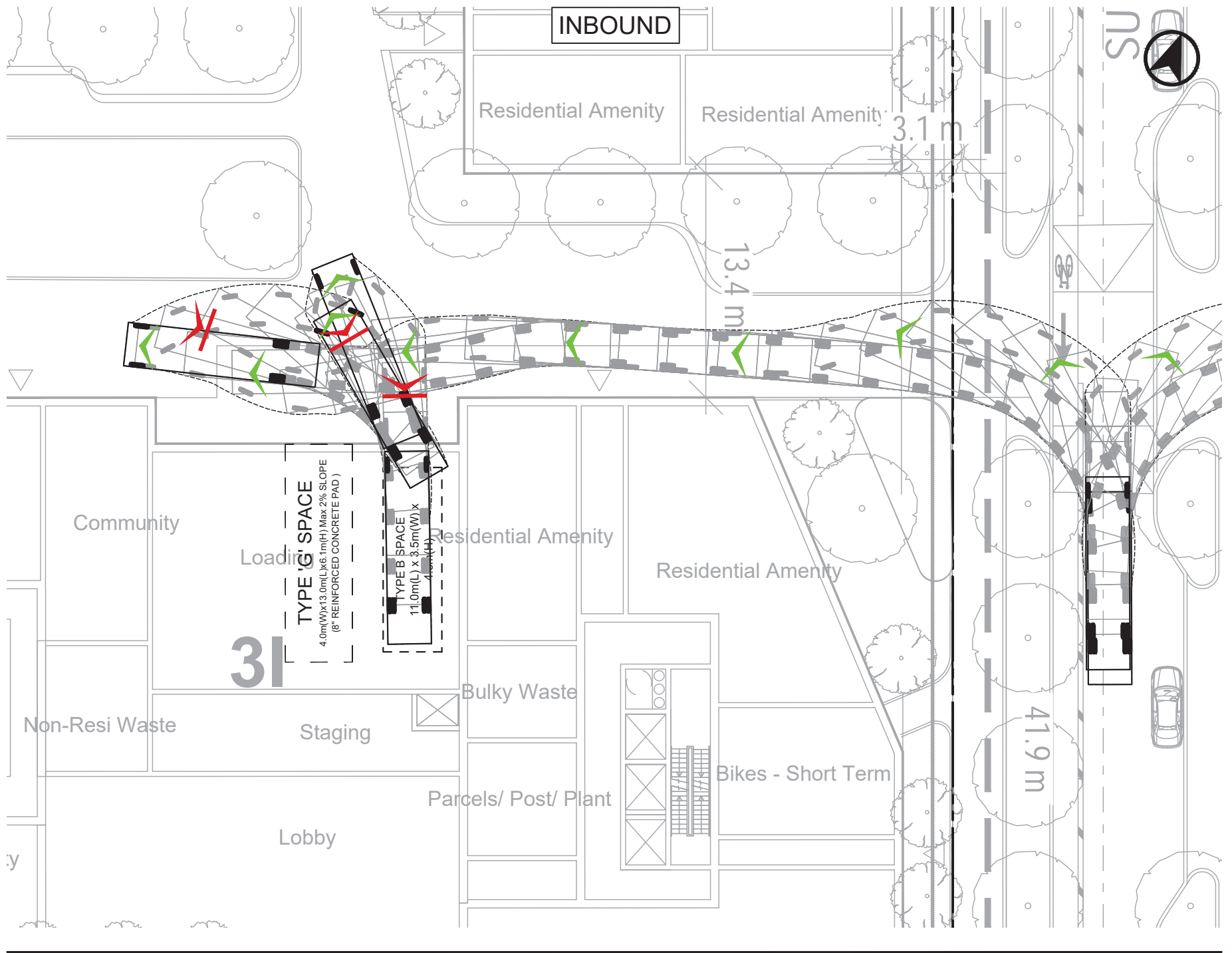


**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Buildings 3H & 3I  
TAC Heavy Single Unit (HSU) Truck

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

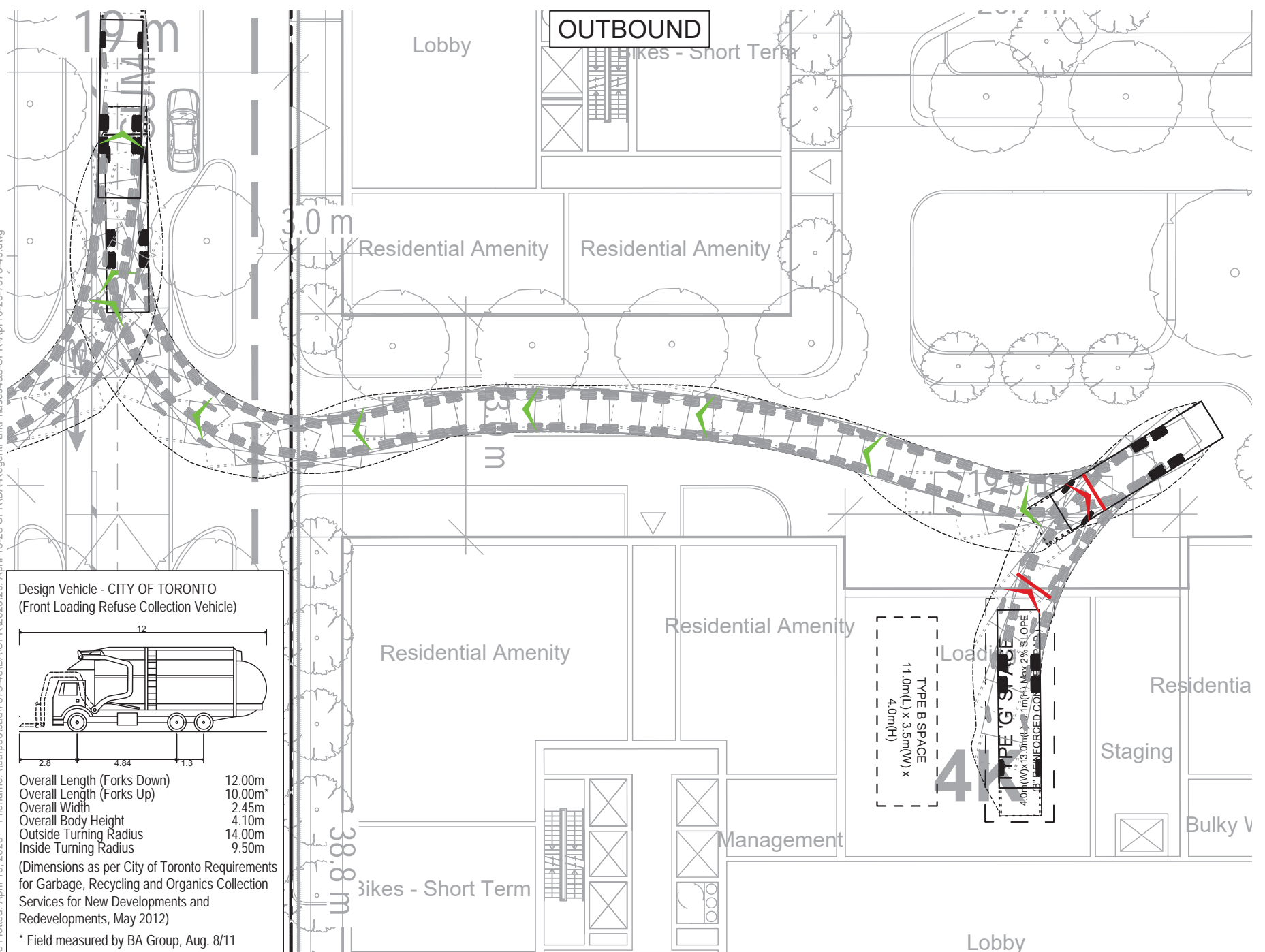
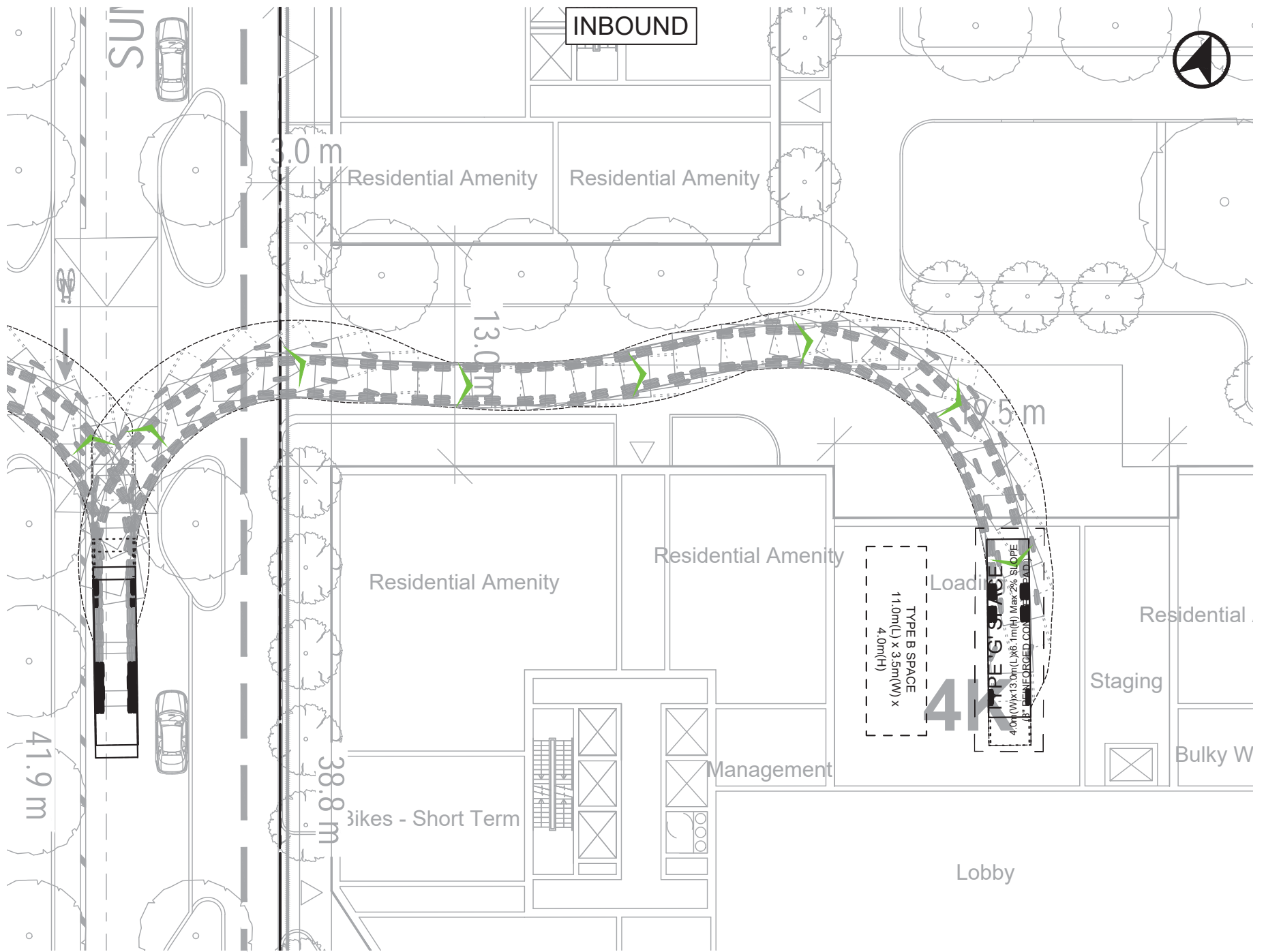
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Date Plotted: April 10, 2023 File name: \\bajip03\cad\7575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

	<b>REGENT PARK PHASES 4 &amp; 5</b> VEHICULAR MANOEUVRING DIAGRAM Buildings 3H & 3I TAC Heavy Single Unit (HSU) Truck	Project: Regent Park Phases 4 & 5 Project No. 7575-46 Date: November 29, 2022 Revised: April 10, 2023	Scale: 1:300 
		Drawing No. <b>VMD-05C</b>	





Date Plotted: April 10, 2023 File name: \\baip03\cad\17575-46\BANS\PR\2023\20\_April 10-23\_SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-17575-46.dwg

**Design Vehicle - CITY OF TORONTO**  
(Front Loading Refuse Collection Vehicle)

Overall Length (Forks Down)	12.00m
Overall Length (Forks Up)	10.00m*
Overall Width	2.45m
Overall Body Height	4.10m
Outside Turning Radius	14.00m
Inside Turning Radius	9.50m

(Dimensions as per City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments, May 2012)  
\* Field measured by BA Group, Aug. 8/11

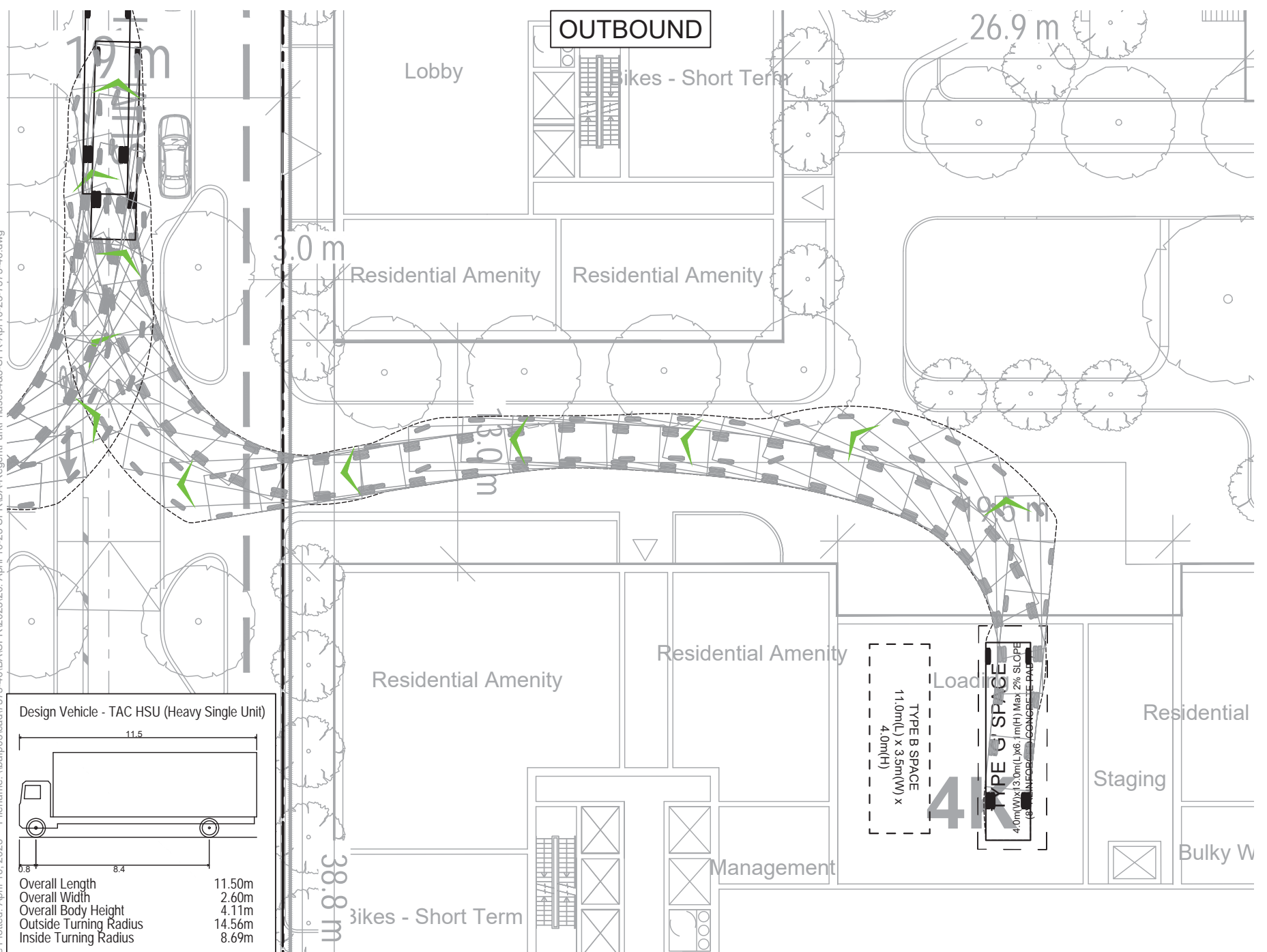
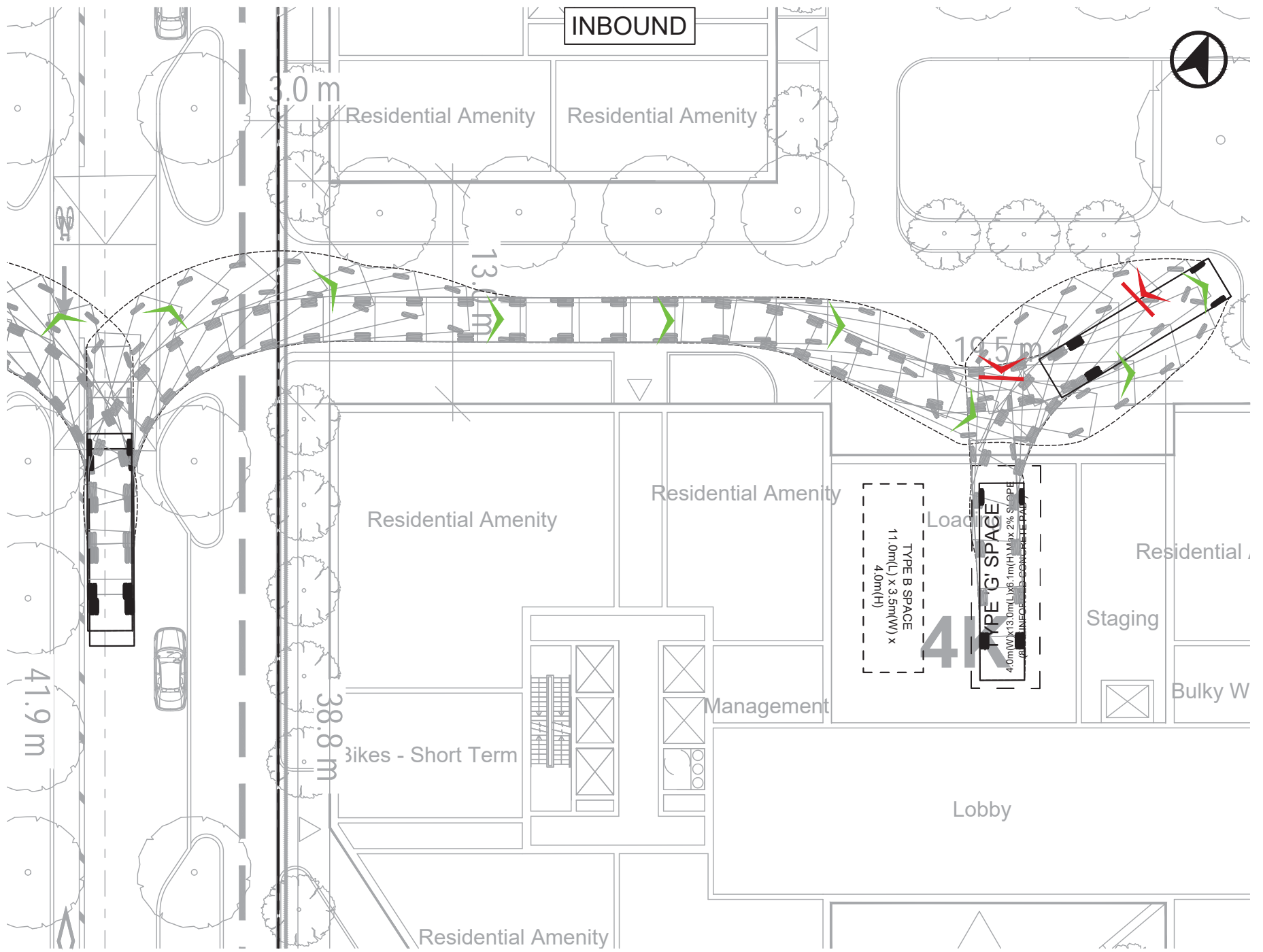


**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
Buildings 4J & 4K  
City of Toronto Front Loading Garbage Truck

Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-06A**



Date Plotted: April 10, 2023 File name: \\baip03\cad\7575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

**Design Vehicle - TAC HSU (Heavy Single Unit)**

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m



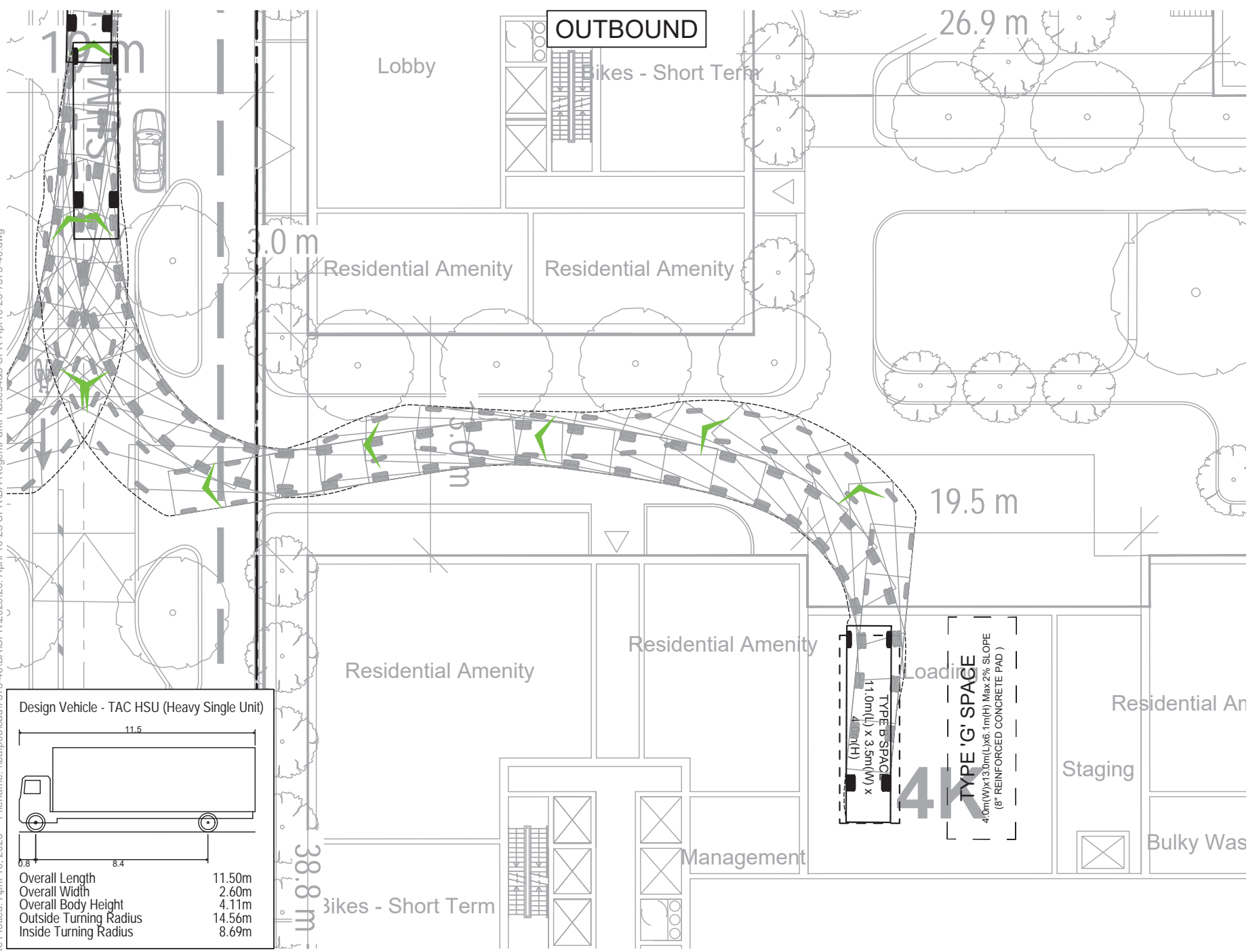
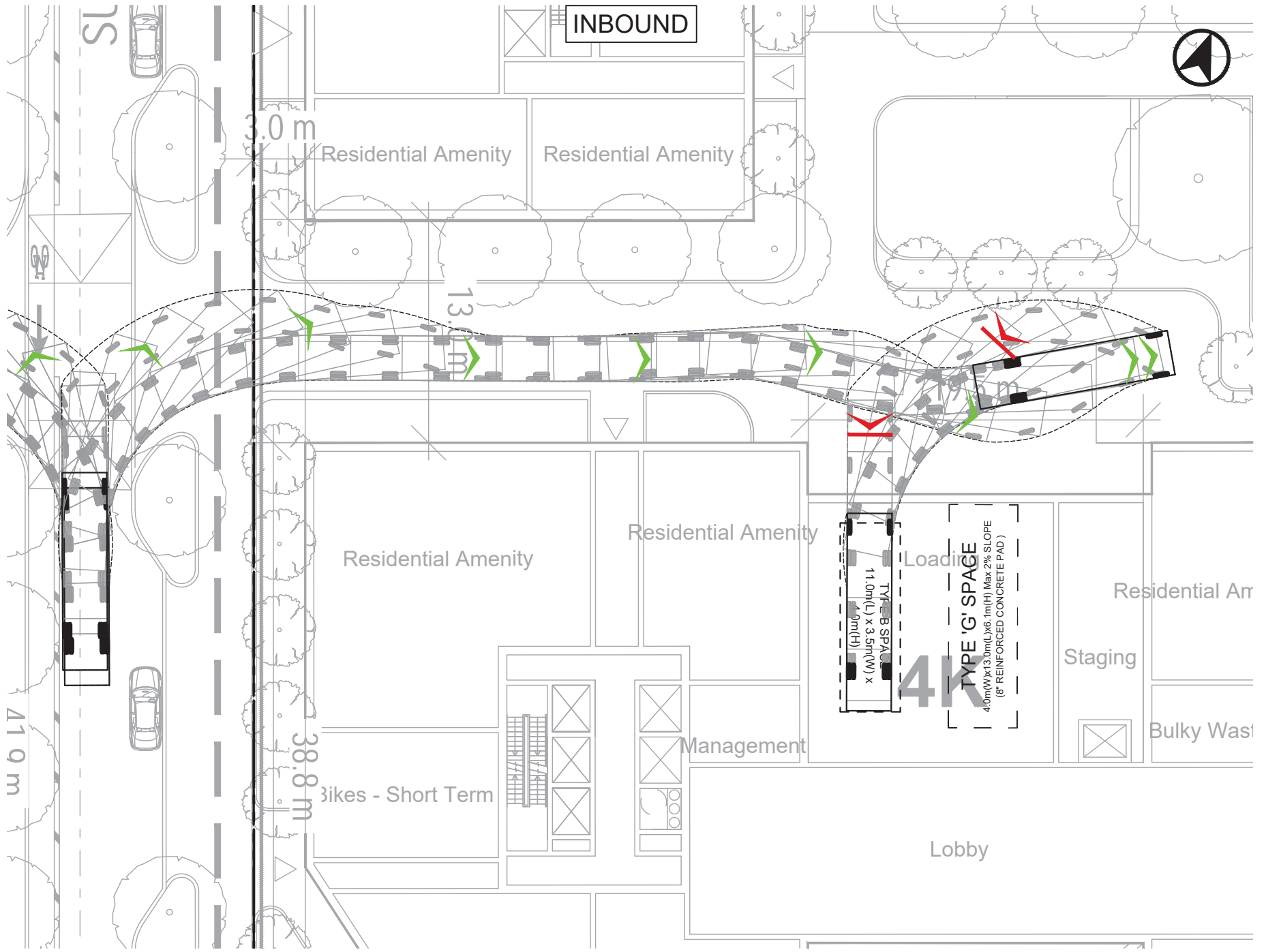
**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Buildings 4J & 4K  
 TAC Heavy Single Unit (HSU) Truck

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

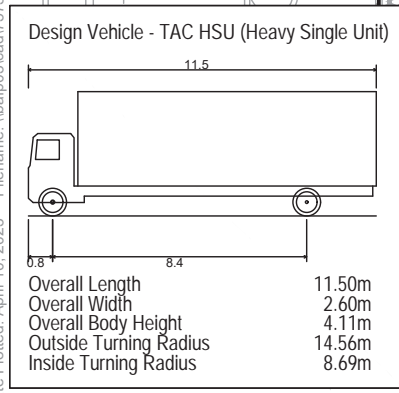
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Date Plotted: April 10, 2023 File name: \\baip03\cad\17575-46\BANS\PR\2023\20\_April\_10-23\_SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-17575-46.dwg

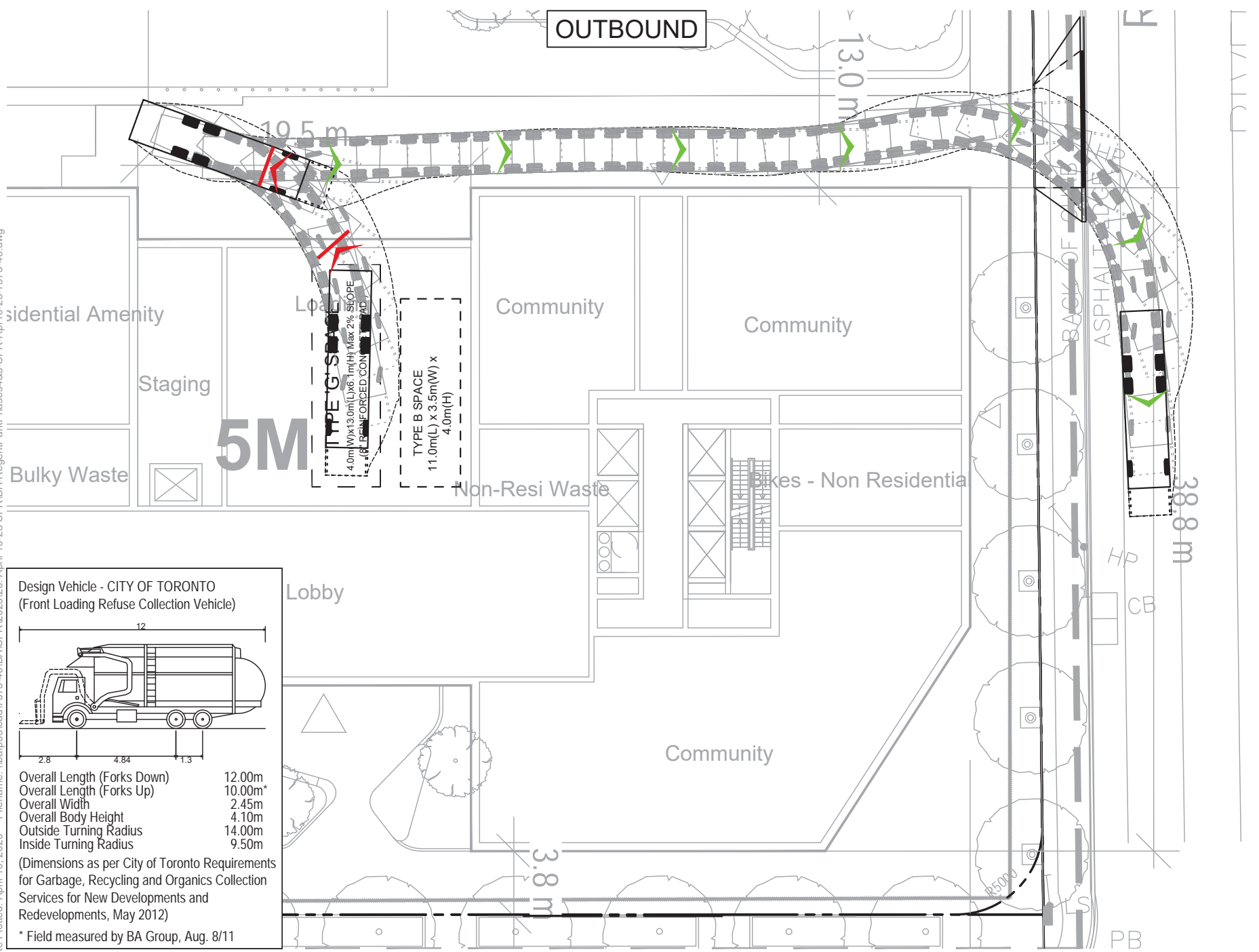
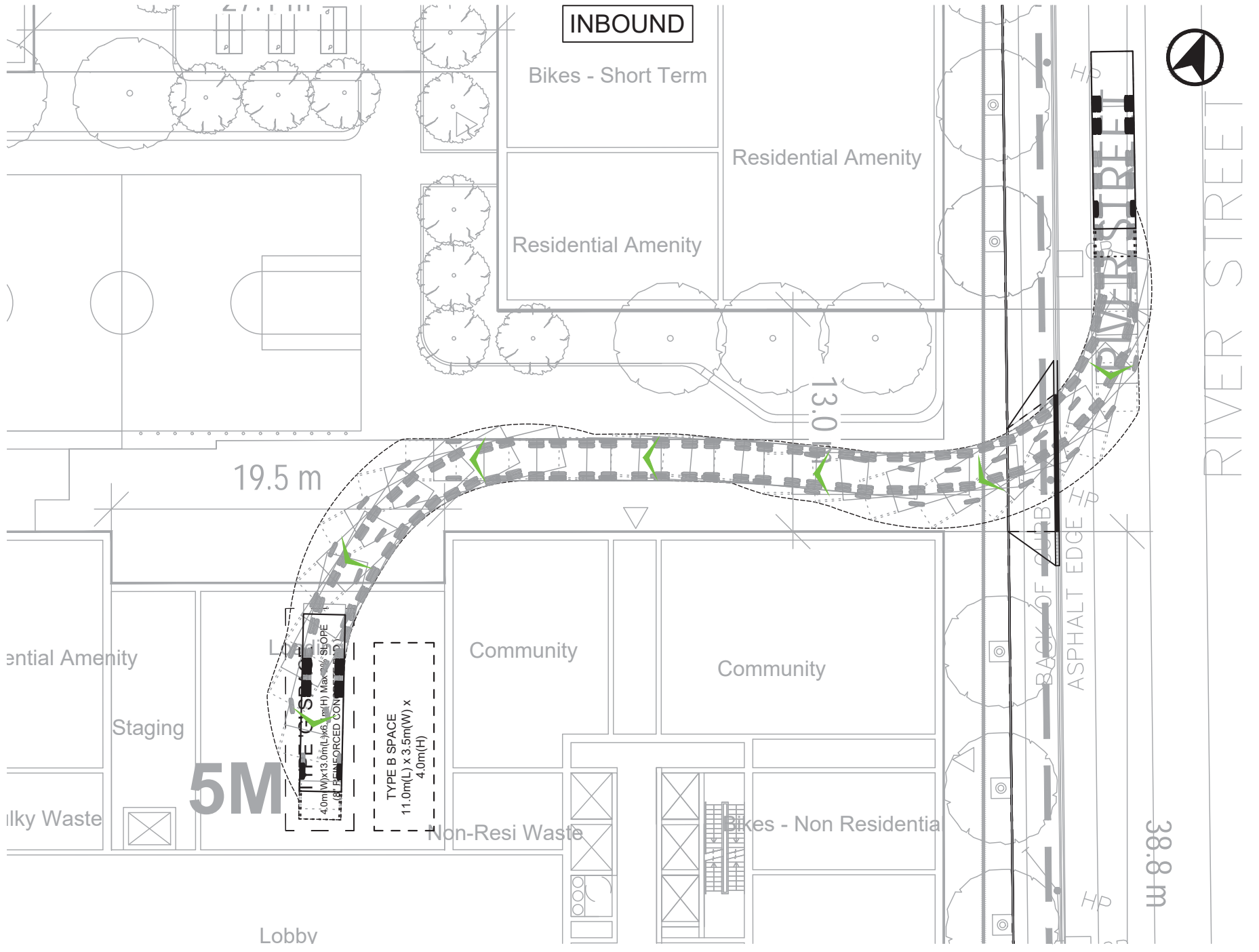


**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Buildings 4J & 4K  
 TAC Heavy Single Unit (HSU) Truck

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-06C**



Date Plotted: April 10, 2023 File name: \\baip03\cad\17575-46\BANS\PR\2023\20 - April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg

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(Front Loading Refuse Collection Vehicle)

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(Dimensions as per City of Toronto Requirements for Garbage, Recycling and Organics Collection Services for New Developments and Redevelopments, May 2012)  
\* Field measured by BA Group, Aug. 8/11

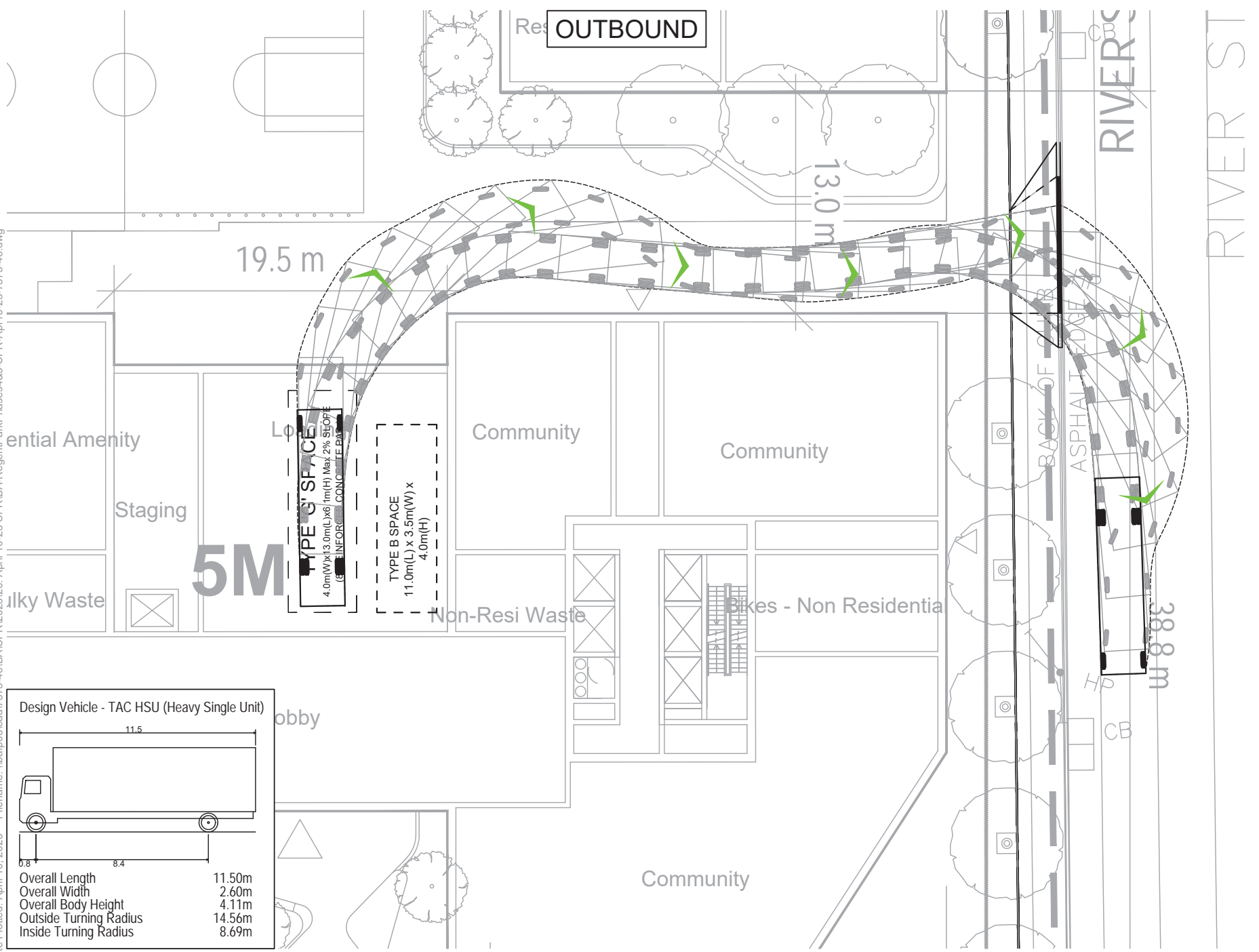


**REGENT PARK PHASES 4 & 5**  
VEHICULAR MANOEUVRING DIAGRAM  
Buildings 5L & 5M  
City of Toronto Front Loading Garbage Truck

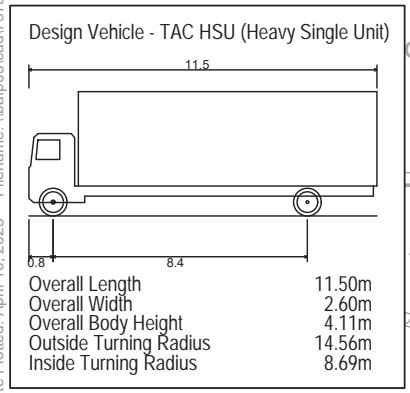
Project: Regent Park Phases 4 & 5  
Project No. 7575-46  
Date: November 29, 2022  
Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-07A**



Date Plotted: April 10, 2023 File name: \\baip03\cad\17575-46\BANS\PR\2023\20\_April 10-23 SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-7575-46.dwg



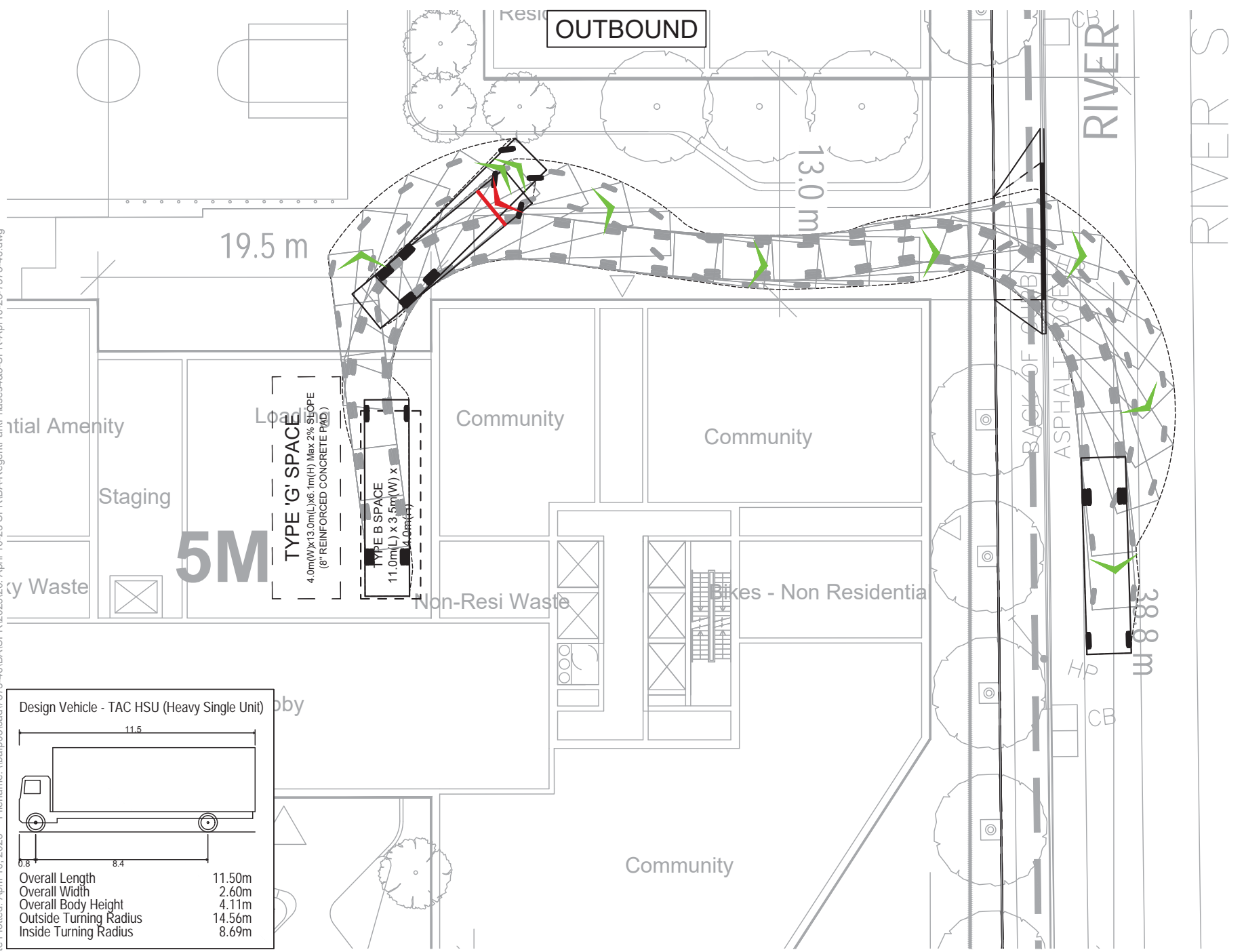
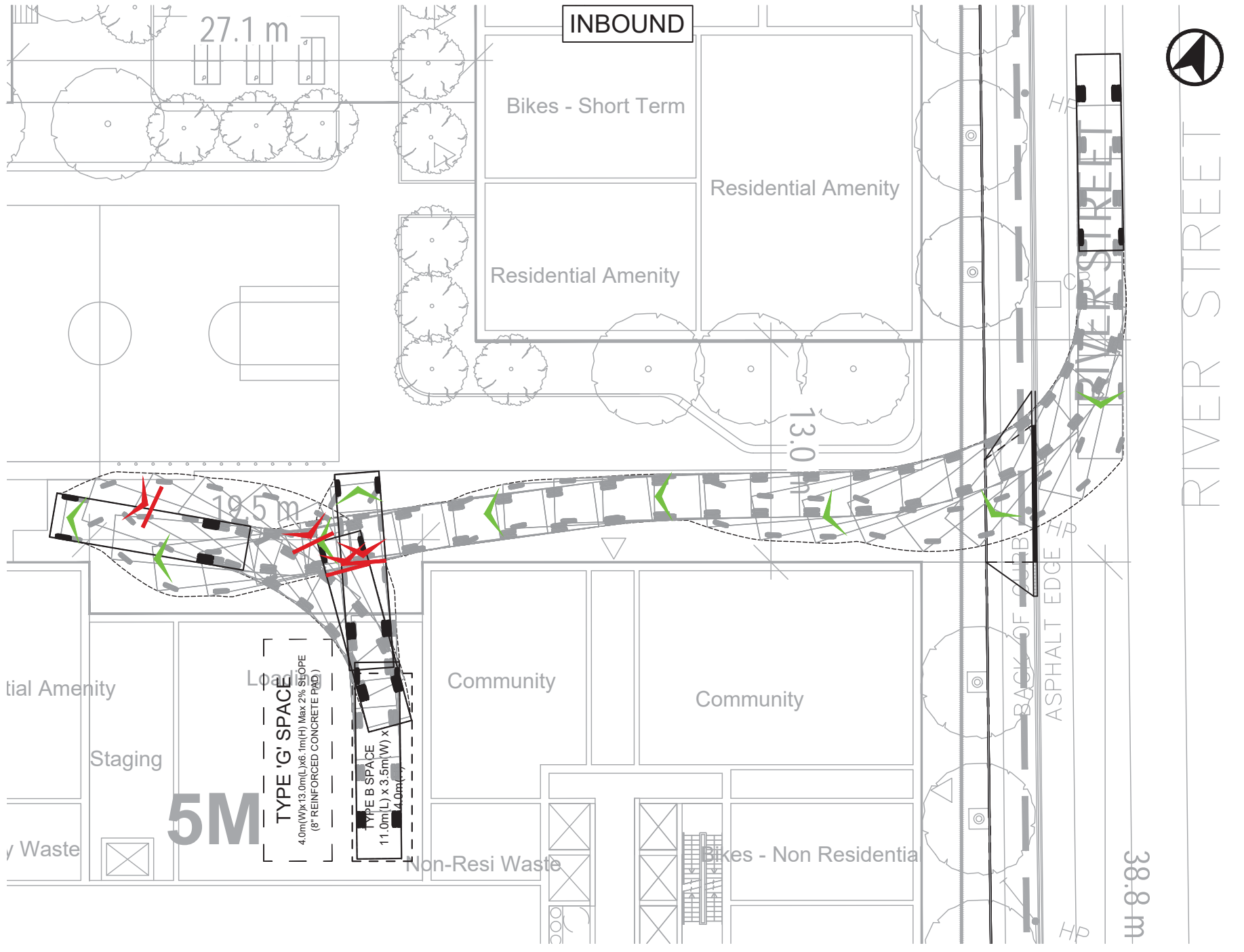
**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Buildings 5L & 5M  
 TAC Heavy Single Unit (HSU) Truck

Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

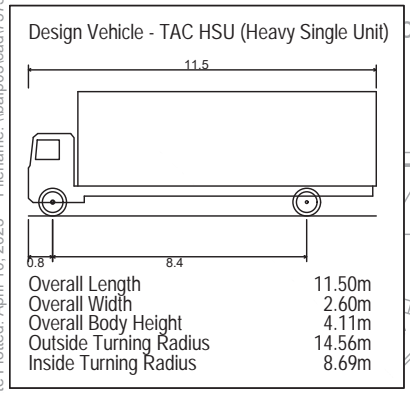
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Drawing No. **VMD-07B**





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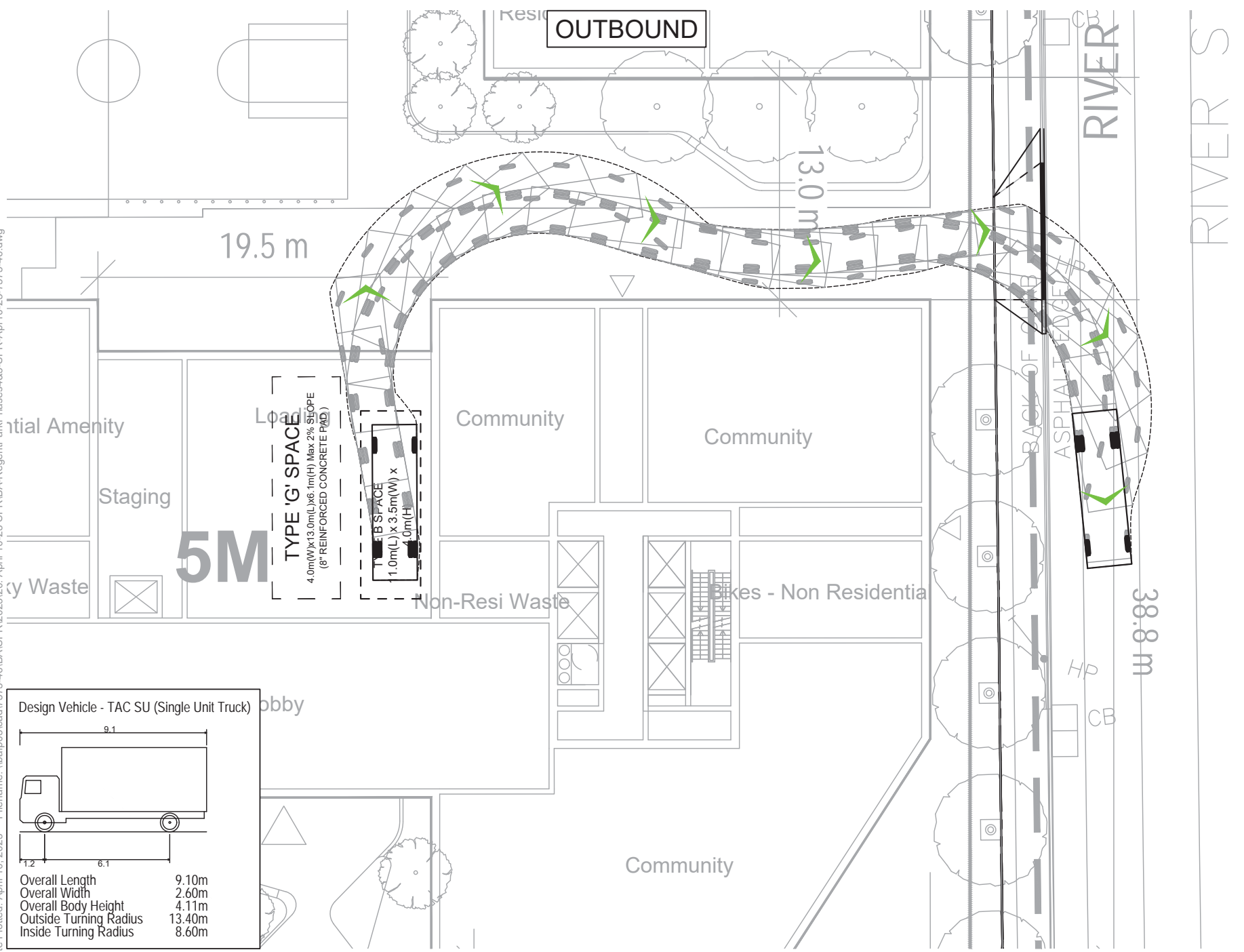
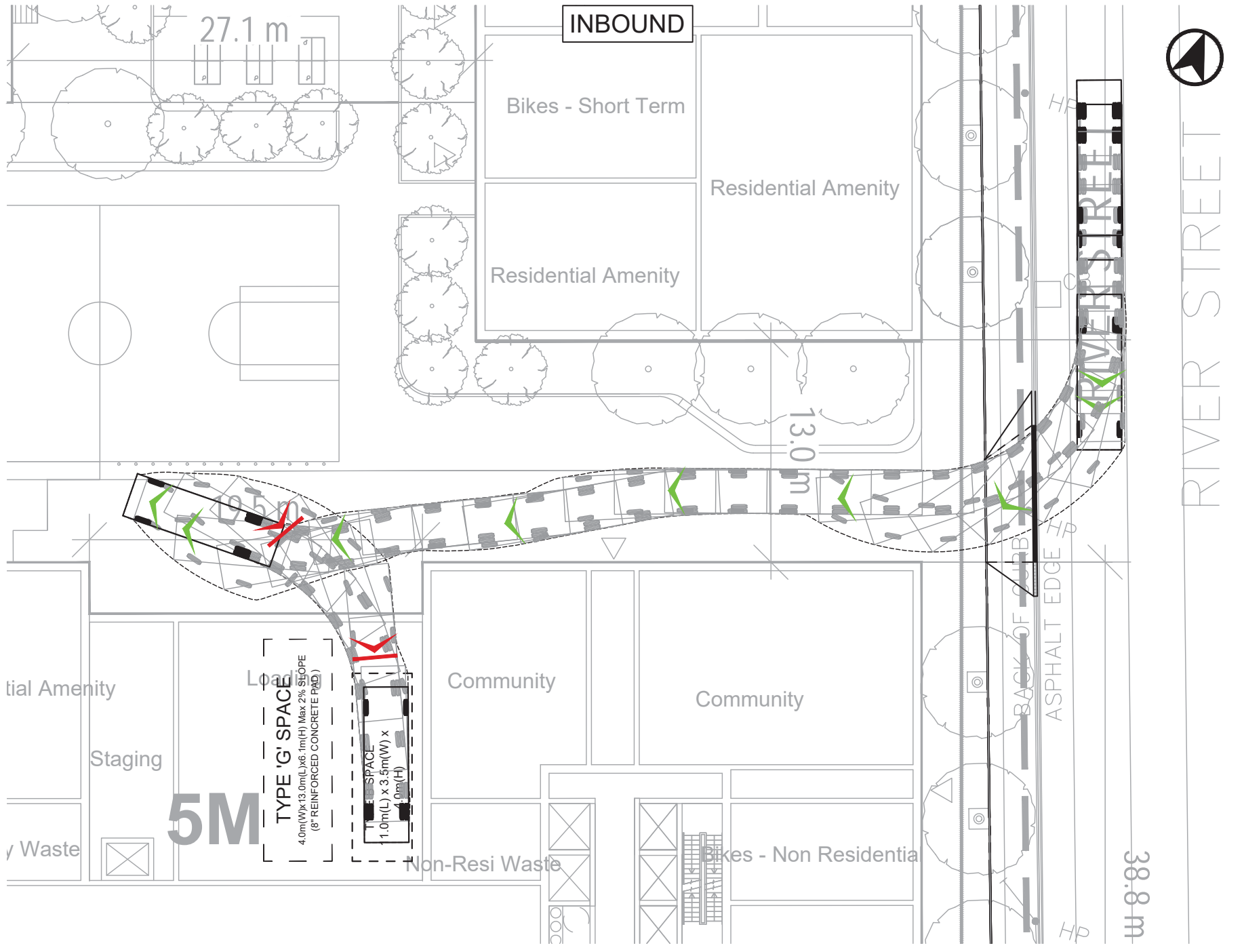


**REGENT PARK PHASES 4 & 5**  
**VEHICULAR MANOEUVRING DIAGRAM**  
 Buildings 5L & 5M  
 TAC Heavy Single Unit (HSU) Truck

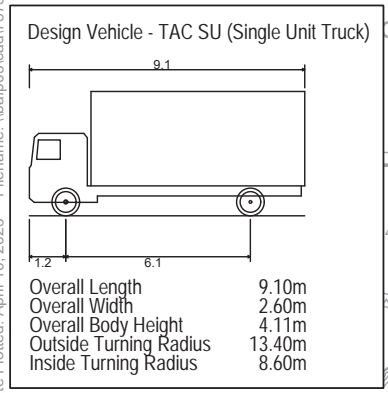
Project: Regent Park Phases 4 & 5  
 Project No. 7575-46  
 Date: November 29, 2022  
 Revised: April 10, 2023

Scale: 1:300

Drawing No. **VMD-07C**



Date Plotted: April 10, 2023 File: \\baip03\cad\17575-46\BANS\PR\2023\20\_April 10-23\_SPR\BA-RegentPark\Phases4&5-SPR-Apr10-23-17575-46.dwg



	<b>REGENT PARK PHASES 4 &amp; 5</b> VEHICULAR MANOEUVRING DIAGRAM Buildings 5L & 5M TAC Single Unit (SU) Truck	Project: Regent Park Phases 4 & 5 Project No. 7575-46 Date: November 29, 2022 Revised: April 10, 2023	Scale: 1:300 
		Drawing No. <b>VMD-07D</b>	

## Appendix F: Updated Lane Configuration and Traffic Volume Figures



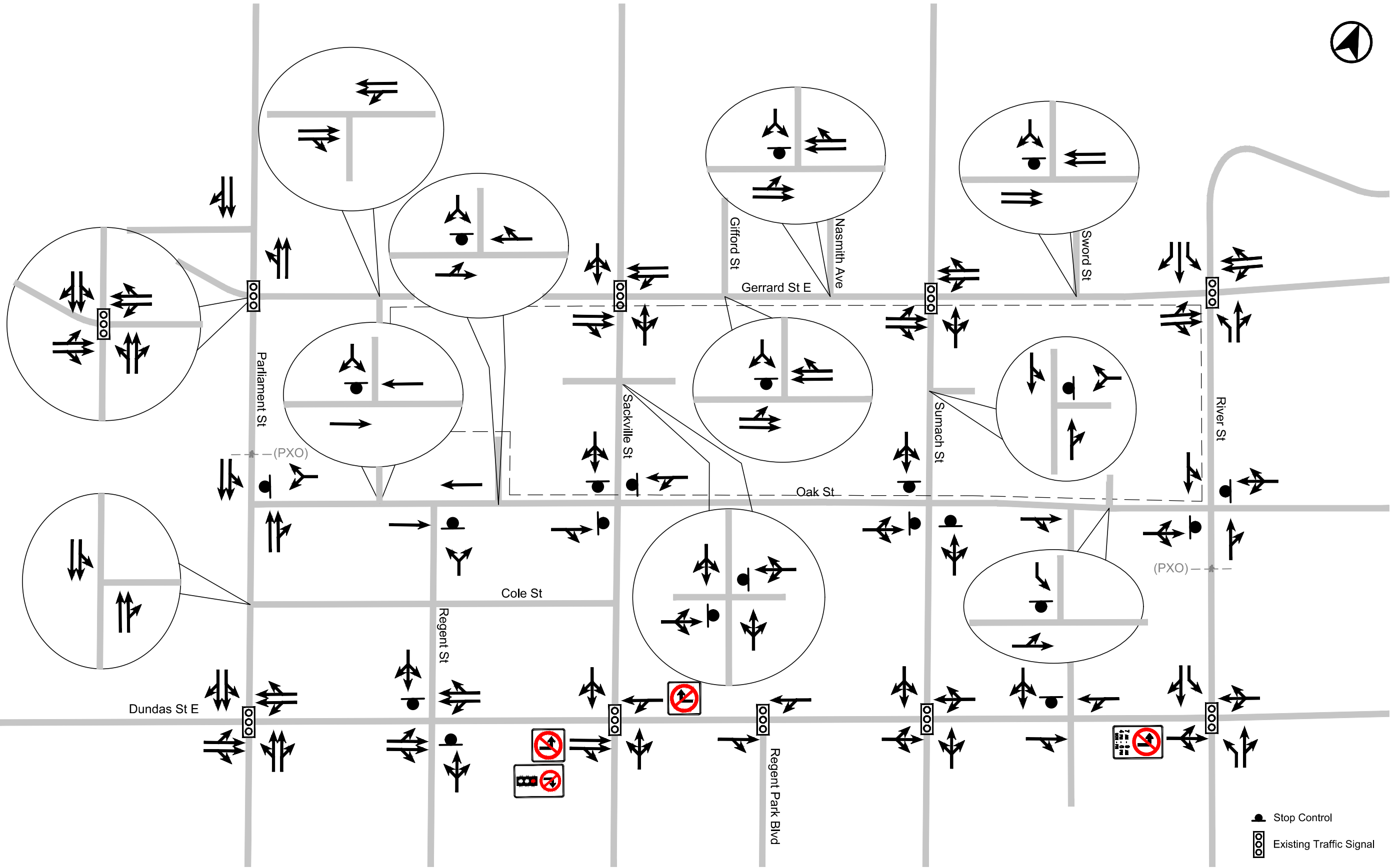


FIGURE 1 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

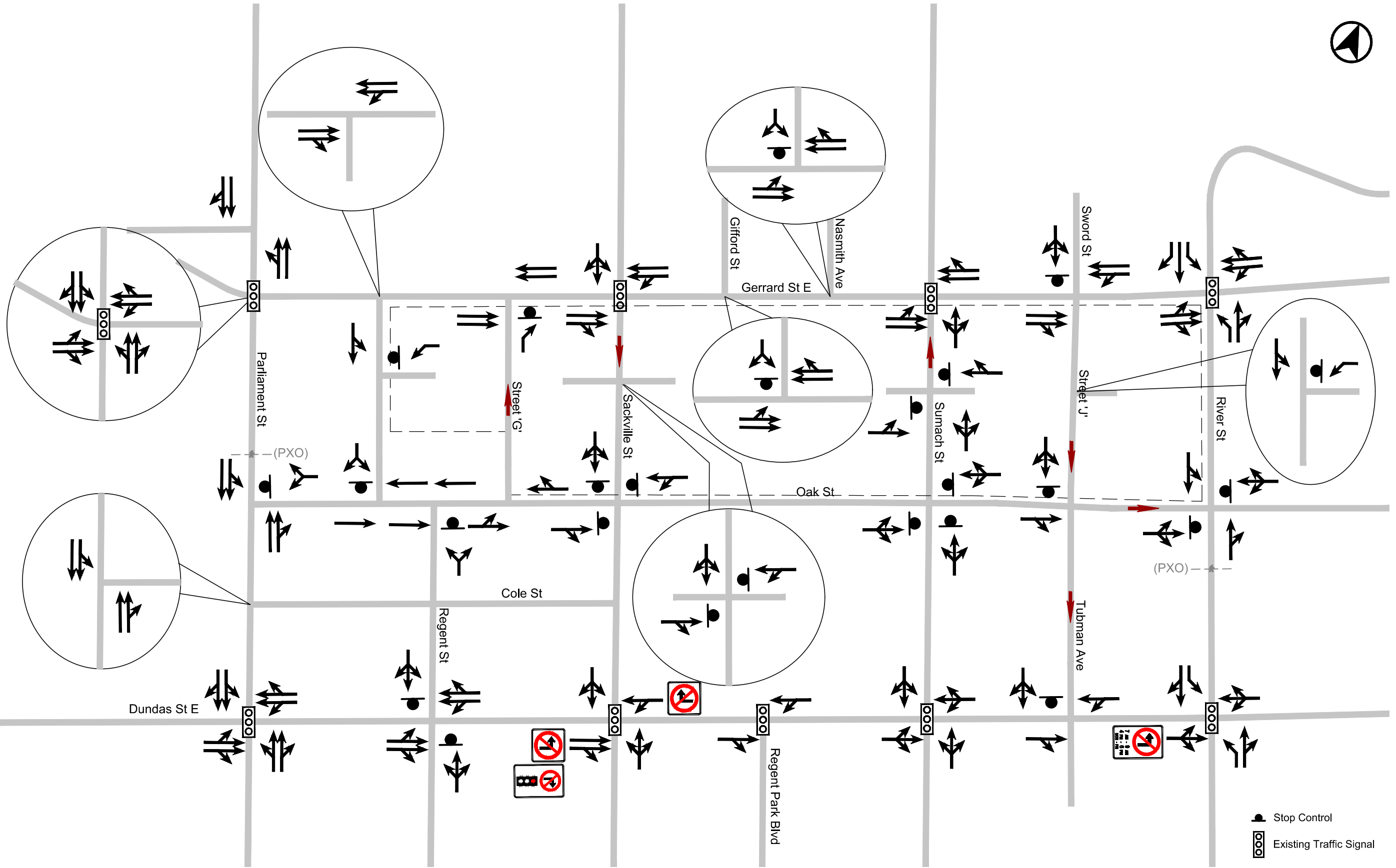


FIGURE 2 PROPOSED LANE CONFIGURATION AND TRAFFIC CONTROL  
(Sensitivity Road Network)  
REGENT PARK PHASES 4 & 5



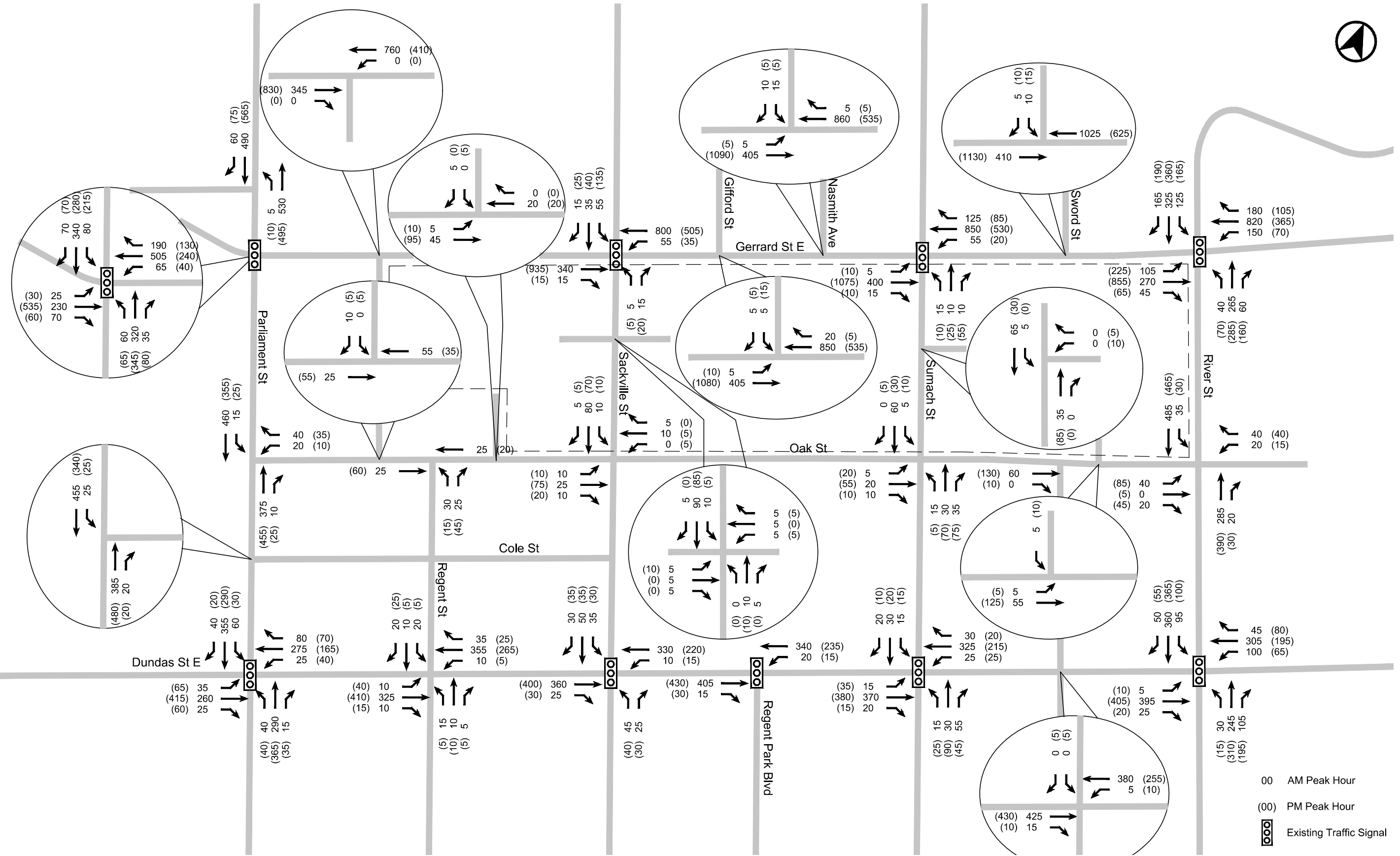
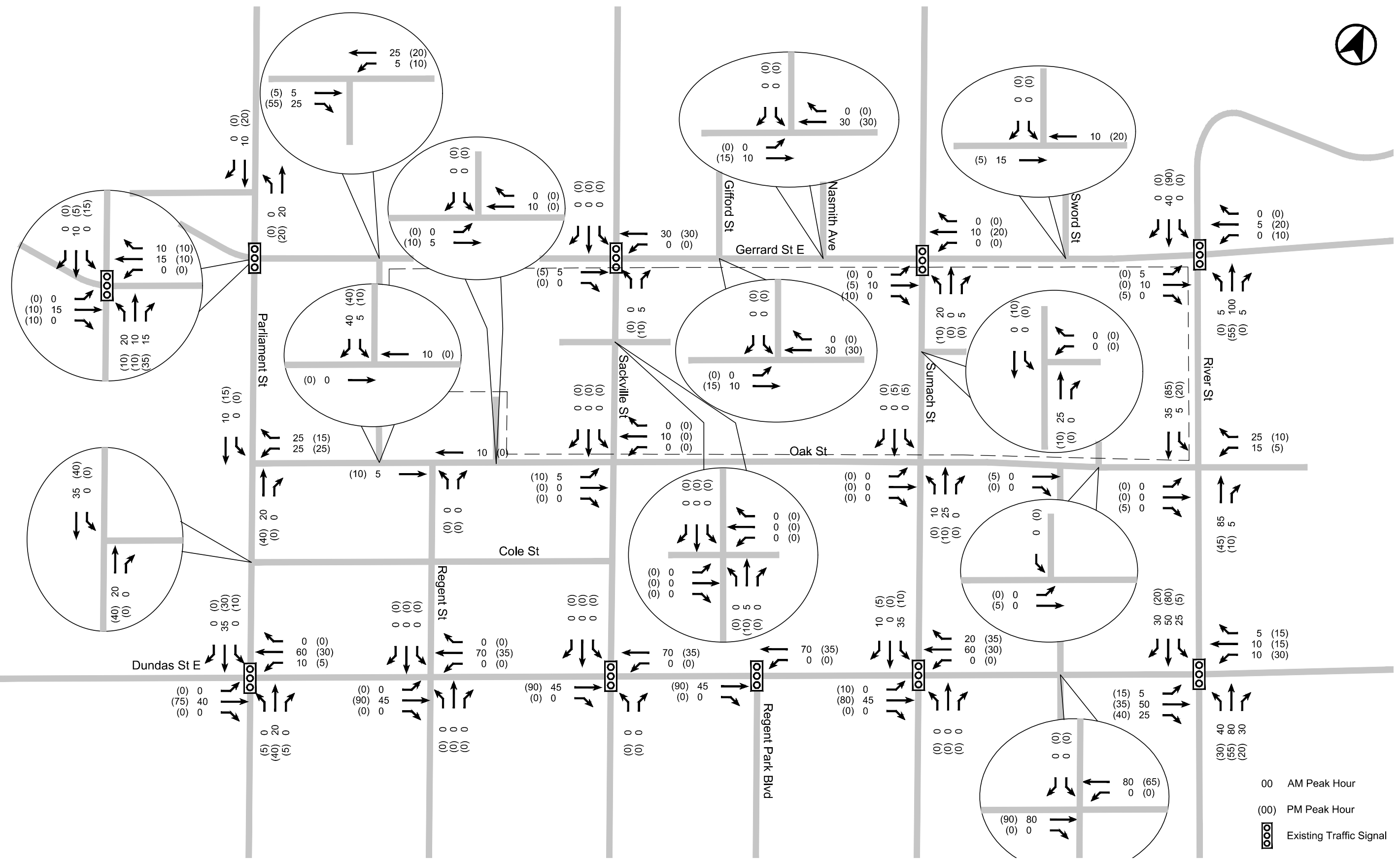


FIGURE 3 BASELINE EXISTING TRAFFIC VOLUMES



Date Plotted: April 5, 2023 Filename: P:\17517546\Graphics\CAD\Fig04-00-BD.dwg




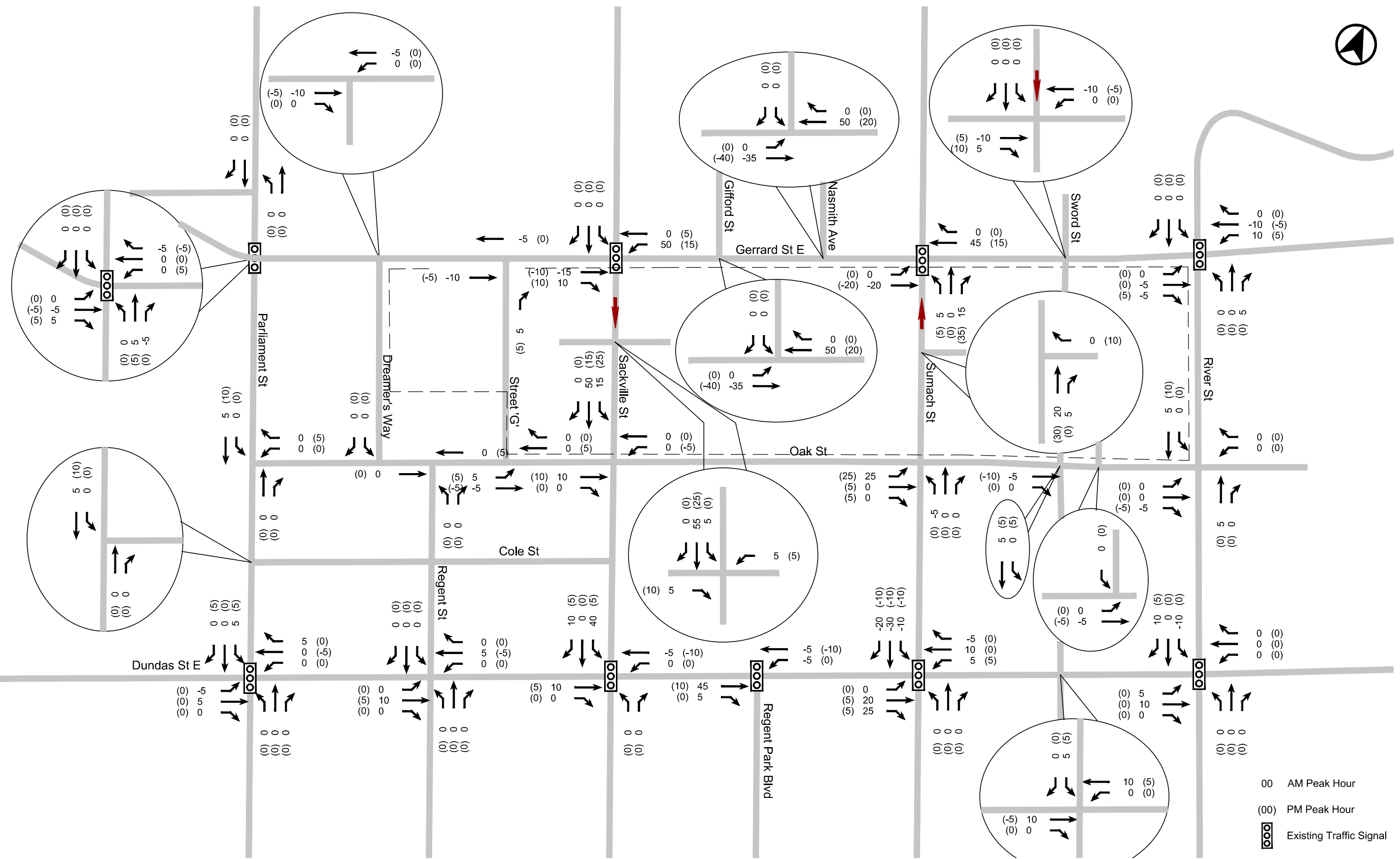
- 00 AM Peak Hour
- (00) PM Peak Hour
-  Existing Traffic Signal

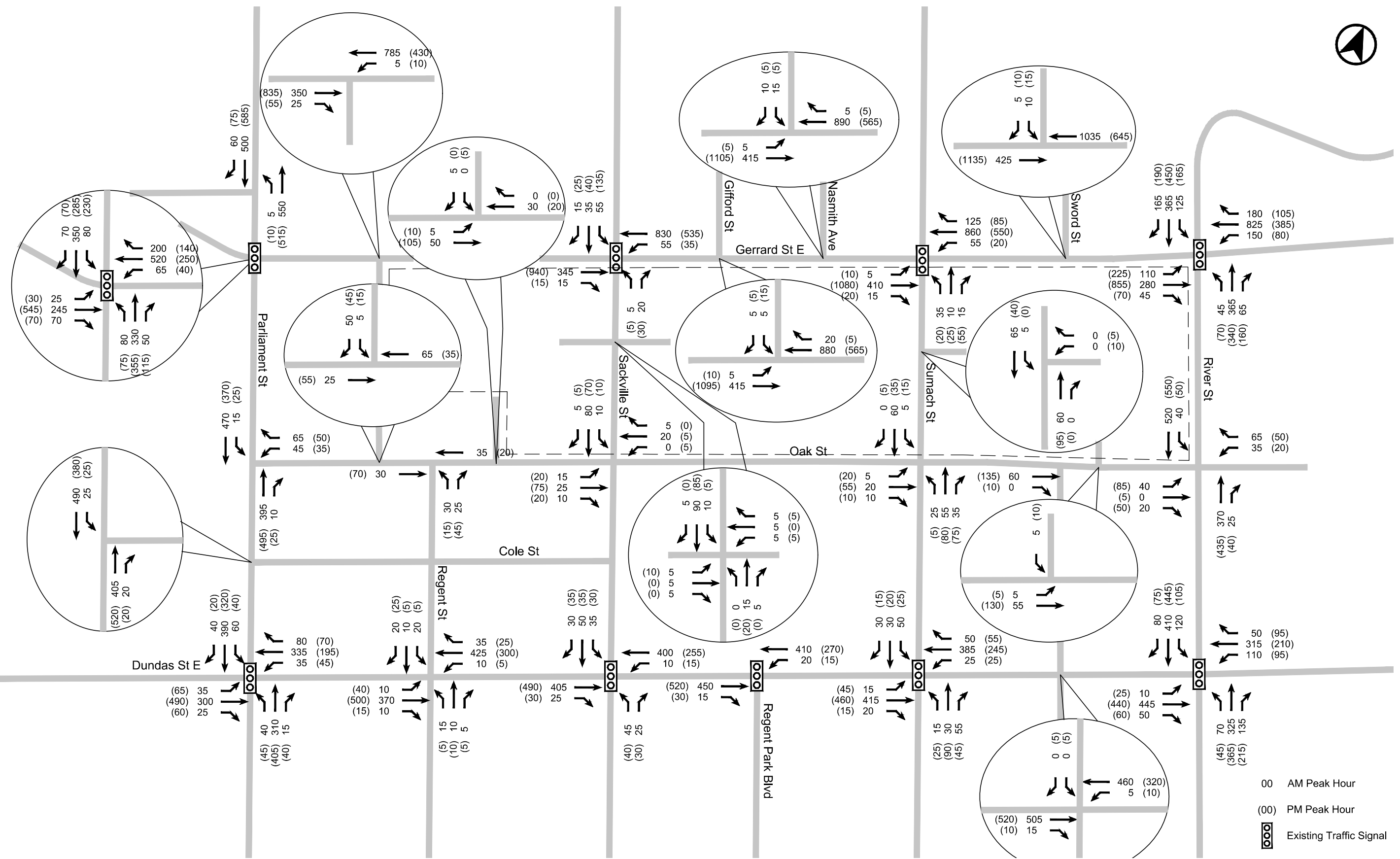
FIGURE 4 BACKGROUND DEVELOPMENT TRAFFIC ALLOWANCES



- 00 AM Peak Hour
- (00) PM Peak Hour
- Existing Traffic Signal

**FIGURE 5 PROPOSED ROAD NETWORK TRAFFIC VOLUME ADJUSTMENTS**  
 (BASE PROPOSED ROAD NETWORK)  
 REGENT PARK PHASES 4 & 5

Date Plotted: April 5, 2023 Filename: P:\17517546\Graphics\CAD\Fig06-00-2032FbT\_ERN.dwg



**FIGURE 6 2032 FUTURE BACKGROUND TRAFFIC VOLUMES**  
 (EXISTING ROAD NETWORK)





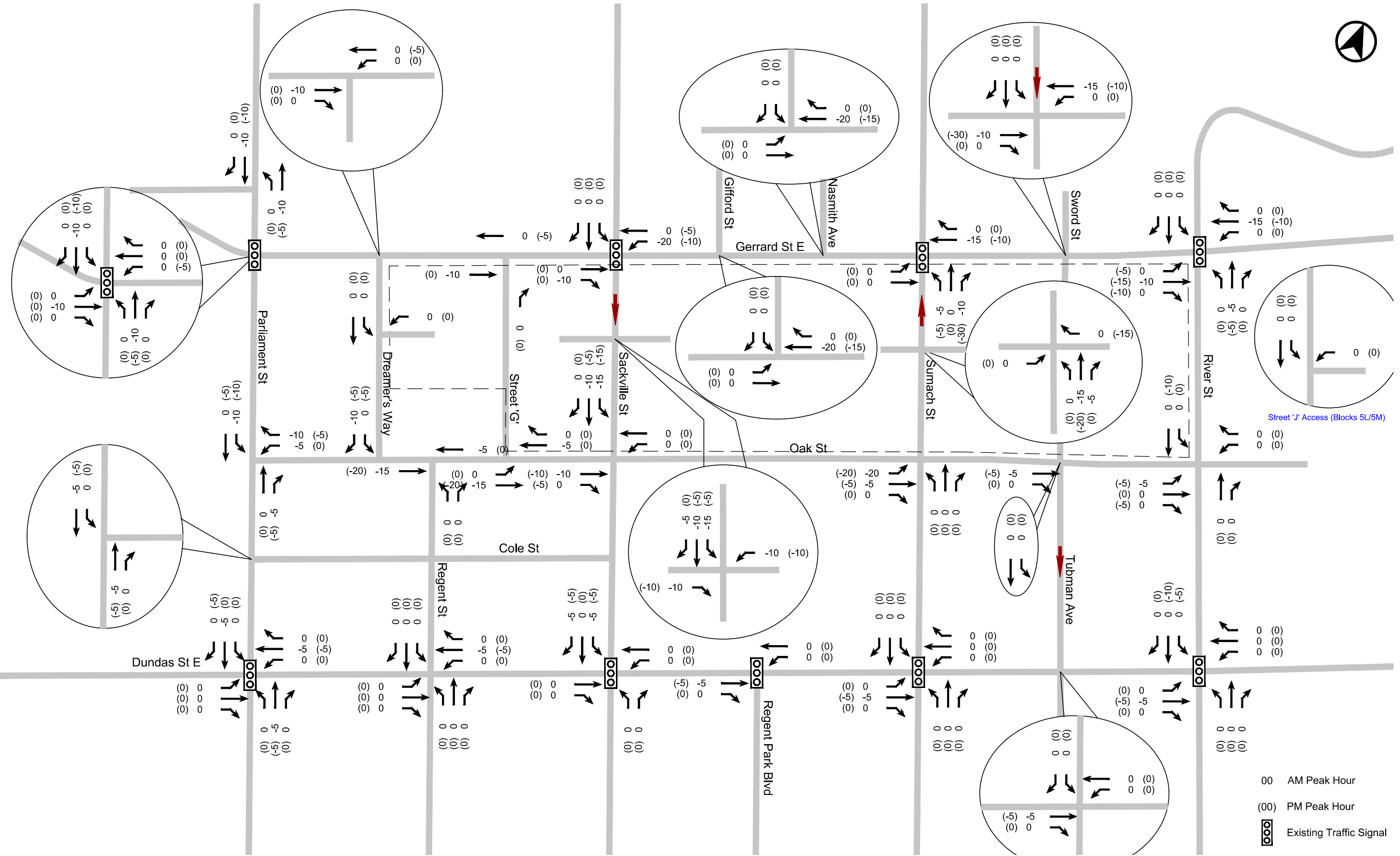
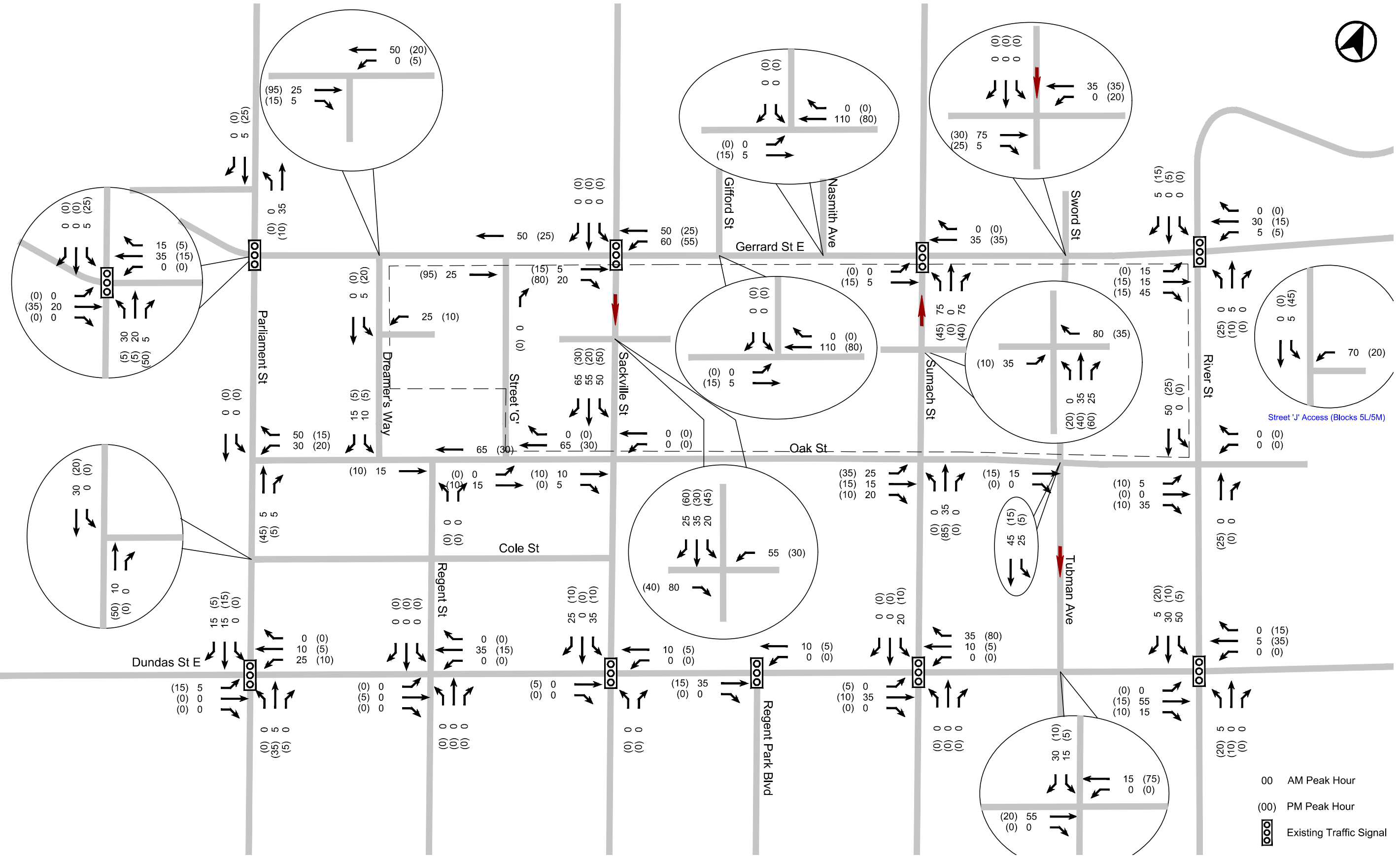
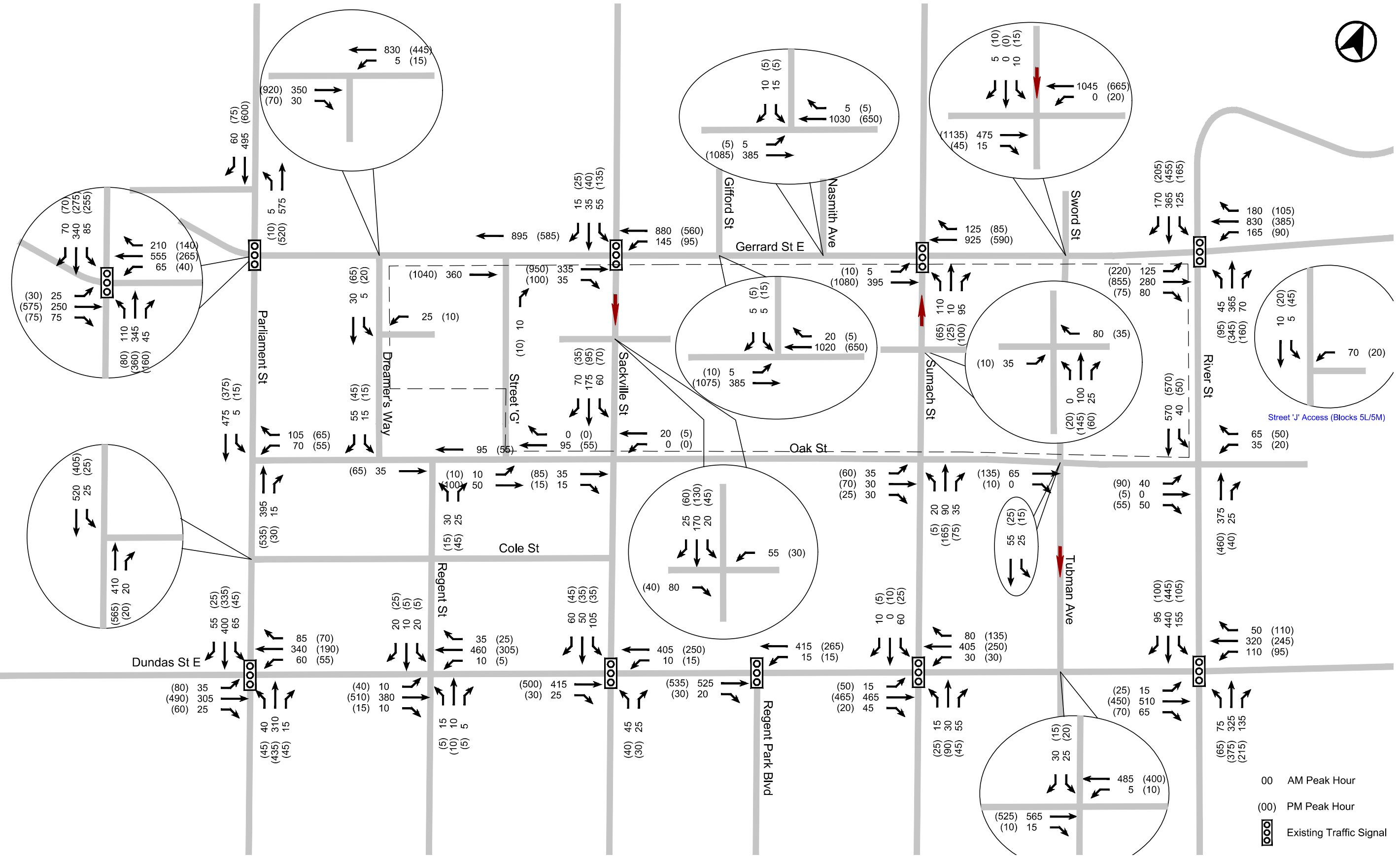


FIGURE 8 EXISTING SITE TRAFFIC VOLUMES (TO BE REMOVED)

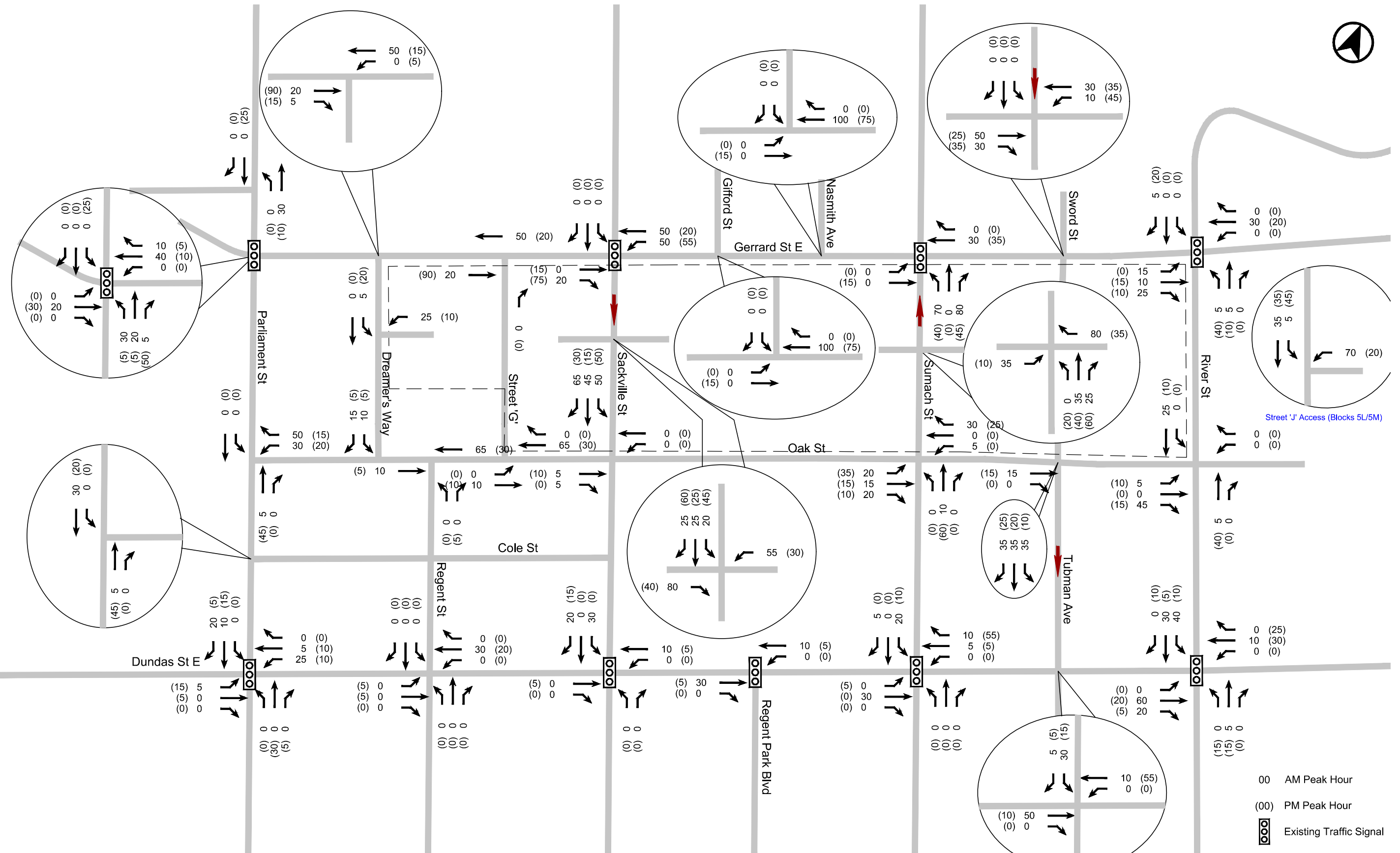


**FIGURE 9 TOTAL SITE TRAFFIC VOLUMES**  
 (BASE PROPOSED ROAD NETWORK)  
 REGENT PARK PHASES 4 & 5



00 AM Peak Hour  
 (00) PM Peak Hour  
 Existing Traffic Signal

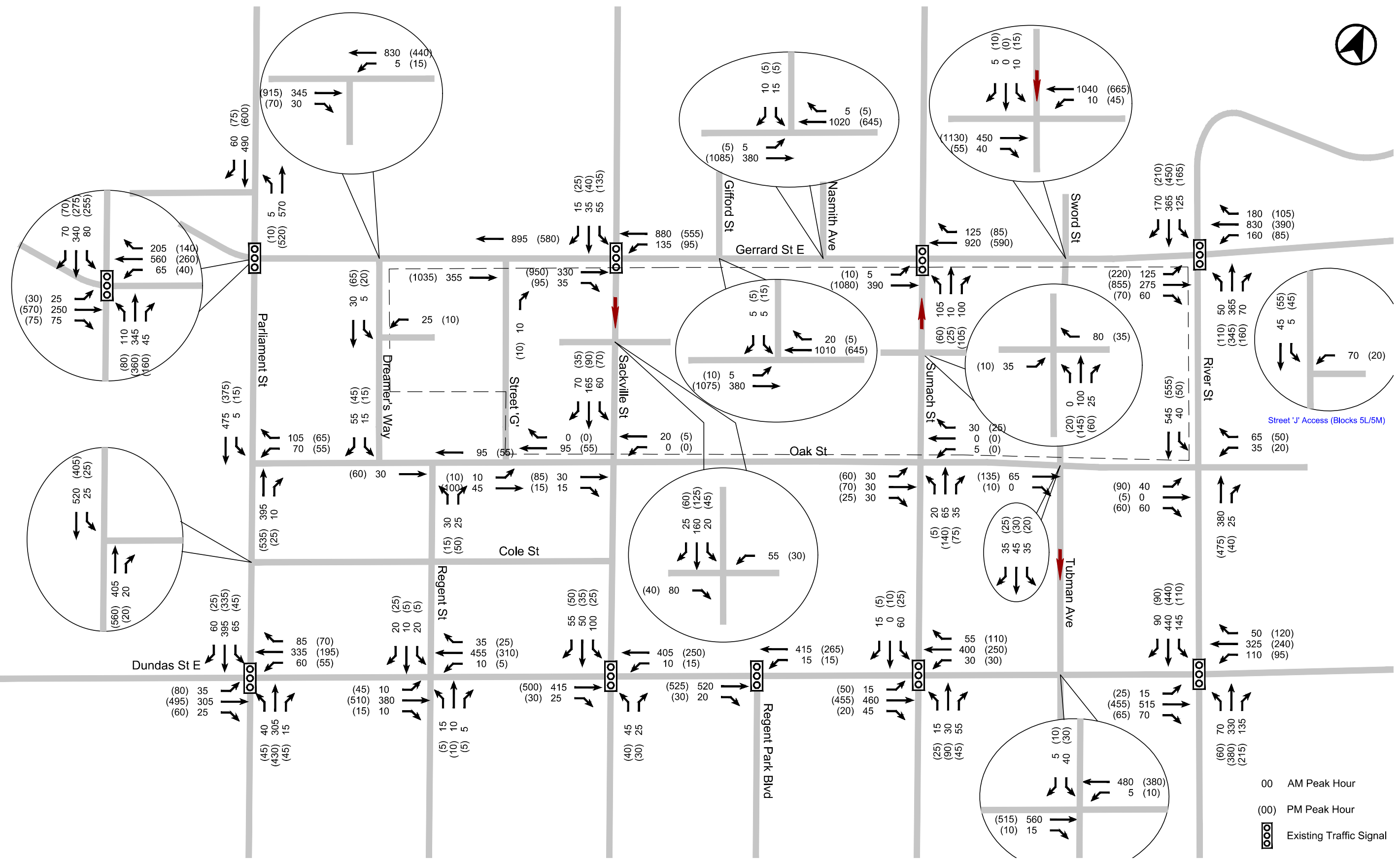
**FIGURE 10 2032 FUTURE TOTAL TRAFFIC VOLUMES**  
 (BASE PROPOSED ROAD NETWORK)  
 REGENT PARK PHASES 4 & 5



**FIGURE 11 TOTAL SITE TRAFFIC VOLUMES**  
(SENSITIVITY ROAD NETWORK)



Date Plotted: April 5, 2023 Filename: P:\17517546\Graphics\CAD\Fig12-00-2032FTT\_FRN-SENS.dwg



**FIGURE 12 2032 FUTURE TOTAL TRAFFIC VOLUMES**  
 (SENSITIVITY ROAD NETWORK)

REGENT PARK PHASES 4 & 5

## Appendix G: Updated Synchro Worksheets





Timings  
2: Parliament Street & Gerrard Street E

Queues  
2: Parliament Street & Gerrard Street E

Existing AM Model  
03-22-2023

Existing AM Model  
03-22-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	19.0	19.0	17.0	17.0
Total Split (s)	19.0	19.0	17.0	17.0
Total Split (%)	16%	16%	15%	15%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

	EBT	WBT	NBT	SBT
Lane Group	342	800	437	516
Lane Group Flow (vph)	0.33	0.78	0.53	0.36
v/c Ratio	20.6	31.2	27.7	13.3
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	20.6	31.2	27.7	13.3
Total Delay	17.2	52.2	28.8	20.9
Queue Length 50th (m)	36.2	98.3	53.7	43.1
Queue Length 95th (m)	33.0	63.9	119.2	15.0
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1058	1082	839	1459
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	0.32	0.74	0.52	0.35
Intersection Summary				



2. Parliament Street & Gerrard Street E

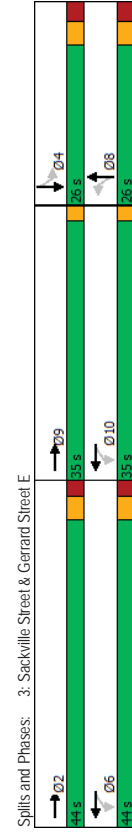
Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB
Traffic Volume (vph)	25	230	70	65	505	190	60	320	35	80	340	70
Future Volume (vph)	25	230	70	65	505	190	60	320	35	80	340	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Lane Util. 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
Fpb, ped/bikes	0.98	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Frt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd Flow (prot)	3310	3202	3198	3198	3198	3198	3198	3198	3198	3198	3197	3197
FIL Permitted	0.86	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.82	0.82
Sat'd Flow (perm)	2867	2827	2827	2827	2827	2827	2827	2827	2827	2827	2627	2627
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	242	74	68	532	200	63	337	37	84	358	74
RTOR Reduction (vph)	0	21	0	0	27	0	0	5	0	0	13	0
Lane Group Flow (vph)	0	321	0	0	773	0	0	432	0	0	503	0
Conf. Peds. (#/hr)	80	85	85	80	85	80	85	120	120	120	85	85
Conf. Bikes (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9	1 16 10
Permitted Phases	4 11	8 12	8 12	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9	6 10
Actuated Green, G (s)	37.2	37.2	37.2	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3	53.6
Effective Green, g (s)	38.2	38.2	38.2	41.3	41.3	41.3	41.3	41.3	41.3	41.3	41.3	44.4
Actuated g/C Ratio	0.40	0.40	0.40	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.47
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1155	1139	1139	1090	1090	1090	1090	1090	1090	1090	1277	1277
v/s Ratio Prot												c0.03
v/s Ratio Perm	0.11	c0.27	c0.27	60.17	60.17	60.17	60.17	60.17	60.17	60.17	0.15	0.15
v/c Ratio	0.28	0.68	0.68	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.39	0.39
Uniform Delay, d1	19.0	23.3	23.3	18.2	18.2	18.2	18.2	18.2	18.2	18.2	16.4	16.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.6	1.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	19.2	24.9	24.9	18.5	18.5	18.5	18.5	18.5	18.5	18.5	16.6	16.6
Level of Service	B	C	C	B	B	B	B	B	B	B	B	B
Approach Delay (s)	19.2	24.9	24.9	18.5	18.5	18.5	18.5	18.5	18.5	18.5	16.6	16.6
Approach LOS	B	C	C	B	B	B	B	B	B	B	B	B
Intersection Summary												
HCM 2000 Control Delay	20.6 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.62											
Actuated Cycle Length (s)	94.8 Sum of lost time (s) 22.5											
Intersection Capacity Utilization	98.8% ICU Level of Service F											
Analysis Period (min)	15											
c Critical Lane Group												

3. Sackville Street & Gerrard Street E

Existing AM Model  
03-22-2023

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø6	Ø2	Ø9	Ø10	
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB					
Traffic Volume (vph)	340	55	800	5	0	55	35					
Future Volume (vph)	340	55	800	5	0	55	35					
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA					
Protected Phases	2 9	6 10	6 10	8	4	2	6					
Permitted Phases	2 9	6 10	6 10	8	4	2	6					
Detector Phase	2	6	6	8	8	4	4					
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	16.0	16.0					
Minimum Split (s)	25.7	25.7	25.7	21.0	21.0	21.0	21.0					
Total Split (%)	26.0	26.0	26.0	26.0	26.0	44.0	44.0					
Total Split (s)	24.8%	24.8%	24.8%	24.8%	24.8%	42%	42%					
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0					
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.0	2.0					
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	0.0					
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7					
Lead-Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effect Green (s)	43.6	43.6	43.6	23.0	23.0	23.0	23.0					
Actuated g/C Ratio	0.57	0.57	0.57	0.30	0.30	0.30	0.30					
v/c Ratio	0.21	0.54	0.54	0.05	0.05	0.28	0.28					
Control Delay	6.5	9.7	9.7	4.2	4.2	29.6	29.6					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	6.5	9.7	9.7	4.2	4.2	29.6	29.6					
LOS	A	A	A	A	A	C	C					
Approach Delay	6.5	9.7	9.7	4.2	4.2	29.6	29.6					
Approach LOS	A	A	A	A	A	C	C					
Intersection Summary												
Cycle Length: 105												
Actuated Cycle Length: 76.1												
Natural Cycle: 85												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.54												
Intersection Signal Delay: 10.3	Intersection LOS: B											
Intersection Capacity Utilization 64.3%	ICU Level of Service C											
Analysis Period (min) 15												



Existing AM Model  
03-22-2023

HCM Signalized Intersection Capacity Analysis  
3. Sackville Street & Gerrard Street E

Existing AM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	390	939	21	114
Lane Group Flow (vph)	0.21	0.54	0.05	0.28
v/c Ratio	6.5	9.7	4.2	29.6
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	6.5	9.7	4.2	29.6
Total Delay	11.3	35.7	0.0	15.3
Queue Length 50th (m)	16.2	46.6	2.7	33.6
Queue Length 95th (m)	139.8	47.8	34.3	15.3
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2331	2221	427	412
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.42	0.05	0.28
<b>Intersection Summary</b>				

	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Configurations	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑	4↑
Traffic Volume (vph)	0	340	15	55	800	0	5	0	15
Future Volume (vph)	0	340	15	55	800	0	5	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.5	3.0	3.0	3.5	3.0	3.5
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frbp. ped/bikes	0.99	0.99	1.00	1.00	0.87	0.87	0.99	0.99	0.99
Frbp. ped/bikes	1.00	0.99	1.00	0.99	0.99	0.99	0.92	0.92	0.92
Frt	0.99	0.99	1.00	1.00	0.90	0.90	0.98	0.98	0.97
Frt Protected	1.00	1.00	1.00	1.00	0.99	0.99	0.97	0.97	0.97
Satd. Flow (prot)	3215	3215	3393	3393	1432	1432	1685	1685	1685
Flt Permitted	1.00	1.00	0.90	0.90	0.95	0.95	0.85	0.85	0.85
Satd. Flow (perm)	3215	3215	3066	3066	1376	1376	1382	1382	1382
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	374	16	60	879	0	5	0	16
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	4
Lane Group Flow (vph)	0	386	0	0	939	0	6	0	109
Confl. Peds. (#/hr)	40	60	60	60	40	60	140	140	60
Confl. Bikes (#/hr)	15	15	15	15	75	75	140	140	15
Heavy Vehicles (%)	0%	10%	0%	9%	4%	0%	0%	0%	6%
Turn Type	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2.9	6.10	6.10	6.10	8	8	4	4	4
Permitted Phases	2.9	6.10	6.10	6.10	8	8	4	4	4
Actuated Green, G (s)	46.8	46.8	46.8	46.8	21.9	21.9	21.9	21.9	21.9
Effective Green, g (s)	47.8	47.8	47.8	47.8	22.9	22.9	22.9	22.9	22.9
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)					5.7	5.7	5.7	5.7	5.7
Vehicle Extension (s)					3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2011	2011	1918	1918	412	412	414	414	414
v/s Ratio Prot	0.12	0.12	0.12	0.12	0.00	0.00	0.08	0.08	0.08
v/s Ratio Perm	0.19	0.19	0.49	0.49	0.02	0.02	0.26	0.26	0.26
Uniform Delay, d1	6.1	6.1	7.7	7.7	18.8	18.8	20.3	20.3	20.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.0	0.2	0.2	0.0	0.0	0.3	0.3	0.3
Delay (s)	6.1	6.1	7.9	7.9	18.8	18.8	20.7	20.7	20.7
Level of Service	A	A	A	A	B	B	C	C	C
Approach Delay (s)	6.1	6.1	7.9	7.9	18.8	18.8	20.7	20.7	20.7
Approach LOS	A	A	A	A	B	B	C	C	C
<b>Intersection Summary</b>									
HCM 2000 Control Delay	8.6		HCM 2000 Level of Service		A				
HCM 2000 Volume to Capacity ratio	0.43								
Actuated Cycle Length (s)	76.4		Sum of lost time (s)		9.7				
Intersection Capacity Utilization	64.3%		ICU Level of Service		C				
Analysis Period (min)	15								
c Critical Lane Group									

HCM Unsignalized Intersection Capacity Analysis  
 4: Gerrard Street E & Gifford Street

HCM Unsignalized Intersection Capacity Analysis  
 5: Gerrard Street E & Nasmith Avenue

Existing AM Model  
 03-22-2023

Existing AM Model  
 03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		←↑	←↑		←↑	←↑
Traffic Volume (veh/h)	5	405	850	20	5	5
Future Volume (Veh/h)	5	405	850	20	5	5
Sign Control		Free	Free	Free	Stop	Stop
Grade		0%	0%	0%	0%	0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	422	885	21	5	5
Pedestrians		5	5		50	
Lane Width (m)		3.5	3.5	3.0		
Walking Speed (m/s)		1.1	1.1	1.1		
Percent Blockage		0	0		4	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
PX platoon unblocked	0.93			0.94	0.93	
VC conflicting volume	956			1172	508	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	801			935	319	
IC single (s)	4.1			7.5	7.3	
IC 2 stage (s)						
IF (s)	2.2			3.8	3.5	
p0 queue free %	99			97	99	
CM capacity (veh/h)	743			192	558	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	146	281	590	316	10	
Volume Left	5	0	0	0	5	
Volume Right	0	0	0	21	5	
cSH	743	1700	1700	1700	285	
Volumes to Capacity	0.01	0.17	0.35	0.19	0.04	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.8	
Control Delay (s)	0.4	0.0	0.0	0.0	18.1	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		18.1	
Approach LOS					C	
Intersection Summary						
Average Delay				0.2		
Intersection Capacity Utilization				35.8%	ICU Level of Service	
Analysis Period (min)				15	A	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		←↑	←↑		←↑	←↑
Traffic Volume (veh/h)	5	405	860	5	15	10
Future Volume (Veh/h)	5	405	860	5	15	10
Sign Control		Free	Free	Free	Stop	Stop
Grade		0%	0%	0%	0%	0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	418	887	5	15	10
Pedestrians					75	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					6	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
PX platoon unblocked	0.90			0.90	0.90	
VC conflicting volume	967			1184	521	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	742			983	247	
IC single (s)	4.1			6.9	7.1	
IC 2 stage (s)						
IF (s)	2.2			3.6	3.4	
p0 queue free %	99			93	98	
CM capacity (veh/h)	742			200	619	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	144	279	591	301	25	
Volume Left	5	0	0	0	15	
Volume Right	0	0	0	5	10	
cSH	742	1700	1700	1700	275	
Volumes to Capacity	0.01	0.16	0.35	0.18	0.09	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.3	
Control Delay (s)	0.4	0.0	0.0	0.0	19.4	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		19.4	
Approach LOS					C	
Intersection Summary						
Average Delay				0.4		
Intersection Capacity Utilization				34.0%	ICU Level of Service	
Analysis Period (min)				15	A	

Timings Existing AM Model  
03-22-2023

Queues Existing AM Model  
03-22-2023

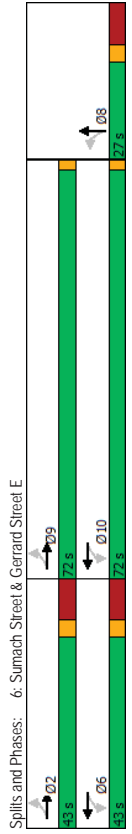
6: Summach Street & Gerrard Street E

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations									
Traffic Volume (vph)	5	400	55	850	10				
Future Volume (vph)	5	400	55	850	10				
Turn Type	Perm	NA	Perm	NA	NA				
Protected Phases	2,9		6,10	8	2	6	9	10	
Permitted Phases	2,9		6,10	8					
Detector Phase	2	2	6	6	8				
Switch Phase									
Minimum Initial (s)					15.0	11.0	11.0	5.0	5.0
Minimum Split (s)					25.4	26.2	26.2	72.0	72.0
Total Split (s)					27.0	43.0	43.0	72.0	72.0
Total Split (%)					19.0%	30%	30%	51%	51%
Yellow Time (s)					3.0	3.0	3.0	2.0	2.0
All-Red Time (s)					7.4	7.2	7.2	0.0	0.0
Lost Time Adjust (s)					-1.0				
Total Lost Time (s)					9.4				
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode					None	Min	Min	None	None
Act Effct Green (s)		72.1		72.1	19.4				
Actuated g/C Ratio		0.74		0.74	0.20				
v/c Ratio		0.21		0.56	0.13				
Control Delay		6.1		9.3	39.9				
Queue Delay		0.0		0.2	0.0				
Total Delay		6.1		9.4	39.9				
LOS		A		A	D				
Approach Delay		6.1		9.4	39.9				
Approach LOS		A		A	D				
Intersection Summary									
Cycle Length: 142									
Actuated Cycle Length: 98									
Natural Cycle: 125									
Control Type: Actuated-Uncoordinated									
Maximum v/c Ratio: 0.56									
Intersection Signal Delay: 9.2									
Intersection Capacity Utilization: 78.6%									
Analysis Period (min): 15									

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	483	1184	39
v/c Ratio	0.21	0.56	0.13
Control Delay	6.1	9.3	39.9
Queue Delay	0.0	0.2	0.0
Total Delay	6.1	9.4	39.9
Queue Length 50th (m)	17.8	62.4	3.7
Queue Length 95th (m)	22.2	71.8	17.8
Internal Link Dist (m)	44.0	75.7	33.2
Turn Bay Length (m)			
Base Capacity (vph)	2181	1990	326
Starvation Cap Reductn	0	181	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.65	0.12
Intersection Summary			

Lane Group	EBL	EBT	WBL	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations									
Traffic Volume (vph)	5	400	55	850	10				
Future Volume (vph)	5	400	55	850	10				
Turn Type	Perm	NA	Perm	NA	NA				
Protected Phases	2,9		6,10	8	2	6	9	10	
Permitted Phases	2,9		6,10	8					
Detector Phase	2	2	6	6	8				
Switch Phase									
Minimum Initial (s)					15.0	11.0	11.0	5.0	5.0
Minimum Split (s)					25.4	26.2	26.2	72.0	72.0
Total Split (s)					27.0	43.0	43.0	72.0	72.0
Total Split (%)					19.0%	30%	30%	51%	51%
Yellow Time (s)					3.0	3.0	3.0	2.0	2.0
All-Red Time (s)					7.4	7.2	7.2	0.0	0.0
Lost Time Adjust (s)					-1.0				
Total Lost Time (s)					9.4				
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode					None	Min	Min	None	None
Act Effct Green (s)		72.1		72.1	19.4				
Actuated g/C Ratio		0.74		0.74	0.20				
v/c Ratio		0.21		0.56	0.13				
Control Delay		6.1		9.3	39.9				
Queue Delay		0.0		0.2	0.0				
Total Delay		6.1		9.4	39.9				
LOS		A		A	D				
Approach Delay		6.1		9.4	39.9				
Approach LOS		A		A	D				
Intersection Summary									
Cycle Length: 142									
Actuated Cycle Length: 98									
Natural Cycle: 125									
Control Type: Actuated-Uncoordinated									
Maximum v/c Ratio: 0.56									
Intersection Signal Delay: 9.2									
Intersection Capacity Utilization: 78.6%									
Analysis Period (min): 15									





6: Sumach Street & Gerrard Street E Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4B					
Traffic Volume (vph)	5	400	15	55	850	125	15	10	10	0	0	0
Future Volume (vph)	5	400	15	55	850	125	15	10	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp. ped/bikes	0.99			0.97			0.96					
Frbp. ped/bikes	1.00			0.99			0.91					
Frt	0.99			0.98			0.96					
Flt Protected	1.00			1.00			0.98					
Sat'd. Flow (prot)	3852			3251			1548					
Flt Permitted	0.94			0.89			0.98					
Sat'd. Flow (perm)	3148			2887			1548					
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	460	17	63	977	144	17	11	11	0	0	0
RTOR Reduction (vph)	0	2	0	0	7	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	481	0	0	1177	0	0	29	0	0	0	0
Conf. Peds. (#/hr)	65	85	85	65	100	65	100	65	65	65	100	100
Conf. Bikes (#/hr)												
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	MA	Perm	MA	Perm	MA	Perm	MA	Perm	MA	Perm	MA
Protected Phases		2.9		6.10		6.10		8				
Permitted Phases		2.9		6.10		6.10		8				
Actuated Green, G (s)		76.5		76.5		76.5		11.2				
Effective Green, g (s)		77.5		77.5		77.5		12.2				
Actuated g/C Ratio		0.77		0.77		0.77		0.12				
Clearance Time (s)								10.4				
Vehicle Extension (s)								3.0				
Lane Grp Cap (vph)		2437		2235		2235		188				
v/s Ratio Prot		0.15		0.41		0.41		0.02				
v/s Ratio Perm		0.20		0.53		0.53		0.16				
v/c Ratio		3.0		4.3		4.3		39.3				
Uniform Delay, d1		1.00		1.00		1.00		1.00				
Progression Factor		0.0		0.2		0.4		0.4				
Incremental Delay, d2		3.1		4.5		39.7		39.7				
Delay (s)		A		A		D		D				
Level of Service		A		A		D		D				
Approach Delay (s)		3.1		4.5		39.7		39.7				0.0
Approach LOS		A		A		D		D				A
Intersection Summary												
HCM 2000 Control Delay	4.9 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	100.1 Sum of lost time (s)											
Intersection Capacity Utilization	78.6% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

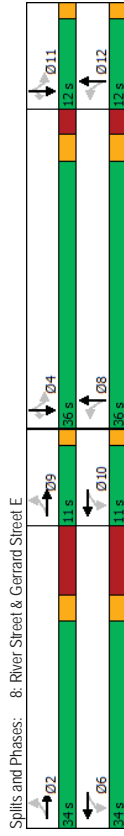
7: Gerrard Street E & Sword Street Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR
Lane Configurations		4TB		4TB			W	
Traffic Volume (veh/h)	0	410	1025	0	1025	0	10	5
Future Volume (Veh/h)	0	410	1025	0	1025	0	10	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	432	1079	0	11	5		
Pedestrians							75	
Lane Width (m)							3.0	
Walking Speed (m/s)							1.1	
Percent Blockage							6	
Right turn flare (veh)								
Median type		None		None				
Median storage (veh)								
Upstream signal (m)		100		91				
pX platoon unblocked		0.78		0.78			0.79	0.78
vC, conflicting volume		1154					1370	614
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol		643					880	0
IC, single (s)		4.1					6.8	6.9
IC, 2 stage (s)								
IF (s)		2.2					3.5	3.3
p0 queue free %		100					95	99
dM capacity (veh/h)		703					216	806
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2		
Volumes Total	216	216	540	540	16	16		
Volume Left	0	0	0	0	11	11		
Volume Right	0	0	0	0	0	0		
CSH	1700	1700	1700	1700	279	279		
Volumes to Capacity	0.13	0.13	0.32	0.32	0.32	0.06		
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.4	1.4		
Control Delay (s)	0.0	0.0	0.0	0.0	18.7	18.7		
Lane LOS					C	C		
Approach Delay (s)	0.0	0.0	0.0	0.0	18.7	18.7		
Approach LOS					C	C		
Intersection Summary								
Average Delay	0.2							
Intersection Capacity Utilization	38.3% ICU Level of Service							
Analysis Period (min)	15							

Timings  
8: River Street & Gerrard Street E

Existing AM Model  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	105	270	150	820	40	265	125	325	165			
Future Volume (vph)	105	270	150	820	40	265	125	325	165			
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	2.9	6.10	6.10	8.12	4.11	4.11	4.11	4.11	4.11	2	4	6
Permitted Phases	2	2	6	6	8	8	4	4	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)										23.0	19.0	23.0
Minimum Spilt (s)										33.8	30.0	33.8
Total Spilt (s)										34.0	36.0	34.0
Total Spilt (%)										37%	39%	37%
Yellow Time (s)										3.0	3.0	3.0
All-Red Time (s)										7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode										Min	Min	Min
Act Effct Green (s)	30.8		30.8	29.4	29.4	29.4	29.4	29.4	29.4			
Actuated g/C Ratio	0.41		0.41	0.39	0.39	0.39	0.39	0.39	0.39			
v/C Ratio	0.63		1.10	0.14	0.50	0.43	0.47	0.28	0.28			
Control Delay	23.3		84.0	16.6	19.5	22.4	19.8	7.3	7.3			
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	23.3		84.0	16.6	19.5	22.4	19.8	7.3	7.3			
LOS	C		F	B	B	C	B	B	A			
Approach Delay	23.3		84.0	19.2	17.0							
Approach LOS	C		F	B	B							
Intersection Summary												
Cycle Length	93											
Actuated Cycle Length	75.5											
Natural Cycle	90											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	1.10											
Intersection Signal Delay	48.6											
Intersection Capacity Utilization	113.0%											
Analysis Period (min)	15											



Timings  
8: River Street & Gerrard Street E

Existing AM Model  
03-22-2023

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Spilt (s)	30.0	11.0	11.0	12.0	12.0
Total Spilt (s)	36.0	11.0	11.0	12.0	12.0
Total Spilt (%)	39%	12%	12%	13%	13%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues  
8: River Street & Gerrard Street E

Existing AM Model  
03-22-2023

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	437	1198	42	339	130	339	172
Lane Group Flow (vph)	0.63	1.10	0.14	0.50	0.43	0.47	0.28
v/c Ratio	23.3	84.0	16.6	19.5	22.4	19.8	7.3
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	23.3	84.0	16.6	19.5	22.4	19.8	7.3
Total Delay	21.2	80.7	4.1	37.1	14.5	38.6	5.5
Queue Length 50th (m)	49.8	#175.6	10.3	58.5	28.8	59.3	16.9
Queue Length 95th (m)	67.0	81.6		126.5		61.7	
Internal Link Dist (m)			30.0		30.0		
Turn Bay Length (m)	695	1086	353	803	352	840	701
Base Capacity (vph)	0	0	0	0	0	0	0
Stavation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	1.10	0.12	0.42	0.37	0.40	0.25
<b>Intersection Summary</b>							
#	95th percentile volume exceeds capacity, queue may be longer.						
	Queue shown is maximum after two cycles.						

HCM Signalized Intersection Capacity Analysis  
8: River Street & Gerrard Street E

Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4TB			4TB		
Traffic Volume (vph)	105	270	45	150	820	180	40	265	60	125	325	165
Future Volume (vph)	105	270	45	150	820	180	40	265	60	125	325	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Lane Util. 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
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frt Protected	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Satd. Flow (prot)	3181	3181	3181	3268	3268	3268	1526	1730	1560	1860	1425	1425
Flt Permitted	0.52	0.52	0.52	0.80	0.80	0.80	0.48	1.00	0.48	1.00	1.00	1.00
Satd. Flow (perm)	1684	1684	1684	2638	2638	2638	769	1730	787	1860	1425	1425
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	109	281	47	156	854	188	42	276	62	130	339	172
RTOR Reduction (vph)	0	8	0	0	12	0	0	9	0	0	0	63
Lane Group Flow (vph)	0	429	0	0	1186	0	42	330	0	130	339	109
Confl. Peds. (#/hr)	50	95	95	95	95	95	50	40	85	85	40	10
Confl. Bikes (#/hr)	10	10	10	10	10	10	10	10	10	10	10	10
Heavy Vehicles (%)	4%	8%	4%	0%	0%	3%	1%	8%	4%	2%	3%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2.9	2.9	2.9	6.10	6.10	6.10	8.12	8.12	4.11	4.11	4.11	4.11
Permitted Phases	2.9	2.9	2.9	6.10	6.10	6.10	8.12	8.12	4.11	4.11	4.11	4.11
Actuated Green, G (s)	39.5	39.5	39.5	39.5	39.5	39.5	33.8	33.8	33.8	33.8	33.8	33.8
Effective Green, g (s)	40.5	40.5	40.5	40.5	40.5	40.5	34.8	34.8	34.8	34.8	34.8	34.8
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52	0.45	0.45	0.45	0.45	0.45	0.45
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	882	882	882	1382	1382	1382	346	778	354	837	641	641
v/s Ratio Prot							0.19					
v/s Ratio Perm	0.25	0.25	0.25	0.45	0.45	0.45	0.05	0.05	0.17	0.17	0.18	0.18
v/c Ratio	0.49	0.49	0.49	0.86	0.86	0.86	0.12	0.42	0.37	0.41	0.37	0.41
Uniform Delay, d1	11.8	11.8	11.8	15.9	15.9	15.9	12.4	14.4	14.0	14.3	12.6	12.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.4	5.5	5.5	5.5	0.2	0.4	0.6	0.3	0.1	0.1
Delay (s)	12.2	12.2	12.2	21.4	21.4	21.4	12.5	14.8	14.6	14.6	12.8	12.8
Level of Service	B	B	B	C	C	C	B	B	B	B	B	B
Approach Delay (s)	12.2	12.2	12.2	21.4	21.4	21.4	14.6	14.6	14.1	14.1	14.1	14.1
Approach LOS	B	B	B	C	C	C	B	B	B	B	B	B
<b>Intersection Summary</b>												
HCM 2000 Control Delay	17.2 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	77.3											
Intersection Capacity Utilization	113.0% Sum of lost time (s) 16.8 H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 9: Sackville Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
 10: Parliament Street & Oak Street

Existing AM Model  
 03-22-2023

Existing AM Model  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	5	5	5	5	5	0	10	5	10	90	5
Future Volume (Veh/h)	5	5	5	5	5	5	0	10	5	10	90	5
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	6	6	6	6	6	6	0	13	6	13	117	6
Pedestrians	70	70	70	40	40	40	15	15	15	10	10	10
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	6	6	6	4	4	4	1	1	1	1	1	1
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												58
PX platoon unblocked												
VC, conflicting volume	251	275	205	226	275	66	193					59
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	251	275	205	226	275	66	193					59
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	99	99	99	99	99	99	100					99
CM capacity (veh/h)	597	570	778	633	570	959	1306					1503
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	18	18	19	136								
Volume Left	6	6	0	13								
Volume Right	6	6	6	6								
cSH	636	686	1306	1503								
Volumes to Capacity	0.03	0.03	0.00	0.01								
Queue Length 95th (m)	0.7	0.6	0.0	0.2								
Control Delay (s)	10.8	10.4	0.0	0.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.8	10.4	0.0	0.8								
Approach LOS	B	B	A	A								
Intersection Summary												
Average Delay	2.5											
Intersection Capacity Utilization	27.2%											
ICU Level of Service	A											
Analysis Period (min)	15											

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	20	40	375	10	15	460
Future Volume (Veh/h)	20	40	375	10	15	460
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	42	395	11	16	484
Pedestrians	260	260	5	5	175	175
Lane Width (m)	3.0	3.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	20	20	0	0	15	15
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)			151			143
PX platoon unblocked						
VC, conflicting volume	940	638				666
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	914	638				666
IC, single (s)	6.8	7.0				4.1
IC, 2 stage (s)						
IF (s)	3.5	3.3				2.2
p0 queue free %	90	85				98
CM capacity (veh/h)	214	280				749
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	63	263	143	177	323	
Volume Left	21	0	0	16	0	
Volume Right	42	0	11	0	0	
cSH	254	1700	1700	749	1700	
Volumes to Capacity	0.25	0.15	0.08	0.02	0.19	
Queue Length 95th (m)	7.2	0.0	0.0	0.5	0.0	
Control Delay (s)	23.8	0.0	0.0	1.1	0.0	
Lane LOS	C	A	A	A	A	
Approach Delay (s)	23.8	0.0	0.0	0.4	0.0	
Approach LOS	C	A	A	A	A	
Intersection Summary						
Average Delay	1.8					
Intersection Capacity Utilization	43.6%					
ICU Level of Service	A					
Analysis Period (min)	15					



HCM Unsignalized Intersection Capacity Analysis  
11: Oak Street & Dreamer's Way

HCM Unsignalized Intersection Capacity Analysis  
12: Regent Street & Oak Street

Existing AM Model  
03-22-2023

Existing AM Model  
03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	25	55	0	0	10
Future Volume (Veh/h)	0	25	55	0	0	10
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	30	67	0	0	12
Pedestrians	15				40	
Lane Width (m)	3.5	3.5	3.0	3.0		
Walking Speed (m/s)	1.1	1.1	1.1	1.1		
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None	None	None	None		
Median storage (veh)						
Upstream signal (m)						
PX platoon unblocked						
VC conflicting volume	107				137	122
VC1 stage 1 conf vol						
VC2 stage 2 conf vol	107				137	122
VCu unblocked vol	4.1				6.4	6.3
IC single (s)						
IC 2 stage (s)	2.2				3.5	3.4
p0 queue free %	100				100	99
CM capacity (veh/h)	1451				835	864
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	30	67	12			
Volume Left	0	0	0			
Volume Right	0	0	12			
cSH	1700	1700	864			
Volumes to Capacity	0.02	0.04	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			1.0			A
Intersection Capacity Utilization			26.0%		ICU Level of Service	A
Analysis Period (min)			15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	25	0	0	25	30	25
Future Volume (Veh/h)	25	0	0	25	30	25
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	32	0	0	32	38	32
Pedestrians	15			10	30	
Lane Width (m)	3.5	3.5	3.0	3.0		
Walking Speed (m/s)	1.1	1.1	1.1	1.1		
Percent Blockage	1			1	2	
Right turn flare (veh)						
Median type	None	None	None	None		
Median storage (veh)						
Upstream signal (m)						
PX platoon unblocked						
VC conflicting volume				62	109	72
VC1 stage 1 conf vol						
VC2 stage 2 conf vol				62	109	72
VCu unblocked vol				4.1	6.4	6.2
IC single (s)						
IC 2 stage (s)				2.2	3.5	3.3
p0 queue free %	100			100	96	97
CM capacity (veh/h)	1519			852	954	
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	32	32	70			
Volume Left	0	0	38			
Volume Right	0	0	32			
cSH	1700	1700	896			
Volumes to Capacity	0.02	0.02	0.08			
Queue Length 95th (m)	0.0	0.0	1.9			
Control Delay (s)	0.0	0.0	9.4			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.4			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			4.9			A
Intersection Capacity Utilization			26.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
13: Oak Street & Site Driveway

Existing AM Model  
03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	45	20	0	0	5
Future Volume (Veh/h)	5	45	20	0	0	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	7	63	28	0	0	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	53				240	53
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	53				240	53
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
CM capacity (veh/h)	1536				664	1001
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	70	28	7			
Volume Left	7	0	0			
Volume Right	0	0	7			
cSH	1536	1700	1001			
Volumes to Capacity	0.00	0.02	0.01			
Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	0.8	0.0	8.6			
Lane LOS	A	A	A			
Approach Delay (s)	0.8	0.0	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			19.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
14: Sackville Street & Oak Street

Existing AM Model  
03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	10	25	10	0	10	5
Future Volume (vph)	10	25	10	0	10	5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	12	31	12	0	12	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	55	18	117			
Volume Left (vph)	12	0	12			
Volume Right (vph)	12	6	6			
Head (s)	-0.01	-0.09	0.07			
Departure Headway (s)	4.2	4.1	4.1			
Degree Utilization, x	0.06	0.02	0.13			
Capacity (veh/h)	835	841	848			
Control Delay (s)	7.5	7.2	7.8			
Approach Delay (s)	7.5	7.2	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			32.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 15: Sumach Street & Oak Street

HCM Unsignalized Intersection Capacity Analysis  
 16: Tubman Avenue & Oak Street

Existing AM Model  
 03-22-2023

Existing AM Model  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	5	20	10	0	0	0	15	30	35	5	60	0
Future Volume (vph)	5	20	10	0	0	0	15	30	35	5	60	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	7	27	13	0	0	0	20	40	47	7	80	0
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total (vph)	47	107	87									
Volume Left (vph)	7	20	7									
Volume Right (vph)	13	47	0									
Head (s)	-0.07	-0.10	0.13									
Departure Headway (s)	4.2	4.0	4.2									
Degree Utilization, x	0.06	0.12	0.10									
Capacity (veh/h)	808	877	834									
Control Delay (s)	7.5	7.5	7.7									
Approach Delay (s)	7.5	7.5	7.7									
Approach LOS	A	A	A									
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			30.2%									A
Analysis Period (min)			15									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Traffic Volume (veh/h)	60	0	0	0	0	0
Future Volume (Veh/h)	60	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	80	0	0	0	0	0
Pedestrians	40	0	0	10	45	0
Lane Width (m)	3.5	0.0	0.0	0.0	1.1	1.1
Walking Speed (m/s)	1.1	0.0	0.0	1.1	1.1	1.1
Percent Blockage	4	0	0	0	0	0
Right turn flare (veh)	None	None	None	None	None	None
Median type	None	None	None	None	None	None
Median storage (veh)	None	None	None	None	None	None
Upstream signal (m)	None	None	None	None	None	None
PK, platoon unblocked	None	None	None	None	None	None
VC, conflicting volume	125	125	165	165	135	135
VC1, stage 1 conf vol	125	125	165	165	135	135
VC2, stage 2 conf vol	125	125	165	165	135	135
IC, single (s)	4.1	4.1	6.4	6.4	6.7	6.7
IC, 2 stage (s)	2.2	2.2	3.5	3.5	3.8	3.8
p0 queue free %	100	100	100	100	100	100
qM capacity (veh/h)	1474	1474	801	801	800	800
Direction, Lane #	EB 1	EB 1				
Volume Total	80	80				
Volume Left	0	0				
Volume Right	0	0				
CSH	1700	1700				
Volume to Capacity	0.05	0.05				
Queue Length 95th (m)	0.0	0.0				
Control Delay (s)	0.0	0.0				
Lane LOS						
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			23.9%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
17: Oak Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
18: River Street & Oak Street

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4			1	
Traffic Volume (veh/h)	5	55	0	0	5	0
Future Volume (Veh/h)	5	55	0	0	5	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	61	0	0	6	0
Pedestrians			10		10	
Lane Width (m)			0.0		3.0	
Walking Speed (m/s)			1.1		1.1	
Percent Blockage			0		1	
Right turn flare (veh)			None		None	
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						10
pX platoon unblocked					93	10
VC, conflicting volume	10					
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	10				93	10
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
CM capacity (veh/h)	1610				902	1069
Direction, Lane #	EB 1	SB 1				
Volumes Total	67	6				
Volume Left	6	6				
Volume Right	0	0				
cSH	1610	902				
Volumes to Capacity	0.00	0.01				
Queue Length 95th (m)	0.1	0.2				
Control Delay (s)	0.7	9.0				
Lane LOS	A	A				
Approach Delay (s)	0.7	9.0				
Approach LOS	A	A				
Intersection Summary						
Average Delay		1.4				A
Intersection Capacity Utilization		17.0%			ICU Level of Service	
Analysis Period (min)		15				

Movement	EBL	EBT	WBL	WBR	NBL	NBR	SBL	SBR
Lane Configurations		4		4				4
Traffic Volume (veh/h)	40	0	20	20	0	40	20	35
Future Volume (Veh/h)	40	0	20	20	0	40	20	35
Sign Control	Stop	Stop	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	44	0	22	22	0	44	22	38
Pedestrians		75		65		35		5
Lane Width (m)		3.5		3.5		3.5		3.5
Walking Speed (m/s)		1.1		1.1		1.1		1.1
Percent Blockage		7		6		3		0
Right turn flare (veh)								
Median type						None		None
Median storage (veh)								
Upstream signal (m)						143		151
pX platoon unblocked	0.93	0.93	0.88	0.93	0.93	0.90	0.88	0.90
VC, conflicting volume	1057	1084	643	1055	1073	394	608	400
VC1, stage 1 conf vol								
VC2, stage 2 conf vol								
VCu, unblocked vol	789	818	529	787	806	275	489	282
IC, single (s)	7.2	6.5	6.2	7.1	7.0	6.2	4.1	4.1
IC, 2 stage (s)								
IF (s)	3.6	4.0	3.3	3.5	4.5	3.3	2.2	2.2
p0 queue free %	79	100	95	90	100	93	100	97
CM capacity (veh/h)	213	247	442	218	211	647	894	1100
Direction, Lane #	EB 1	WB 1	NB 1	SB 1				
Volumes Total	66	66	335	571				
Volume Left	44	22	0	38				
Volume Right	22	44	22	0				
cSH	258	391	1700	1100				
Volumes to Capacity	0.26	0.17	0.20	0.03				
Queue Length 95th (m)	7.5	4.6	0.0	0.8				
Control Delay (s)	23.7	16.1	0.0	1.0				
Lane LOS	C	C	A	A				
Approach Delay (s)	23.7	16.1	0.0	1.0				
Approach LOS	C	C	C	C				
Intersection Summary								
Average Delay			3.1					
Intersection Capacity Utilization			65.5%		ICU Level of Service			C
Analysis Period (min)			15					



19: Parliament Street & Cole Street

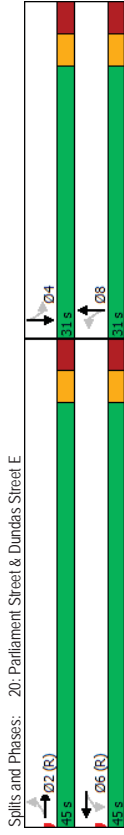
Existing AM Model  
03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	385	20	25	455
Future Volume (Veh/h)	0	0	385	20	25	455
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	418	22	27	495
Pedestrians	250		10			15
Lane Width (m)	0.0	3.5	3.5			3.5
Walking Speed (m/s)	1.1	1.1	1.1			1.1
Percent Blockage	0		1			1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.95	0.95	0.95	0.95	0.95	0.95
VC, conflicting volume	900	485				690
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	875	340				557
IC, single (s)	6.8	6.9				4.2
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IF (s)	100	100				97
CM capacity (veh/h)	266	617				942
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	279	161	192	330		
Volume Left	0	0	27	0		
Volume Right	0	22	0	0		
cSH	1700	1700	942	1700		
Volumes to Capacity	0.16	0.09	0.03	0.19		
Queue Length 95th (m)	0.0	0.0	0.7	0.0		
Control Delay (s)	0.0	0.0	1.5	0.0		
Lane LOS			A			
Approach Delay (s)	0.0		0.6			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			43.9%			
ICU Level of Service			A			
Analysis Period (min)			15			

20: Parliament Street & Dundas Street E

Existing AM Model  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	260	25	275	40	290	60	365
Future Volume (vph)	35	260	25	275	40	290	60	365
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4	
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	45.0	45.0	45.0	45.0	31.0	31.0	31.0	31.0
Total Split (%)	59.2%	59.2%	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)								
LeadLag	5.0		5.0		5.0		5.0	
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.7	41.7	41.7	41.7	24.3	24.3	24.3	24.3
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32
v/C Ratio	0.22	0.22	0.26	0.26	0.43	0.43	0.54	0.54
Control Delay	8.9	8.9	12.5	12.5	21.8	21.8	23.1	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	8.9	12.5	12.5	21.8	21.8	23.1	23.1
LOS	A	A	B	B	C	C	C	C
Approach Delay	8.9		12.5		21.8		23.1	
Approach LOS	A		B		C		C	
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 54 (7%), Referenced to phase 2EBTL and 6:WBT, Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/C Ratio: 0.54								
Intersection Signal Delay: 17.1								
Intersection Capacity Utilization 87.0%								
Analysis Period (min) 15								



Existing AM Model  
03-22-2023

HCM Signalized Intersection Capacity Analysis  
20: Parliament Street & Dundas Street E

Existing AM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	341	405	368	485
Lane Group Flow (vph)	0.22	0.26	0.43	0.54
v/c Ratio	8.9	12.5	21.8	23.1
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	8.9	12.5	21.8	23.1
Total Delay	11.3	20.2	21.4	28.9
Queue Length 50th (m)	18.8	29.1	32.0	41.7
Queue Length 95th (m)	85.0	103.5	45.0	56.1
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1541	1579	911	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	0.22	0.26	0.40	0.51
<b>Intersection Summary</b>				

	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	260	25	25	275	80	40	290	15	60	355	40
Traffic Volume (vph)	35	260	25	25	275	80	40	290	15	60	355	40
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. 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
Frbp. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. psd/bikes	0.99	0.99	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.99	0.99	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Flt Protected	3155	3155	3068	3068	3104	3104	3104	3104	3104	3104	3104	3104
Satd. Flow (prot)	0.88	0.88	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Flt Permitted	2798	2798	2825	2825	2653	2653	2653	2653	2653	2653	2653	2653
Satd. Flow (perm)	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Peak-hour factor, PHF	37	277	27	27	293	85	43	309	16	64	378	43
Adj. Flow (vph)	0	8	0	0	30	0	0	4	0	0	10	0
RTOR Reduction (vph)	0	333	0	0	375	0	0	364	0	0	475	0
Lane Group Flow (vph)	155	110	110	110	155	140	160	160	160	160	140	140
Confl. Peds. (#/hr)	6	10%	4%	22%	5%	13%	18%	11%	13%	2%	5%	5%
Heavy Vehicles (%)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Turn Type	2	2	6	6	6	6	8	8	8	4	4	4
Protected Phases	2	2	6	6	6	6	8	8	8	4	4	4
Permitted Phases	40.7	40.7	40.7	40.7	40.7	23.3	23.3	23.3	23.3	23.3	23.3	23.3
Actuated Green, G (s)	41.7	41.7	41.7	41.7	41.7	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Effective Green, g (s)	0.55	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Actuated g/C Ratio	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	1535	1535	1550	1550	848	848	848	848	848	848	848	848
Lane Grp Cap (vph)	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.17	0.17	0.17
v/s Ratio Prot	0.22	0.22	0.24	0.24	0.43	0.43	0.43	0.43	0.43	0.54	0.54	0.54
v/s Ratio Perm	8.8	8.8	8.9	8.9	20.4	20.4	20.4	20.4	20.4	21.2	21.2	21.2
Uniform Delay, d1	1.00	1.00	1.59	1.59	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6
Incremental Delay, d2	9.1	9.1	14.5	14.5	20.7	20.7	20.7	20.7	20.7	21.8	21.8	21.8
Delay (s)	A	A	B	B	C	C	C	C	C	C	C	C
Level of Service	A	A	B	B	C	C	C	C	C	C	C	C
Approach Delay (s)	9.1	9.1	14.5	14.5	20.7	20.7	20.7	20.7	20.7	21.8	21.8	21.8
Approach LOS	A	A	B	B	C	C	C	C	C	C	C	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	17.0	17.0	HCM 2000 Level of Service	B								
HCM 2000 Volume to Capacity ratio	0.35	0.35	Sum of lost time (s)	10.0								
Actuated Cycle Length (s)	76.0	76.0	ICU Level of Service	E								
Intersection Capacity Utilization	87.0%	87.0%	Analysis Period (min)	15								
Analysis Period (min)	15	15	c Critical Lane Group									

21: Regent Street & Dundas Street E

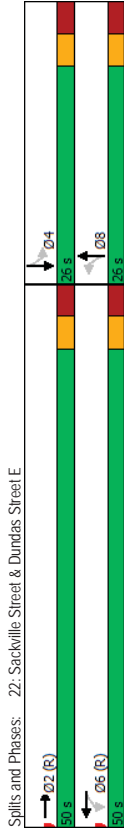
Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T				4T			4T	
Traffic Volume (veh/h)	10	325	10	10	355	35	15	10	5	20	10	20
Future Volume (Veh/h)	10	325	10	10	355	35	15	10	5	20	10	20
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	353	11	11	386	38	16	11	5	22	11	22
Pedestrians	20			5			70				80	
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2			0			6				7	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	127			124								
pX platoon unblocked												
VC, conflicting volume	504			434			713		976		257	721
VC1, stage 1 conf vol												963
VC2, stage 2 conf vol												312
VCU, unblocked vol	504			434			713		976		257	721
IC, single (s)	4.1			4.1			7.6		6.7		6.9	6.5
IC, 2 stage (s)	2.2			2.2			3.6		4.1		3.3	3.5
p0 queue free %	99			99			93		95		99	91
CM capacity (veh/h)	995			1066			235		200		699	242
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 1	SB 1					
Volumes Total	188	188	204	231	32	55						
Volume Left	11	0	11	0	16	22						
Volume Right	0	11	0	38	5	22						
cSH	995	1700	1066	1700	246	310						
Volumes to Capacity	0.01	0.11	0.01	0.14	0.13	0.18						
Queue Length 95th (m)	0.3	0.0	0.2	0.0	3.4	4.8						
Control Delay (s)	0.6	0.0	0.5	0.0	21.8	19.1						
Lane LOS	A	A	A	C	C	C						
Approach Delay (s)	0.3		0.3	21.8	19.1							
Approach LOS			C		C							
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	33.9%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											

22: Sackville Street & Dundas Street E

Existing AM Model  
03-22-2023

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4T		4T		4T		4T
Traffic Volume (vph)	360	10	330	45	0	35	50
Future Volume (vph)	360	10	330	45	0	35	50
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4
Permitted Phases	2	6	6	8	8	4	4
Detector Phase							
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Ad Effct Green (s)	47.6	47.6	47.6	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.24	0.24	0.24	0.24
v/C Ratio	0.20	0.33	0.22	0.22	0.22	0.22	0.22
Control Delay	6.8	5.5	5.5	12.9	12.9	20.2	20.2
Queue Delay	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Total Delay	6.8	5.8	5.8	12.9	12.9	20.2	20.2
LOS	A	A	A	B	B	C	C
Approach Delay	6.8	5.8	5.8	12.9	12.9	20.2	20.2
Approach LOS	A	A	A	B	B	C	C
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: T1 (14%), Referenced to phase 2EBT and 6,WBTL Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/C Ratio: 0.33							
Intersection Signal Delay: 8.6							
Intersection Capacity Utilization 49.5%							
Analysis Period (min) 15							
	ICU Level of Service A						



Queues  
22: Sackville Street & Dundas Street E

Existing AM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	405	358	73	122
Lane Group Flow (vph)	0.20	0.33	0.22	0.32
v/c Ratio	6.8	5.5	12.9	20.2
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	6.8	5.8	12.9	20.2
Total Delay	8.7	23.8	3.2	11.0
Queue Length 50th (m)	19.8	8.8	12.5	23.9
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2015	1073	376	426
Station Cap Reductn	0	272	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.45	0.19	0.29
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
22: Sackville Street & Dundas Street E

Existing AM Model  
03-22-2023

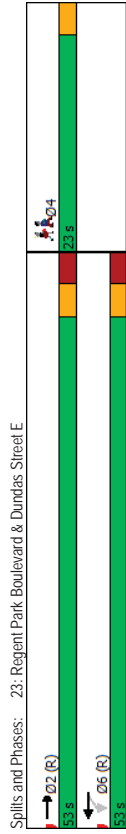
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4	4					4			4		
Traffic Volume (vph)	0	360	25	10	330	0	45	0	25	35	50	30	
Future Volume (vph)	0	360	25	10	330	0	45	0	25	35	50	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.99	0.99	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.98	0.98	0.98	
Frbp. ped/bikes	1.00	1.00	1.00	1.00	0.96	0.96	0.96	0.96	0.96	0.97	0.97	0.97	
Frt	0.99	0.99	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.96	0.96	0.96	
Flt Protected	1.00	1.00	1.00	1.00	0.97	0.97	0.97	0.97	0.97	0.99	0.99	0.99	
Sat'd. Flow (prot)	3220	3220	1735	1735	1545	1545	1545	1545	1545	1630	1630	1630	
Flt Permitted	1.00	0.99	0.99	0.99	0.78	0.78	0.78	0.78	0.78	0.89	0.89	0.89	
Sat'd. Flow (perm)	3220	1714	1714	1250	1250	1250	1250	1250	1481	1481	1481	1481	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	379	26	11	347	0	47	0	26	37	53	32	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	405	0	0	358	0	40	0	40	0	105	0	
Confl. Peds. (#/hr)	65	85	85	65	65	65	65	65	60	60	60	65	
Confl. Bikes (#/hr)	10	10	10	25	25	25	25	25	25	25	25	25	
Heavy Vehicles (%)	0%	8%	13%	0%	8%	0%	0%	0%	8%	6%	2%	4%	
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Protected Phases	2	6	6	6	6	6	8	8	8	8	4	4	
Permitted Phases													
Actuated Green, C (s)	46.6	46.6	46.6	46.6	46.6	46.6	17.4	17.4	17.4	17.4	17.4	17.4	
Effective Green, G (s)	47.6	47.6	47.6	47.6	47.6	47.6	18.4	18.4	18.4	18.4	18.4	18.4	
Actuated q/C Ratio	0.63	0.63	0.63	0.63	0.63	0.63	0.24	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2016	1073	1073	302	302	302	358	358	358	358	358	358	
v/s Ratio Prot	0.13	0.21	0.21	0.03	0.03	0.03	0.07	0.07	0.07	0.07	0.07	0.07	
v/s Ratio Perm	0.20	0.33	0.33	0.13	0.13	0.13	0.29	0.29	0.29	0.29	0.29	0.29	
Uniform Delay, d1	6.1	6.7	6.7	22.6	22.6	22.6	23.5	23.5	23.5	23.5	23.5	23.5	
Progression Factor	0.96	0.60	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.8	0.8	0.2	0.2	0.2	0.5	0.5	0.5	0.5	0.5	0.5	
Delay (s)	6.0	4.9	4.9	22.8	22.8	22.8	23.9	23.9	23.9	23.9	23.9	23.9	
Level of Service	A	A	A	C	C	C	C	C	C	C	C	C	
Approach Delay (s)	6.0	4.9	4.9	22.8	22.8	22.8	23.9	23.9	23.9	23.9	23.9	23.9	
Approach LOS	A	A	A	C	C	C	C	C	C	C	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	9.2											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.5%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													



Timings 23: Regent Park Boulevard & Dundas Street E

Existing AM Model  
03-22-2023

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	4	4	4	4
Traffic Volume (vph)	405	20	340	4
Future Volume (vph)	405	20	340	4
Turn Type	NA	Perm	NA	NA
Protected Phases	2	6	6	4
Permitted Phases	2	6	6	4
Detector Phase	2	6	6	4
Switch Phase	2	6	6	4
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	64.8
Actuated g/C Ratio	0.85	0.85	0.85	0.85
v/c Ratio	0.30	0.26	0.26	0.26
Control Delay	3.5	4.3	4.3	4.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.5	4.3	4.3	4.3
LOS	A	A	A	A
Approach Delay	3.5	4.3	4.3	4.3
Approach LOS	A	A	A	A
Intersection Summary				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 8 (1%) Referenced to phase 2:EBT and 6:WBL, Start of 1st Green				
Natural Cycle: 50				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.30				
Intersection Signal Delay: 3.9				
Intersection Capacity Utilization 53.6%				
Analysis Period (min) 15				



Queues 23: Regent Park Boulevard & Dundas Street E

Existing AM Model  
03-22-2023

Lane Group	EBT	WBT
Lane Group Flow (vph)	438	375
v/c Ratio	0.30	0.26
Control Delay	3.5	4.3
Queue Delay	0.0	0.0
Total Delay	3.5	4.3
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	22.1	36.3
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1466	1429
Starvation Cap Reductn	54	121
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.31	0.29
Intersection Summary		

23: Regent Park Boulevard & Dundas Street E

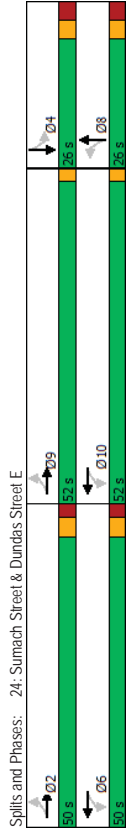
Existing AM Model  
03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4	4	4	4	4	4
Traffic Volume (vph)	405	15	20	340	0	0
Future Volume (vph)	405	15	20	340	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.99		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	1.00		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1718		1720			
Flt Permitted	1.00		0.97			
Sat'd Flow (perm)	1718		1673			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	422	16	21	354	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	437	0	0	375	0	0
Conf. Peds. (#/hr)	125	125		40	60	
Heavy Vehicles (%)	8%	0%	9%	8%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases			6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1358		1322			
v/s Ratio Prot	0.25					
v/s Ratio Perm	0.32		0.22			
w/s Ratio	2.2		2.1			
Uniform Delay, d1	0.74		1.00			
Progression Factor	0.6		0.5			
Incremental Delay, d2	2.3		2.7			
Delay (s)	A		A			
Level of Service	2.3		2.7			
Approach Delay (s)	A		A			
Approach LOS	A		A			
Intersection Summary						
HCM 2000 Control Delay	2.5		HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.28					
Actuated Cycle Length (s)	76.0		Sum of lost time (s)	7.9		
Intersection Capacity Utilization	53.6%		ICU Level of Service	A		
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

Existing AM Model  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4	4
Traffic Volume (vph)	15	370	25	325	15	30	15	30
Future Volume (vph)	15	370	25	325	15	30	15	30
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2, 9		6, 10		8		4	
Permitted Phases	2		6		8		4	
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0		-1.0		-1.0		-1.0	
Total Lost Time (s)	5.0		5.0		5.0		5.0	
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode	None		None		None		None	
Act Effct Green (s)	67.7		67.7		25.0		25.0	
Actuated g/C Ratio	0.76		0.76		0.28		0.28	
w/C Ratio	0.35		0.34		0.27		0.18	
Control Delay	6.4		6.3		26.0		29.9	
Queue Delay	0.9		0.0		0.0		0.0	
Total Delay	7.4		6.3		26.0		29.9	
LOS	A		A		C		C	
Approach Delay	7.4		6.3		26.0		29.9	
Approach LOS	A		A		C		C	
Intersection Summary								
Cycle Length: 128								
Actuated Cycle Length: 88.6								
Natural Cycle: 100								
Control Type: Actuated-Uncoordinated								
Maximum w/C Ratio: 0.35								
Intersection Signal Delay: 10.4								
Intersection Capacity Utilization: 53.7%								
Analysis Period (min): 15								



Queues  
24: Sumach Street & Dundas Street E

Existing AM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	440	413	109	71
Lane Group Flow (vph)	0.35	0.34	0.27	0.18
v/c Ratio	6.4	6.3	26.0	29.9
Control Delay	0.9	0.0	0.0	0.0
Queue Delay	7.4	6.3	26.0	29.9
Total Delay	30.0	27.4	11.1	9.0
Queue Length 50th (m)	44.4	41.4	27.9	22.3
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1263	1218	400	393
Station Cap Reductn	544	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.34	0.27	0.18
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
24: Sumach Street & Dundas Street E

Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4		4			4			4			
Traffic Volume (vph)	15	370	20	25	325	30	15	30	55	15	30	20	
Future Volume (vph)	15	370	20	25	325	30	15	30	55	15	30	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	4.0			4.0			4.0			4.0			
Lane Util. Factor	1.00	1.00		1.00			1.00			1.00			
Frbp. ped/bikes	0.98	0.98		0.98			0.93			0.91			
Frbp. ped/bikes	1.00	0.99		0.99			0.97			0.96			
Frt	1.00	0.99		0.99			0.93			0.99			
Flt Protected	1.00	1.00		1.00			0.99			0.99			
Sat'd. Flow (prot)	1691	1669		1669			1432			1523			
Flt Permitted	0.98	0.96		0.96			0.95			0.92			
Sat'd. Flow (perm)	1665	1608		1608			1370			1419			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	402	22	27	353	33	16	33	60	16	33	22	
RTOR Reduction (vph)	0	1	0	0	2	0	0	34	0	0	13	0	
Lane Group Flow (vph)	0	439	0	0	411	0	0	75	0	0	58	0	
Confl. Peds. (#/hr)	70	135	135	70	120	70	120	50	50	120	50	120	
Confl. Bikes (#/hr)		5			30								
Heavy Vehicles (%)	13%	7%	14%	9%	8%	3%	11%	3%	10%	0%	3%	10%	
Turn Type	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA	Permitted	NA	
Protected Phases	2.9			6.10			8			4			
Permitted Phases		2.9		6.10			8			4			
Actuated Green, G (s)		68.2		68.2			13.9			13.9			
Effective Green, g (s)		69.2		69.2			14.9			14.9			
Actuated g/C Ratio		0.77		0.77			0.17			0.17			
Clearance Time (s)							6.0			6.0			
Vehicle Extension (s)							3.0			3.0			
Lane Grp Cap (vph)		1278		1235			226			234			
v/s Ratio Prot							60.05			0.04			
v/s Ratio Perm		0.26		0.33			0.33			0.25			
v/c Ratio		0.34		0.33			0.33			0.25			
Uniform Delay, d1		3.3		3.3			33.2			32.7			
Progression Factor		1.00		1.00			1.00			1.00			
Incremental Delay, d2		0.2		0.2			0.9			0.6			
Delay (s)		3.5		3.4			34.1			33.3			
Level of Service		A		A			C			C			
Approach Delay (s)		3.5		3.4			34.1			33.3			
Approach LOS		A		A			C			C			
<b>Intersection Summary</b>													
HCM 2000 Control Delay	8.7											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35												
Actuated Cycle Length (s)	90.1											Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.7%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													

25: Tubman Avenue & Dundas Street E

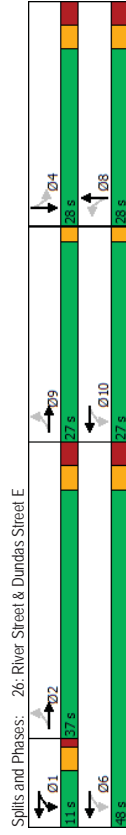
Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	425	15	5	380	0	0	0	0	0	0	0
Traffic Volume (veh/h)	0	425	15	5	380	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	425	15	5	380	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	472	17	6	422	0	0	0	0	0	0	0
Pedestrians	5			5			115			45		
Lane Width (m)	3.5			3.5			0.0			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			4		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	99			98								
pX platoon unblocked	0.89			0.94			0.93			0.93		
VC, conflicting volume	467			604			1034			964		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	344			543			842			885		
IC, single (s)	4.1			4.1			7.1			6.2		
IC, 2 stage (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			99			100			100		
CM capacity (veh/h)	1052			970			255			509		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	489	428	0									
Volume Left	0	6	0									
Volume Right	17	0	0									
cSH	1052	970	1700									
Volumes to Capacity	0.00	0.01	0.00									
Queue Length 95th (m)	0.0	0.1	0.0									
Control Delay (s)	0.0	0.2	0.0									
Lane LOS	A	A	A									
Approach Delay (s)	0.0	0.2	0.0									
Approach LOS	A	A	A									
Intersection Summary												
Average Delay	0.1											
Intersection Capacity Utilization	35.5%											
Analysis Period (min)	15											
ICU Level of Service	A											

26: River Street & Dundas Street E

Existing AM Model  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	5	395	100	305	30	245	95	360				
Traffic Volume (vph)	5	395	100	305	30	245	95	360				
Future Volume (vph)	5	395	100	305	30	245	95	360				
Turn Type	Perm	NA	custom	NA	Perm	NA	Perm	NA				
Protected Phases	2 9	1	1 6 10	8	4	4	4	4				
Permitted Phases	2	2	1	1 6	8	8	4	4				
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0			21.0	21.0	21.0	21.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)	10.0			27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	11.0			28.0	28.0	28.0	28.0	28.0	28.0	28.0	27.0	27.0
Total Split (%)	10.7%			27.2%	27.2%	27.2%	27.2%	27.2%	27.2%	27.2%	47%	26%
Yellow Time (s)	3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	1.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)				5.0	5.0	5.0	5.0	5.0				
Lead/Lag				Lead	Yes	Yes	Yes	Yes				
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes				
Recall Mode				None	None	None	None	None				
Act Effct Green (s)	29.7			43.1	23.7	23.7	23.7	23.7				
Actuated g/C Ratio	0.40			0.57	0.32	0.32	0.32	0.32				
v/c Ratio	0.66			0.55	0.26	0.26	0.26	0.26				
Control Delay	22.5			11.4	31.8	33.6	42.9	43.6				
Queue Delay	0.0			0.0	0.0	0.0	0.0	0.0				
Total Delay	22.5			11.4	31.8	33.6	42.9	43.6				
LOS	C			B	C	C	D	D				
Approach Delay	22.5			11.4	31.8	33.6	42.9	43.6				
Approach LOS	C			B	C	C	D	D				
Intersection Summary												
Cycle Length	103											
Actuated Cycle Length	75											
Natural Cycle	95											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	0.85											
Intersection Signal Delay	28.1											
Intersection Capacity Utilization	103.6%											
Analysis Period (min)	15											





Queues  
26: River Street & Dundas Street E

Existing AM Model  
03-22-2023

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	452	478	32	373	101	436
Lane Group Flow (vph)	0.66	0.55	0.26	0.71	0.58	0.85
v/c Ratio	22.5	11.4	31.8	33.6	42.9	43.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	22.5	11.4	31.8	33.6	42.9	43.6
Total Delay	48.7	33.8	2.9	37.8	10.3	48.7
Queue Length 50th (m)	72.1	50.0	15.2	#130.4	#49.2	#164.7
Queue Length 95th (m)	73.4	80.5		131.0		118.9
Internal Link Dist (m)			20.0		25.0	
Turn Bay Length (m)						
Base Capacity (vph)	843	997	124	523	173	514
Station Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.48	0.26	0.71	0.58	0.85

**Intersection Summary**  
# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
26: River Street & Dundas Street E

Existing AM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+	+									
Traffic Volume (vph)	5	395	25	100	305	45	30	245	105	95	360	50
Future Volume (vph)	5	395	25	100	305	45	30	245	105	95	360	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0			3.0			5.0		5.0			5.0
Lane Util. Factor	1.00			1.00			1.00		1.00			1.00
Frbp. ped/bikes	0.99			0.99			0.99		0.97			0.98
Frbp. psd/bikes	1.00			0.99			0.95		1.00			1.00
Frt	1.00			0.99			0.95		1.00			0.98
Flt Protected	1.00			0.99			0.95		1.00			1.00
Satd. Flow (prot)	1725			1702			1474		1633			1625
Flt Permitted	1.00			0.84			0.25		1.00			0.34
Satd. Flow (perm)	1717			1448			394		1633			1625
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	5	420	27	106	324	48	32	261	112	101	383	53
RTOR Reduction (vph)	0	3	0	0	6	0	0	13	0	0	4	0
Lane Group Flow (vph)	0	449	0	0	472	0	32	360	0	101	432	0
Confl. Peds. (#/hr)	65		90	90		65	65		45		45	15
Confl. Bikes (#/hr)			5			30						
Heavy Vehicles (%)	0%	7%	4%	3%	7%	0%	9%	9%	1%	5%	12%	7%
Turn Type	Perm	NA	NA	custom	NA	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2.9			1	1.6	1.0						4
Permitted Phases	2.9			6	10		8				4	
Actuated Green, G (s)	34.5			45.7			22.6		22.6		22.6	22.6
Effective Green, g (s)	35.5			41.7			23.6		23.6		23.6	23.6
Actuated g/C Ratio	0.47			0.55			0.31		0.31		0.31	0.31
Clearance Time (s)							6.0		6.0		6.0	6.0
Vehicle Extension (s)							3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	798			818			121		505		170	502
v/s Ratio Prot				c0.06			0.22				c0.27	
v/s Ratio Perm	c0.26			c0.25			0.08		0.18		0.18	0.18
v/c Ratio	0.56			0.58			0.26		0.71		0.59	0.86
Uniform Delay, d1	14.8			11.5			19.8		23.3		22.3	24.8
Progression Factor	1.00			1.00			1.00		1.00		1.00	1.00
Incremental Delay, d2	0.9			1.0			1.2		4.7		5.5	14.0
Delay (s)	15.7			12.5			21.0		28.1		27.8	38.8
Level of Service	B			B			C		C		C	D
Approach Delay (s)	15.7			12.5			21.5		27.5		36.7	
Approach LOS	B			B			C		C		D	D
Intersection Summary												
HCM 2000 Control Delay	23.5 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	76.3 Sum of lost time (s) 14.0											
Intersection Capacity Utilization	103.6% ICU Level of Service G											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 27: Dreamer's Way & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
 29: Sumach Street & Site Driveway

Existing AM Model  
 03-22-2023

Existing AM Model  
 03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑					
Traffic Volume (veh/h)	345	0	0	760	0	0
Future Volume (Veh/h)	345	0	0	760	0	0
Sign Control	Free	Stop	Free	Stop	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	383	0	0	844	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		None
Median type						
Median storage (veh)						
Upstream signal (m)	88			164		
pX platoon unblocked	0.98			0.90		0.98
VC, conflicting volume	383			805		192
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	330			467		134
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)						
p0 queue free %	2.2			3.5		3.3
IF (s)	100			100		100
CM capacity (veh/h)	1216			478		878
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volumes Total	255	128	281	563		
Volume Left	0	0	0	0		
Volume Right	0	0	0	0		
cSH	1700	1700	1216	1700		
Volumes to Capacity	0.15	0.08	0.00	0.33		
Queue Length 95th (m)	0.0	0.0	0.0	0.0		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS						
Approach Delay (s)	0.0		0.0			
Approach LOS			A			
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	24.3%					
ICU Level of Service	A					
Analysis Period (min)	15					

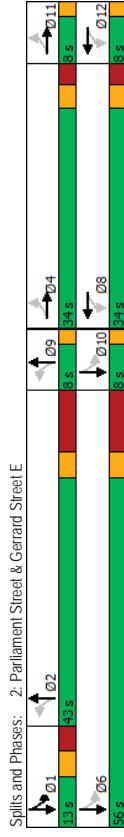
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑					↑
Traffic Volume (veh/h)	0	0	35	0	5	65
Future Volume (Veh/h)	0	0	35	0	5	65
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	39	0	6	72
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None		None		None	None
Median type						
Median storage (veh)						
Upstream signal (m)						57
pX platoon unblocked						
VC, conflicting volume	123		39			39
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	123		39			39
IC, single (s)	6.4		6.2			4.1
IC, 2 stage (s)						
p0 queue free %	3.5		3.3			2.2
IF (s)	100		100			100
CM capacity (veh/h)	874		1038			1584
Direction, Lane #	WB 1	NB 1	SB 1			
Volumes Total	0	39	78			
Volume Left	0	0	6			
Volume Right	0	0	0			
cSH	1700	1700	1584			
Volumes to Capacity	0.00	0.02	0.00			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.0	0.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.6			
Approach LOS			A			
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	10.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

03-22-2023  
Existing PM Model  
HCM Unsignalized Intersection Capacity Analysis  
1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4A	4A	
Traffic Volume (veh/h)	0	0	10	495	565	75
Future Volume (Veh/h)	0	0	10	495	565	75
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	11	556	635	84
Pedestrians	150			5	10	
Lane Width (m)	0.0			3.5	3.5	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)				None	None	
Median type				None	None	
Median storage (veh)				39		
Upstream signal (m)						
pX platoon unblocked	0.93					
VC, conflicting volume	1137	514	869			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1005	514	869			
IC, single (s)	6.8	6.9	4.3			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.3			
IF (s)	100	100	98			
CM capacity (veh/h)	220	508	717			
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	1%	371	423	296		
Volume Left	11	0	0	0		
Volume Right	0	0	0	84		
cSH	717	1700	1700	1700		
Volumes to Capacity	0.02	0.22	0.25	0.17		
Queue Length 95th (m)	0.4	0.0	0.0	0.0		
Control Delay (s)	0.7	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	0.3		0.0			
Approach LOS						
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	32.3%					
Analysis Period (min)	15					
	ICU Level of Service A					

03-22-2023  
Existing PM Model  
Timings  
2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		4TB		4TB		4TB		4TB
Traffic Volume (vph)	30	535	40	240	65	345	215	280
Future Volume (vph)	30	535	40	240	65	345	215	280
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases	4 11		8 12		2 9		1 16	2 4
Permitted Phases	4	4	8	8	2	2	1	1 6
Switch Phase								
Minimum Initial (s)							6.0	22.0
Minimum Split (s)							12.5	33.2
Total Split (s)							13.0	43.0
Total Split (%)							12.3%	41%
Yellow Time (s)							3.3	3.0
All-Red Time (s)							3.2	7.9
Lost Time Adjust (s)								2.8
Total Lost Time (s)								
Lead/Lag							Lead	Lag
Lead/Lag Optimize?							Yes	Yes
Recall Mode							None	None
Act Effct Green (s)	31.4		31.4		27.0		51.1	
Actuated g/C Ratio	0.34		0.34		0.29		0.55	
v/C Ratio	0.61		0.45		0.70		0.49	
Control Delay	28.3		21.3		35.0		13.3	
Queue Delay	0.0		0.0		0.0		0.0	
Total Delay	28.3		21.3		35.0		13.3	
LOS	C		C		C		B	
Approach Delay	28.3		21.3		35.0		13.3	
Approach LOS	C		C		C		B	
Intersection Summary								
Cycle Length	106							
Actuated Cycle Length	93							
Natural Cycle	95							
Control Type	Actuated-Uncoordinated							
Maximum v/C Ratio	0.70							
Intersection Signal Delay	24.4							
Intersection Capacity Utilization	98.0%							
Analysis Period (min)	15							
	ICU Level of Service F							



Timings  
2: Parliament Street & Gerrard Street E

Queues  
2: Parliament Street & Gerrard Street E

Existing PM Model  
03-22-2023

Existing PM Model  
03-22-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	8.0	8.0	8.0	8.0
Total Split (s)	8.0	8.0	8.0	8.0
Total Split (%)	8%	8%	8%	8%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	645	422	505	583
v/c Ratio	0.61	0.45	0.70	0.49
Control Delay	28.3	21.3	35.0	13.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.3	21.3	35.0	13.3
Queue Length 50th (m)	49.4	24.7	43.7	29.6
Queue Length 95th (m)	73.6	41.6	63.4	42.1
Internal Link Dist (m)	33.0	65.6	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1096	957	895	1236
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	0.59	0.44	0.56	0.47
Intersection Summary				



2. Parliament Street & Gerrard Street E

3. Sackville Street & Gerrard Street E

Existing PM Model  
03-22-2023

Existing PM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4TB		4TB		4TB	
Traffic Volume (vph)	30	535	60	40	240	130	65	345	80	215	280	70
Future Volume (vph)	30	535	60	40	240	130	65	345	80	215	280	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Lane Util. 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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd Flow (prot)	3414	3105	3183	3183	3183	3183	3183	3183	3183	3183	3183	3183
Flt Permitted	0.92	0.84	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Sat'd Flow (perm)	3133	2627	2459	2459	2459	2459	2459	2459	2459	2459	2459	2459
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	31	552	62	41	247	134	67	356	82	222	289	72
RTOR Reduction (vph)	0	7	0	0	49	0	0	12	0	0	12	0
Lane Group Flow (vph)	0	638	0	0	373	0	0	493	0	0	571	0
Conf. Peds. (#/hr)	130	120	120	130	125	130	125	235	235	235	125	125
Conf. Bikes (#/hr)	25	25	25	25	25	25	25	25	25	25	25	25
Heavy Vehicles (%)	10%	0%	5%	0%	0%	10%	4%	2%	2%	6%	4%	0%
Turn Type	Perim	MA	Perm	MA	Perm	MA	Perm	MA	Perm	MA	Perm	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9
Permitted Phases	4 11	8 12	8 12	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9
Actuated Green, G (s)	35.1	36.1	36.1	41.9	41.9	41.9	41.9	41.9	41.9	41.9	41.9	41.9
Effective Green, g (s)	36.1	36.1	36.1	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
Actuated g/C Ratio	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1201	1007	1007	1121	1121	1121	1121	1121	1121	1121	1121	1121
v/s Ratio Prot	c0.20	0.14	0.14	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20
v/s Ratio Perm	0.53	0.37	0.37	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
v/c Ratio	22.4	20.8	20.8	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.5	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Incremental Delay, d2	22.9	21.1	21.1	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7
Delay (s)	C	C	C	B	B	B	B	B	B	B	B	B
Level of Service	C	C	C	B	B	B	B	B	B	B	B	B
Approach Delay (s)	22.9	21.1	21.1	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7
Approach LOS	C	C	C	B	B	B	B	B	B	B	B	B
Intersection Summary												
HCM 2000 Control Delay	19.8 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	94.1 Sum of lost time (s) 22.5											
Intersection Capacity Utilization	98.0% ICU Level of Service F											
Analysis Period (min)	15											
c Critical Lane Group												

Regent Park Phases 4 & 5  
BA Group - NHY  
Page 5

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø6	Ø9	Ø10
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	935	35	505	5	0	135	40			
Future Volume (vph)	935	35	505	5	0	135	40			
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA			
Protected Phases	2 9	6 10	6 10	8	4	2	6			
Permitted Phases	2 9	6 10	6 10	8	4	2	6			
Detector Phase										
Switch Phase										
Minimum Initial (s)				20.0	20.0	20.0	16.0			
Minimum Split (s)				25.7	25.7	25.7	21.0			
Total Split (%)				24.3%	24.3%	24.3%	41%			
Yellow Time (s)				3.0	3.0	3.0	3.0			
All-Red Time (s)				2.7	2.7	2.7	2.0			
Lost Time Adjust (s)				-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)				4.7	4.7	4.7	4.7			
Lead-Lag										
Lead-Lag Optimize?										
Recall Mode										
Act Effct Green (s)	37.2	37.2	37.2	21.7	21.7	21.7	21.7			
Actuated g/C Ratio	0.55	0.55	0.55	0.32	0.32	0.32	0.32			
v/c Ratio	0.52	0.35	0.35	0.06	0.06	0.06	0.06			
Control Delay	10.1	8.6	8.6	5.0	5.0	5.0	5.0			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	10.1	8.6	8.6	5.0	5.0	5.0	5.0			
LOS	B	A	A	A	A	A	C			
Approach Delay	10.1	8.6	8.6	5.0	5.0	5.0	5.0			
Approach LOS	B	A	A	A	A	A	C			
Intersection Summary										
Cycle Length: 107										
Actuated Cycle Length: 67.8										
Natural Cycle: 85										
Control Type: Actuated-Uncoordinated										
Maximum v/c Ratio: 0.52										
Intersection Signal Delay: 11.5										
Intersection Capacity Utilization: 66.1%										
Analysis Period (min): 15										
Spills and Phases:	3- Sackville Street & Gerrard Street E									
	Ø2	Ø9	Ø6	Ø10	Ø4	Ø8				
	33 s	37 s	37 s	37 s	25 s	25 s				
	44 s	37 s	37 s	37 s	25 s	25 s				

Regent Park Phases 4 & 5  
BA Group - NHY  
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Existing PM Model  
03-22-2023

HCM Signalized Intersection Capacity Analysis  
3. Sackville Street & Gerrard Street E

Existing PM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	990	562	26	209
Lane Group Flow (vph)	0.52	0.35	0.06	0.49
v/c Ratio	10.1	8.6	5.0	26.2
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	10.1	8.6	5.0	26.2
Total Delay	36.4	18.3	0.0	22.0
Queue Length 50th (m)	49.3	26.7	3.8	47.6
Queue Length 95th (m)	138.2	47.8	34.3	15.3
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2215	1862	470	430
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.30	0.06	0.49
<b>Intersection Summary</b>				

	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBR	
Lane Configurations	4+4	4+4	4+4	4+4	4+4	4+4	4+4	4+4	
Traffic Volume (vph)	0	935	15	35	505	0	5	0	
Future Volume (vph)	0	935	15	35	505	0	5	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt Protected	3448	3448	3363	3363	1480	1480	1682	1682	
Satd. Flow (prot)	1.00	1.00	0.86	0.86	0.95	0.95	0.78	0.78	
Flt Permitted	3448	3448	2901	2901	1416	1416	1359	1359	
Satd. Flow (perm)	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Peak-hour factor, PHF	0	974	16	36	526	0	5	0	
Adj. Flow (vph)	0	2	0	0	0	0	18	0	
RTOR Reduction (vph)	0	988	0	0	562	0	8	0	
Lane Group Flow (vph)	85	70	70	85	90	60	60	90	
Confl. Bikes (#/hr)	0%	3%	0%	0%	6%	0%	5%	0%	
Heavy Vehicles (%)	NA	NA	NA	NA	NA	NA	NA	NA	
Turn Type	2.9	6.10	6.10	6.10	8	8	4	4	
Protected Phases	39.7	39.7	40.7	40.7	21.6	21.6	20.6	20.6	
Permitted Phases	0.60	0.60	0.60	0.60	0.32	0.32	0.32	0.32	
Actuated Green, G (s)	7.9	7.9	6.9	6.9	15.9	15.9	19.5	19.5	
Effective Green, g (s)	A	A	A	A	B	B	B	B	
Actuated q/C Ratio	7.9	7.9	6.9	6.9	15.9	15.9	19.5	19.5	
Clearance Time (s)	A	A	A	A	B	B	B	B	
Vehicle Extension (s)	2063	2063	1736	1736	449	449	431	431	
Lane Grp Cap (vph)	c0.29	c0.29	0.19	0.19	0.01	0.01	0.15	0.15	
v/s Ratio Prot	0.48	0.48	0.32	0.32	0.02	0.02	0.48	0.48	
v/s Ratio Perm	7.7	7.7	6.8	6.8	15.9	15.9	18.6	18.6	
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Progression Factor	0.2	0.2	0.1	0.1	0.0	0.0	0.8	0.8	
Incremental Delay, d2	A	A	A	A	B	B	B	B	
Delay (s)	7.9	7.9	6.9	6.9	15.9	15.9	19.5	19.5	
Level of Service	A	A	A	A	B	B	B	B	
Approach Delay (s)	7.9	7.9	6.9	6.9	15.9	15.9	19.5	19.5	
Approach LOS	A	A	A	A	B	B	B	B	
<b>Intersection Summary</b>									
HCM 2000 Control Delay	9.0				HCM 2000 Level of Service				A
HCM 2000 Volume to Capacity ratio	0.50								
Actuated Cycle Length (s)	68.0				Sum of lost time (s)				9.7
Intersection Capacity Utilization	66.1%				ICU Level of Service				C
Analysis Period (min)	15								
c Critical Lane Group									

HCM Unsignalized Intersection Capacity Analysis  
4: Gerrard Street E & Gifford Street

HCM Unsignalized Intersection Capacity Analysis  
5: Gerrard Street E & Nasmith Avenue

Existing PM Model  
03-22-2023

Existing PM Model  
03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	4↑		W	
Traffic Volume (veh/h)	10	1080	535	5	15	5
Future Volume (Veh/h)	10	1080	535	5	15	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	1271	629	6	18	6
Pedestrians		5			65	
Lane Width (m)		3.5	3.0		3.0	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0			5	
Right turn flare (veh)		None	None			
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
pX platoon unblocked	0.99			0.84	0.99	
VC conflicting volume	700			1356	388	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	685			1014	370	
IC single (s)	4.1			6.8	6.9	
IC 2 stage (s)	2.2			3.5	3.3	
p0 queue free %	99			90	99	
CM capacity (veh/h)	867			188	595	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	436	847	419	216	24	
Volume Left	12	0	0	0	18	
Volume Right	0	0	0	6	6	
cSH	867	1700	1700	1700	227	
Volumes to Capacity	0.01	0.50	0.25	0.13	0.11	
Queue Length 95th (m)	0.3	0.0	0.0	0.0	2.7	
Control Delay (s)	0.4	0.0	0.0	0.0	22.7	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0	22.7		
Approach LOS				C		
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	48.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	4↑		W	
Traffic Volume (veh/h)	5	1090	535	5	5	5
Future Volume (Veh/h)	5	1090	535	5	5	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	1253	615	6	6	6
Pedestrians					60	
Lane Width (m)		3.0			3.0	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage					5	
Right turn flare (veh)		None	None			
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
pX platoon unblocked	0.96			0.87	0.96	
VC conflicting volume	681			1316	370	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	588			868	266	
IC single (s)	4.1			6.8	6.9	
IC 2 stage (s)	2.2			3.5	3.3	
p0 queue free %	99			98	99	
CM capacity (veh/h)	915			244	678	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	424	835	410	211	12	
Volume Left	6	0	0	0	6	
Volume Right	0	0	0	6	6	
cSH	915	1700	1700	1700	359	
Volumes to Capacity	0.01	0.49	0.24	0.12	0.03	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.8	
Control Delay (s)	0.2	0.0	0.0	0.0	15.4	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0	15.4		
Approach LOS				C		
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	43.6%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings Existing PM Model  
03-22-2023

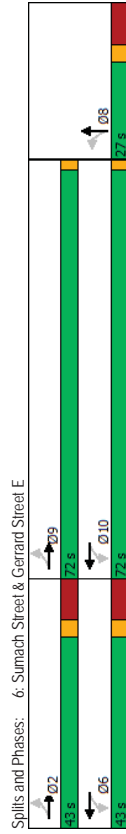
Queues Existing PM Model  
03-22-2023

6: Summach Street & Gerrard Street E

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations									
Traffic Volume (vph)	10	1075	20	530	25				
Future Volume (vph)	10	1075	20	530	25				
Turn Type	Perm	NA	Perm	NA	NA				
Protected Phases	2.9		6.10		8	2	6	9	10
Permitted Phases	2.9		6.10		8				
Detector Phase	2.9		6.10		6.10				
Switch Phase									
Minimum Initial (s)					15.0	11.0	11.0	5.0	5.0
Minimum Split (s)					25.4	26.2	26.2	72.0	72.0
Total Split (s)					27.0	43.0	43.0	72.0	72.0
Total Split (%)					19.0%	30%	30%	51%	51%
Yellow Time (s)					3.0	3.0	3.0	2.0	2.0
All-Red Time (s)					7.4	7.2	7.2	0.0	0.0
Lost Time Adjust (s)					-1.0				
Total Lost Time (s)					9.4				
Lead/Lag									
Lead-Lag Optimize?					None	Min	Min	None	None
Recall Mode					None				
Act Effct Green (s)		65.7		65.7	16.4				
Actuated g/C Ratio		0.72		0.72	0.18				
v/c Ratio		0.48		0.32	0.29				
Control Delay		8.9		7.1	24.2				
Queue Delay		0.0		0.0	0.0				
Total Delay		8.9		7.1	24.2				
LOS		A		A	C				
Approach Delay		8.9		7.1	24.2				
Approach LOS		A		A	C				
<b>Intersection Summary</b>									
Cycle Length	142								
Actuated Cycle Length	91.6								
Natural Cycle	125								
Control Type	Actuated-Uncoordinated								
Maximum v/c Ratio	0.48								
Intersection Signal Delay	9.0								
Intersection Capacity Utilization	66.4%								
Analysis Period (min)	15								

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	1128	655	93
v/c Ratio	0.48	0.32	0.29
Control Delay	8.9	7.1	24.2
Queue Delay	0.0	0.0	0.0
Total Delay	8.9	7.1	24.2
Queue Length 50th (m)	54.3	25.3	7.9
Queue Length 95th (m)	69.3	34.6	22.2
Internal Link Dist (m)	44.0	75.7	30.7
Turn Bay Length (m)			
Base Capacity (vph)	3215	2669	343
Starvation Cap Reductn	267	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.25	0.27
<b>Intersection Summary</b>			





HCM Signalized Intersection Capacity Analysis  
 6: Sumach Street & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
 7: Gerrard Street E & Sword Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4B					
Traffic Volume (vph)	10	1075	10	20	530	85	10	25	55	0	0	0
Future Volume (vph)	10	1075	10	20	530	85	10	25	55	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.5	3.0
Total Lost time (s)		9.2		9.2			9.4					
Lane Util. Factor	0.95	0.95		0.95			1.00					
Frbp, ped/bikes	1.00	0.96		0.96			0.95					
Frbp, ped/bikes	1.00	1.00		1.00			0.98					
Frt	1.00	0.98		0.98			0.92					
Flt Protected	1.00	1.00		1.00			0.99					
Sat'd Flow (prot)	3482	3235		3235			1600					
Flt Permitted	0.95	0.89		0.89			0.99					
Sat'd Flow (perm)	3301	2885		2885			1600					
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	1108	10	21	546	88	10	26	57	0	0	0
RTOR Reduction (vph)	0	0	0	8	0	0	40	0	0	0	0	0
Lane Group Flow (vph)	0	1128	0	0	647	0	0	53	0	0	0	0
Conf. Bikes (#/hr)	95	95	95	95	95	80	35	35	35	35	80	80
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perim	MA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2.9		6.10		6.10		8				
Permitted Phases		2.9		6.10		6.10		8				
Actuated Green, G (s)		70.2		70.2		70.2		11.2				
Effective Green, g (s)		71.2		71.2		71.2		12.2				
Actuated g/C Ratio		0.76		0.76		0.76		0.13				
Clearance Time (s)								10.4				
Vehicle Extension (s)								3.0				
Lane Grp Cap (vph)		2505		2189		2189		208				
v/s Ratio Prot												
v/s Ratio Perm		60.34		0.22		0.22		0.03				
v/c Ratio		0.45		0.30		0.30		0.25				
Uniform Delay, d1		4.1		3.5		36.7		36.7				
Progression Factor		1.00		1.00		1.00		1.00				
Incremental Delay, d2		0.1		0.1		0.6		0.6				
Delay (s)		4.3		3.6		37.4		37.4				
Level of Service		A		A		D		D				
Approach Delay (s)		4.3		3.6		37.4		37.4				0.0
Approach LOS		A		A		D		D				A
Intersection Summary												
HCM 2000 Control Delay	5.7 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	93.8											
Intersection Capacity Utilization	66.4%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR
Lane Configurations		4TB		4TB			4TB	
Traffic Volume (veh/h)	0	1130	625	0	15	10	15	10
Future Volume (Veh/h)	0	1130	625	0	15	10	15	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1256	694	0	17	11	65	11
Pedestrians							3.0	
Lane Width (m)							1.1	
Walking Speed (m/s)							5	
Percent Blockage								
Right turn flare (veh)								
Median type		None		None				
Median storage (veh)								
Upstream signal (m)		100		91				
pX platoon unblocked		0.95		0.91			0.91	0.95
vC, conflicting volume		759		1387			412	412
VC1, stage 1 conf vol								
VC2, stage 2 conf vol								
VCU, unblocked vol		638		972			273	273
IC, single (s)		4.1		6.8			7.1	7.1
IC, 2 stage (s)								
IF (s)		2.2		3.5			3.4	3.4
p0 queue free %		100		92			98	98
dM capacity (veh/h)		862		219			638	638
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1		
Volumes Total	628	628	347	347	28	28		
Volume Left	0	0	0	0	17	17		
Volume Right	0	0	0	0	0	0		
gSH	1700	1700	1700	1700	295	295		
Volumes to Capacity	0.37	0.37	0.20	0.20	0.09	0.09		
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.4	2.4		
Control Delay (s)	0.0	0.0	0.0	0.0	18.5	18.5		
Lane LOS					C	C		
Approach Delay (s)	0.0	0.0	0.0	0.0	18.5	18.5		
Approach LOS					C	C		
Intersection Summary								
Average Delay	0.3							
Intersection Capacity Utilization	41.2%							
ICU Level of Service	A							
Analysis Period (min)	15							

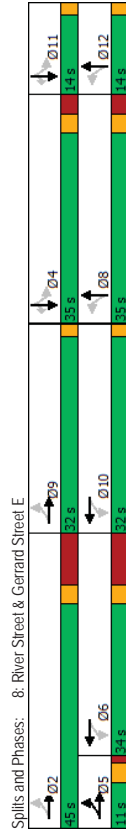
Timings  
8: River Street & Gerrard Street E

03-22-2023

Timings  
8: River Street & Gerrard Street E

03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	225	855	70	365	70	285	165	360	190			
Future Volume (vph)	225	855	70	365	70	285	165	360	190			
Turn Type	custom	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	5	5.2.9	6.10	6.10	8.12	8.12	4.11	4.11	4.11	2	4	6
Permitted Phases	5	5.2.9	6.10	6.10	8.12	8.12	4.11	4.11	4.11			
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0									23.0	19.0	23.0
Minimum Spilt (s)	10.0									33.8	30.0	33.8
Total Spilt (s)	11.0									45.0	35.0	34.0
Total Spilt (%)	8.7%									36%	28%	27%
Yellow Time (s)	3.0									3.0	3.0	3.0
All-Red Time (s)	1.0									7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None									Min	Min	Min
Act Effct Green (s)	51.9									32.9	32.9	32.9
Actuated g/C Ratio	0.56									0.35	0.35	0.35
v/C Ratio	0.85									0.92	0.57	0.31
Control Delay	22.7									30.4	30.4	5.3
Queue Delay	0.8									0.0	0.0	0.0
Total Delay	23.6									30.4	30.4	5.3
LOS	C									F	C	A
Approach Delay	23.6									34.6	35.8	
Approach LOS	C									C	D	D
Intersection Summary												
Cycle Length:	126											
Actuated Cycle Length:	93											
Natural Cycle:	120											
Control Type:	Actuated-Uncoordinated											
Maximum v/C Ratio:	0.92											
Intersection Signal Delay:	30.7											
Intersection Capacity Utilization:	113.3%											
Analysis Period (min):	15											



Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Spilt (s)	30.0	32.0	32.0	14.0	14.0
Total Spilt (s)	35.0	32.0	32.0	14.0	14.0
Total Spilt (%)	28%	25%	25%	11%	11%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues  
8: River Street & Gerrard Street E

Existing PM Model  
03-22-2023

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	1193	562	73	464	172	375	198
Lane Group Flow (vph)	0.85	0.82	0.30	0.74	0.92	0.57	0.31
v/c Ratio	22.7	35.6	29.5	35.4	82.5	30.4	5.3
Control Delay	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	23.6	35.6	29.5	35.4	82.5	30.4	5.3
Total Delay	64.8	41.9	7.6	55.4	23.7	43.7	0.0
Queue Length 50th (m)	111.9	74.3	24.9	127.8	#80.9	99.8	15.1
Queue Length 95th (m)	67.0	81.6		126.5		61.7	
Internal Link Dist (m)			30.0				
Turn Bay Length (m)							
Base Capacity (vph)	1409	688	240	624	187	658	629
Stavation Cap Reductn	60	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.82	0.30	0.74	0.92	0.57	0.31
<b>Intersection Summary</b>							
#	95th percentile volume exceeds capacity, queue may be longer.						
	Queue shown is maximum after two cycles.						

HCM Signalized Intersection Capacity Analysis  
8: River Street & Gerrard Street E

Existing PM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4TB					
Traffic Volume (vph)	225	855	65	70	365	105	70	285	160	165	360	190
Future Volume (vph)	225	855	65	70	365	105	70	285	160	165	360	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	3.0	9.8		9.8			5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.95	0.95		0.95			1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	0.99	0.99		0.99			1.00	0.98		1.00	1.00	0.97
Flpb, psd/bikes	1.00	1.00		1.00			0.99	1.00		0.98	1.00	1.00
Flt	0.99	0.99		0.99			1.00	0.95		1.00	1.00	0.85
Flt Protected	0.99	0.99		0.99			0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3387	3270		3270			1622	1729		1639	1860	1426
Flt Permitted	0.69	0.57		0.57			0.40	1.00		0.31	1.00	1.00
Satd. Flow (perm)	2365	1865		1865			681	1729		527	1860	1426
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	891	68	73	380	109	73	297	167	172	375	198
RTOR Reduction (vph)	0	4	0	0	16	0	0	15	0	0	0	118
Lane Group Flow (vph)	0	1189	0	0	546	0	73	449	0	172	375	80
Confl. Peds. (#/hr)	40	80	80	80	40	15	40	40	40	40	40	15
Confl. Bikes (#/hr)			35			15						15
Heavy Vehicles (%)	3%	2%	3%	0%	0%	4%	3%	0%	3%	1%	1%	2%
Turn Type	custom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	5	5	2	9	6	10	8	12	8	12	4	11
Permitted Phases	2	9		6	10		8	12		4	11	
Actuated Green, G (s)	54.0	45.2		42.8		37.5	37.5	37.5		37.5	37.5	37.5
Effective Green, g (s)	45.2	43.8		43.8		38.5	38.5	38.5		38.5	38.5	38.5
Actuated g/C Ratio	0.47	0.46		0.46		0.40	0.40	0.40		0.40	0.40	0.40
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1207			855			274	697		212	749	574
v/s Ratio Prot	c0.08						0.26					0.20
v/s Ratio Perm	c0.38			c0.29			0.11			c0.33		0.06
v/c Ratio	0.98			0.64			0.27	0.64		0.81		0.50
Uniform Delay, d1	24.8			19.8			19.1	23.0		25.3		21.3
Progression Factor	1.00			1.00			1.00	1.00		1.00		1.00
Incremental Delay, d2	22.1			1.6			0.5	2.1		20.5		0.5
Delay (s)	46.9			21.4			19.6	25.0		45.8		21.8
Level of Service	D			C			B	C		D		C
Approach Delay (s)	46.9			21.4			24.3			26.4		
Approach LOS	D			C			C			C		C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	33.2 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	95.5 Sum of lost time (s) 19.8											
Intersection Capacity Utilization	113.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 9: Sackville Street & Site Driveway

Existing PM Model  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	0	5	0	5	0	10	0	5	85	0
Future Volume (Veh/h)	10	0	0	5	0	5	0	10	0	5	85	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	0	0	6	0	6	0	12	0	6	100	0
Pedestrians	60			35			5			15		
Lane Width (m)	3.5			3.5			3.5			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	5			3			0			1		
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	205	219	165	164	219	62	160			47		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	205	219	165	164	219	62	160			47		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	99	100	99	100			100		
CM capacity (veh/h)	657	624	834	726	624	964	1356			1525		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	12	12	12	106								
Volume Left	12	6	0	6								
Volume Right	0	6	0	0								
cSH	657	828	1356	1525								
Volumes to Capacity	0.02	0.01	0.00	0.00								
Queue Length 95th (m)	0.4	0.3	0.0	0.1								
Control Delay (s)	10.6	9.4	0.0	0.4								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.6	9.4	0.0	0.4								
Approach LOS	B	A										
Intersection Summary												
Average Delay				2.0								
Intersection Capacity Utilization				26.6%								A
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis  
 10: Parliament Street & Oak Street

Existing PM Model  
 03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	35	455	25	25	355
Future Volume (Veh/h)	10	35	455	25	25	355
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	41	535	29	29	418
Pedestrians	220		5			55
Lane Width (m)	3.0		3.5			3.5
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	17		0			5
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			151			143
pX platoon unblocked	0.95	0.95		0.95		0.95
VC, conflicting volume	1042	557		784		
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	934	422		662		
IC, single (s)	6.8	6.9		4.3		
IC, 2 stage (s)						
IF (s)	3.5	3.3		2.3		
p0 queue free %	94	91		96		
CM capacity (veh/h)	202	440		678		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	53	357	207	168	279	
Volume Left	12	0	0	29	0	
Volume Right	41	0	29	0	0	
cSH	347	1700	1700	678	1700	
Volumes to Capacity	0.15	0.21	0.12	0.04	0.16	
Queue Length 95th (m)	4.0	0.0	0.0	1.0	0.0	
Control Delay (s)	17.2	0.0	0.0	2.2	0.0	
Lane LOS	C	A	A	A	A	
Approach Delay (s)	17.2	0.0	0.0	0.8		
Approach LOS	C					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			46.5%			A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
11: Oak Street & Dreamer's Way

HCM Unsignalized Intersection Capacity Analysis  
12: Regent Street & Oak Street

Existing PM Model  
03-22-2023

Existing PM Model  
03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	55	35	0	5	5
Future Volume (Veh/h)	0	55	35	0	5	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	59	38	0	5	5
Pedestrians	25	10			40	
Lane Width (m)	3.5	3.5	3.0		3.0	
Walking Speed (m/s)	1.1	1.1	1.1		1.1	
Percent Blockage	2	1			3	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume	78				147	103
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	78				147	103
IC single (s)	4.1				6.4	6.2
IC 2 stage (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
CM capacity (veh/h)	1487				817	908
Direction Lane #	EB 1	WB 1	SB 1			
Volumes Total	59	38	10			
Volume Left	0	0	5			
Volume Right	0	0	5			
cSH	1700	1700	860			
Volumes to Capacity	0.03	0.02	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			26.4%		ICU Level of Service	A
Analysis Period (min)			15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	60	0	0	20	15	45
Future Volume (Veh/h)	60	0	0	20	15	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	72	0	0	24	18	54
Pedestrians	15			15	40	
Lane Width (m)	3.5			3.5	3.0	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	3	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume				112	151	127
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol				112	151	127
IC single (s)				4.1	6.4	6.2
IC 2 stage (s)				2.2	3.5	3.3
p0 queue free %	100			100	98	94
CM capacity (veh/h)	1445			809	889	
Direction Lane #	EB 1	WB 1	NB 1			
Volumes Total	72	24	72			
Volume Left	0	0	18			
Volume Right	0	0	54			
cSH	1700	1700	867			
Volumes to Capacity	0.04	0.01	0.08			
Queue Length 95th (m)	0.0	0.0	2.1			
Control Delay (s)	0.0	0.0	9.5			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.5			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization			26.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
13: Oak Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
14: Sackville Street & Oak Street

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4			W	
Traffic Volume (veh/h)	10	95	20	0	5	0
Future Volume (Veh/h)	10	95	20	0	5	0
Sign Control	Free	Free	Free	Stop	Stop	
Grade	0%	0%	0%	0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	12	114	24	0	6	0
Pedestrians			65		35	
Lane Width (m)			3.5		3.0	
Walking Speed (m/s)			1.1		1.1	
Percent Blockage			6		3	
Right turn flare (veh)			None		None	
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	59				262	59
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	59				262	59
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
CM capacity (veh/h)	1516				666	986
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	126	24	6			
Volume Left	12	0	6			
Volume Right	0	0	0			
cSH	1516	1700	666			
Volume to Capacity	0.01	0.01	0.01			
Queue Length 95th (m)	0.2	0.0	0.2			
Control Delay (s)	0.8	0.0	10.5			
Lane LOS	A		B			
Approach Delay (s)	0.8	0.0	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			22.2%		ICU Level of Service	A
Analysis Period (min)			15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		Stop			Stop	Stop
Sign Control		Stop			Stop	Stop
Traffic Volume (vph)	10	75	20	5	5	0
Future Volume (vph)	10	75	20	5	5	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	83	22	6	6	0
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	116	12	95			
Volume Left (vph)	11	6	11			
Volume Right (vph)	22	0	6			
Head (s)	-0.07	0.27	0.03			
Departure Headway (s)	4.1	4.5	4.2			
Degree Utilization, x	0.13	0.01	0.11			
Capacity (veh/h)	864	775	824			
Control Delay (s)	7.7	7.6	7.7			
Approach Delay (s)	7.7	7.6	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			32.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 15: Sumach Street & Oak Street

HCM Unsignalized Intersection Capacity Analysis  
 16: Tubman Avenue & Oak Street

Movement	EBL	EBT	NB 1	NB 2	WBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop	Stop	Stop				Stop	Stop		Stop	Stop
Traffic Volume (vph)	20	55	10	0	0	0	5	70	75	10	30	5
Future Volume (vph)	20	55	10	0	0	0	5	70	75	10	30	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	22	60	11	0	0	0	5	77	82	11	33	5
Direction, Lane #												
Volume Total (vph)	93	164	49									
Volume Left (vph)	22	5	11									
Volume Right (vph)	11	82	5									
Head (s)	0.05	-0.22	0.11									
Departure Headway (s)	4.4	4.0	4.4									
Degree Utilization, x	0.11	0.18	0.06									
Capacity (veh/h)	779	882	795									
Control Delay (s)	8.0	7.8	7.7									
Approach Delay (s)	8.0	7.8	7.7									
Approach LOS	A	A	A									
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			32.2%									A
Analysis Period (min)			15									

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR
Lane Configurations							
Traffic Volume (veh/h)	130	10	0	0	0	0	0
Future Volume (Veh/h)	130	10	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	140	11	0	0	0	0	0
Pedestrians	20				5	30	
Lane Width (m)	3.5				0.0	0.0	
Walking Speed (m/s)	1.1				1.1	1.1	
Percent Blockage	2				0	0	
Right turn flare (veh)							
Median type	None				None		
Median storage (veh)							
Upstream signal (m)							
PK, platoon unblocked							
VC, conflicting volume		181			196	180	
VC1, stage 1 conf vol							
VC2, stage 2 conf vol							
VCu, unblocked vol		181			196	180	
IC, single (s)		4.1			6.4	6.2	
IC, 2 stage (s)		2.2			3.5	3.3	
p0 queue free %		100			100	100	
qM capacity (veh/h)		1407			784	867	
Direction, Lane #							
Volume Total	151						
Volume Left	0						
Volume Right	11						
CSH	1700						
Volume to Capacity	0.09						
Queue Length 95th (m)	0.0						
Control Delay (s)	0.0						
Lane LOS							
Approach Delay (s)	0.0						
Approach LOS							
Intersection Summary							
Average Delay					0.0		
Intersection Capacity Utilization					22.8%		A
Analysis Period (min)					15		

HCM Unsignalized Intersection Capacity Analysis  
17: Oak Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
18: River Street & Oak Street

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	5	125	0	0	10	0
Traffic Volume (veh/h)	5	125	0	0	10	0
Future Volume (Veh/h)	5	125	0	0	10	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	6	142	0	0	11	0
Pedestrians	5	5	5	5	25	5
Lane Width (m)	3.5	0.0	3.0	3.0	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	0	0	2	2
Right turn flare (veh)	None	None	None	None	None	None
Median type	None	None	None	None	None	None
Median storage (veh)	None	None	None	None	None	None
Upstream signal (m)	None	None	None	None	None	None
PX platoon unblocked	25	184	30	30	30	30
VC, conflicting volume	25	184	30	30	30	30
VC1, stage 1 conf vol	25	184	30	30	30	30
VC2, stage 2 conf vol	4.1	6.4	6.2	6.2	6.2	6.2
IC, single (s)	2.2	3.5	3.3	3.3	3.3	3.3
IC, 2 stage (s)	2.2	3.5	3.3	3.3	3.3	3.3
p0 queue free %	100	99	100	100	100	100
CM capacity (veh/h)	1572	792	792	1026	1026	1026
Direction, Lane #	EB 1	SB 1				
Volumes Total	148	11				
Volume Left	6	11				
Volume Right	0	0				
cSH	1572	792				
Volumes to Capacity	0.00	0.01				
Queue Length 95th (m)	0.1	0.3				
Control Delay (s)	0.3	9.6				
Lane LOS	A	A				
Approach Delay (s)	0.3	9.6				
Approach LOS	A	A				
Intersection Summary						
Average Delay		1.0				
Intersection Capacity Utilization		22.2%			ICU Level of Service	A
Analysis Period (min)		15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	85	5	45	15	0	40	0	390	30	30	465
Traffic Volume (veh/h)	85	5	45	15	0	40	0	390	30	30	465
Future Volume (Veh/h)	85	5	45	15	0	40	0	390	30	30	465
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	5	49	16	0	43	0	424	33	33	505
Pedestrians	75	75	45	45	45	50	50	3.5	3.5	3.5	5
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	7	7	4	4	4	4	4	4	4	4	0
Right turn flare (veh)	None	None	None	None	None	None	None	None	None	None	None
Median type	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)	None	None	None	None	None	None	None	None	None	None	None
Upstream signal (m)	None	None	None	None	None	None	None	None	None	None	151
PX platoon unblocked	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	151
VC, conflicting volume	1134	1148	630	1158	1132	490	580	580	580	580	502
VC1, stage 1 conf vol	1069	1084	473	1096	1065	490	414	414	414	414	502
VC2, stage 2 conf vol	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1	4.1	4.1	4.1
IC, single (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2
IC, 2 stage (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2	2.2	2.2	2.2
p0 queue free %	30	97	89	86	100	92	100	100	97	97	97
CM capacity (veh/h)	131	161	442	117	165	556	914	914	1030	1030	1030
Direction, Lane #	EB 1	WB 1	NB 1	SB 1							
Volumes Total	146	59	457	538							
Volume Left	92	16	0	33							
Volume Right	49	43	33	0							
cSH	173	275	1700	1030							
Volumes to Capacity	0.84	0.21	0.27	0.03							
Queue Length 95th (m)	44.8	6.0	0.0	0.8							
Control Delay (s)	86.0	21.6	0.0	0.9							
Lane LOS	F	C	A	A							
Approach Delay (s)	86.0	21.6	0.0	0.9							
Approach LOS	F	C	A	A							
Intersection Summary											
Average Delay			11.9								
Intersection Capacity Utilization			71.4%			ICU Level of Service					C
Analysis Period (min)			15								

19: Parliament Street & Cole Street

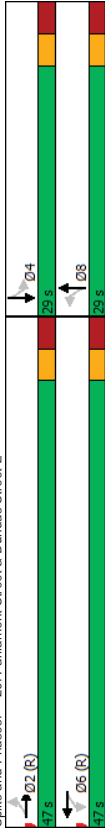
Existing PM Model  
03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	480	20	25	340
Future Volume (Veh/h)	0	0	480	20	25	340
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	571	24	30	405
Pedestrians	255	0	25	0	0	15
Lane Width (m)	0.0	3.5	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	2	0	0	1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)	0.91	0.91	80	0.91	0.91	214
pX platoon unblocked	1126	568				850
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	938	325				635
IC, single (s)	6.8	6.9				4.1
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IC queue free %	100	100				97
CM capacity (veh/h)	229	607				871
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	381	214	165	270		
Volume Left	0	0	30	0		
Volume Right	0	24	0	0		
cSH	1700	1700	871	1700		
Volumes to Capacity	0.22	0.13	0.03	0.16		
Queue Length 95th (m)	0.0	0.0	0.8	0.0		
Control Delay (s)	0.0	0.0	2.0	0.0		
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.7			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			41.6%			ICU Level of Service
Analysis Period (min)			15			A

20: Parliament Street & Dundas Street E

Existing PM Model  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	65	415	40	165	40	365	30	290
Future Volume (vph)	65	415	40	165	40	365	30	290
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
47.0 Split (s)	47.0	47.0	47.0	47.0	29.0	29.0	29.0	29.0
Total Split (%)	61.8%	61.8%	61.8%	61.8%	38.2%	38.2%	38.2%	38.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)			5.0					5.0
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.8	41.8	41.8	41.8	24.2	24.2	24.2	24.2
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32
v/C Ratio	0.39	0.23	0.23	0.53	0.42	0.42	0.42	0.42
Control Delay	10.3	10.8	10.8	23.1	21.6	21.6	21.6	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	10.8	10.8	23.1	21.6	21.6	21.6	21.6
LOS	B	B	B	C	C	C	C	C
Approach Delay								
Approach LOS								
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 9 (12%) Referenced to phase 2:EBTL and 6:WBTL Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/C Ratio: 0.53								
Intersection Signal Delay: 16.3								
Intersection Capacity Utilization 93.3%								
Analysis Period (min) 15								





Queues  
20: Parliament Street & Dundas Street E

03-22-2023

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	606	309	494	382
v/c Ratio	0.39	0.23	0.63	0.42
Control Delay	10.3	10.8	23.1	21.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.3	10.8	23.1	21.6
Queue Length 50th (m)	22.8	8.5	29.6	22.0
Queue Length 95th (m)	34.0	22.1	42.1	32.5
Internal Link Dist (m)	85.0	103.5	45.0	56.1
Turn Bay Length (m)				
Base Capacity (vph)	1544	1374	930	904
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	0.39	0.22	0.63	0.42
Intersection Summary				

HCM Signalized Intersection Capacity Analysis  
20: Parliament Street & Dundas Street E

03-22-2023

	→	←	↑	↓
Movement	EBL	EBT	EBR	WBL
Lane Configurations	4TB	4TB	4TB	4TB
Traffic Volume (vph)	65	415	60	165
Future Volume (vph)	65	415	60	165
Ideal Flow (vphpl)	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.95	0.95
Frbp. ped/bikes	0.98	0.98	0.98	0.98
Frbp. psd/bikes	0.98	0.98	0.98	0.98
Frt	0.98	0.98	0.98	0.98
Flt Protected	0.99	0.99	0.99	0.99
Satd. Flow (prot)	3179	2971	3273	3209
Flt Permitted	0.87	0.82	0.88	0.88
Satd. Flow (perm)	2772	2466	2896	2823
Peak-hour factor, PHF	0.89	0.89	0.89	0.89
Adj. Flow (vph)	73	466	67	185
RTOR Reduction (vph)	0	13	0	11
Lane Group Flow (vph)	0	593	0	298
Confl. Peds. (#/hr)	260	155	155	260
Confl. Bikes (#/hr)	25	25	20	20
Heavy Vehicles (%)	3%	6%	5%	6%
Parking (#/hr)	0	0	0	0
Turn Type	Perm	NA	Perm	NA
Protected Phases	2	6	6	8
Permitted Phases	2	6	6	8
Actuated Green, G (s)	40.8	40.8	23.2	23.2
Effective Green, g (s)	41.8	41.8	24.2	24.2
Actuated g/C Ratio	0.55	0.55	0.32	0.32
Clearance Time (s)	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1524	1356	922	898
v/s Ratio Prot				
v/s Ratio Perm	0.21	0.12	0.17	0.13
v/c Ratio	0.39	0.22	0.53	0.42
Uniform Delay, d1	9.8	8.8	21.2	20.4
Progression Factor	1.00	1.27	1.00	1.00
Incremental Delay, d2	0.8	0.4	0.5	0.3
Delay (s)	10.5	11.5	21.8	20.7
Level of Service	B	B	C	C
Approach Delay (s)	10.5	11.5	21.8	20.7
Approach LOS	B	B	C	C
Intersection Summary				
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.44	B		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)		
Intersection Capacity Utilization	93.3%	10.0		
Analysis Period (min)	15	F		
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis  
 21: Regent Street & Dundas Street E

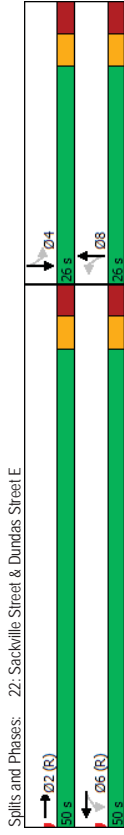
Existing PM Model  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T			4		4		4	
Traffic Volume (veh/h)	40	410	15	5	265	25	5	10	5	5	5	25
Future Volume (Veh/h)	40	410	15	5	265	25	5	10	5	5	5	25
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	43	441	16	5	285	27	5	11	5	5	5	27
Pedestrians	30			10			125					135
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	3			1			11					12
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)	127			124								
pX platoon unblocked												
VC, conflicting volume	447			582			872	1117	364	770	1112	321
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	447			546			840	1089	324	737	1083	321
IC, single (s)	4.1			4.4			7.5	6.5	7.9	7.5	6.5	6.9
IC, 2 stage (s)												
IF (s)	2.2			2.4			3.5	4.0	3.8	3.5	4.0	3.3
p0 queue free %	96			99			97	93	99	98	97	95
CM capacity (veh/h)	990			814			167	159	477	201	161	584
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 1	SB 1	SB 1				
Volume Total	264	236	148	170	21	37						
Volume Left	43	0	5	0	5	5						
Volume Right	0	16	0	27	5	27						
cSH	990	1700	814	1700	192	362						
Volumes to Capacity	0.04	0.14	0.01	0.10	0.11	0.10						
Queue Length 95th (m)	1.0	0.0	0.1	0.0	2.8	2.6						
Control Delay (s)	1.8	0.0	0.4	0.0	26.1	16.1						
Lane LOS	A	A	A	D	C	C						
Approach Delay (s)	1.0	0.2	26.1	16.1								
Approach LOS	D	C										
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	46.6%											
ICU Level of Service	A											
Analysis Period (min)	15											

Timings  
 22: Sackville Street & Dundas Street E

Existing PM Model  
 03-22-2023

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4T		4T		4T		4T
Traffic Volume (vph)	400	15	220	40	0	30	35
Future Volume (vph)	400	15	220	40	0	30	35
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4
Permitted Phases	2	6	6	8	8	4	4
Detector Phase							
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	47.6	47.6	47.6	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.24	0.24	0.24	0.24
v/C Ratio	0.23	0.24	0.24	0.23	0.23	0.28	0.28
Control Delay	5.0	6.1	6.1	13.2	17.1	17.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	6.1	6.1	13.2	17.1	17.1	17.1
LOS	A	A	A	B	B	B	B
Approach Delay	5.0	6.1	6.1	13.2	17.1	17.1	17.1
Approach LOS	A	A	A	B	B	B	B
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/C Ratio: 0.28							
Intersection Signal Delay: 7.4							
Intersection Capacity Utilization 48.0%							
ICU Level of Service A							
Analysis Period (min) 15							



Queues  
22: Sackville Street & Dundas Street E

Existing PM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	462	253	75	108
Lane Group Flow (vph)	0.23	0.24	0.23	0.28
v/c Ratio	5.0	6.1	13.2	17.1
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	5.0	6.1	13.2	17.1
Total Delay	10.3	15.7	3.4	7.8
Queue Length 50th (m)	13.5	15.3	12.9	19.6
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2046	1061	369	434
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.24	0.20	0.25
Intersection Summary				

HCM Signalized Intersection Capacity Analysis  
22: Sackville Street & Dundas Street E

Existing PM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4					4			4	
Traffic Volume (vph)	0	400	30	15	220	0	40	0	30	30	30	35
Future Volume (vph)	0	400	30	15	220	0	40	0	30	30	30	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.97	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.97	0.97	0.97
Frbp. psd/bikes	1.00	1.00	0.99	1.00	0.99	0.96	0.96	0.96	0.96	0.97	0.97	0.97
Frt	0.99	1.00	1.00	1.00	0.94	0.94	0.94	0.94	0.94	0.95	0.95	0.95
Flt Protected												
Sat'd. Flow (prot)	3265	1750	1750	1750	1494	1494	1494	1494	1494	1618	1618	1618
Flt Permitted	1.00	0.97	1.00	0.97	1.00	0.80	0.80	0.80	0.80	0.90	0.90	0.90
Sat'd. Flow (perm)	3265	1694	1694	1694	1226	1226	1226	1226	1226	1478	1478	1478
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	430	32	16	237	0	43	0	32	32	38	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	462	0	0	253	0	42	0	42	0	81	0
Confl. Peds. (#/hr)	105	175	175	175	105	70	55	55	55	55	55	70
Confl. Bikes (#/hr)	35	35	35	35	20	20	20	20	20	20	20	20
Heavy Vehicles (%)	0%	5%	6%	0%	6%	0%	0%	0%	12%	0%	2%	5%
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	2	6	6	6	6	8	8	8	8	8	8	4
Permitted Phases												
Actuated Green, G (s)	46.6	46.6	46.6	46.6	46.6	17.4	17.4	17.4	17.4	17.4	17.4	17.4
Effective Green, g (s)	47.6	47.6	47.6	47.6	47.6	18.4	18.4	18.4	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.63	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2044	1060	1060	1060	296	296	296	296	296	357	357	357
v/s Ratio Prot	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
v/s Ratio Perm	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	6.2	6.2	6.2	6.2	6.2	22.6	22.6	22.6	22.6	23.1	23.1	23.1
Uniform Delay, d1	0.68	0.68	0.68	0.68	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Incremental Delay, d2	4.5	4.5	4.5	4.5	4.5	22.8	22.8	22.8	22.8	23.4	23.4	23.4
Delay (s)	A	A	A	A	A	C	C	C	C	C	C	C
Level of Service	A	A	A	A	A	C	C	C	C	C	C	C
Approach Delay (s)	4.5	5.3	5.3	5.3	5.3	22.8	22.8	22.8	22.8	23.4	23.4	23.4
Approach LOS	A	A	A	A	A	C	C	C	C	C	C	C
Intersection Summary												
HCM 2000 Control Delay	8.5 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.23											
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 10.0											
Intersection Capacity Utilization	48.0% ICU Level of Service A											
Analysis Period (min)	15											
c Critical Lane Group												

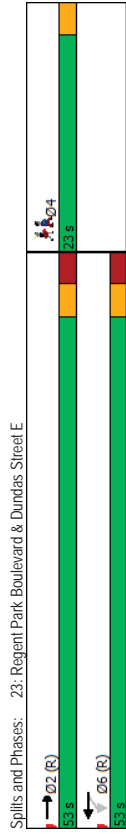
Timings 23: Regent Park Boulevard & Dundas Street E

Queues 23: Regent Park Boulevard & Dundas Street E

Existing PM Model  
03-22-2023

Existing PM Model  
03-22-2023

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	430	15	235	
Future Volume (vph)	430	15	235	
Turn Type	NA	Perm	NA	
Protected Phases	2	6	6	4
Permitted Phases		6	6	
Detector Phase	2	6	6	
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.9	4.9	4.9	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.36	0.19	0.19	
Control Delay	2.5	3.9	3.9	
Queue Delay	0.0	0.0	0.0	
Total Delay	2.5	3.9	3.9	
LOS	A	A	A	
Approach Delay	2.5	3.9	3.9	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 22 (29%), Referenced to phase 2EBT and 6WBT, Start of 1st Green				
Natural Cycle: 50				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.36				
Intersection Signal Delay: 3.0				
Intersection Capacity Utilization 44.6%				
ICU Level of Service A				
Analysis Period (min) 15				



Lane Group	EBT	WBT
Lane Group Flow (vph)	517	281
v/c Ratio	0.36	0.19
Control Delay	2.5	3.9
Queue Delay	0.0	0.0
Total Delay	2.5	3.9
Queue Length 50th (m)	0.1	0.0
Queue Length 95th (m)	12.9	25.8
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1450	1448
Starvation Cap Reductn	27	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.36	0.19
<b>Intersection Summary</b>		

23: Regent Park Boulevard & Dundas Street E

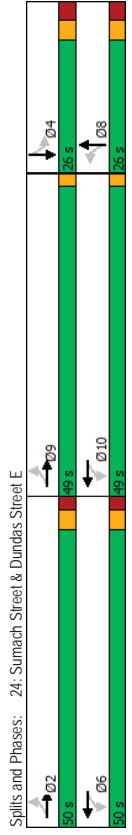
Existing PM Model  
03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Volume (vph)	430	30	15	235	0	0
Future Volume (vph)	430	30	15	235	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.97		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	0.99		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1698		1748			
Flt Permitted	1.00		0.97			
Sat'd Flow (perm)	1698		1694			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	483	34	17	264	0	0
RTOR Reduction (vph)	2	0	0	0	0	0
Lane Group Flow (vph)	515	0	0	281	0	0
Conf. Peds. (#/hr)	235	235	60	65		
Heavy Vehicles (%)	6%	6%	0%	6%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases			6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1342		1339			
v/s Ratio Prot	cd.30		0.17			
v/s Ratio Perm	0.38		0.21			
Uniform Delay, d1	2.4		2.0			
Progression Factor	0.43		1.00			
Incremental Delay, d2	0.8		0.4			
Delay (s)	1.9		2.4			
Level of Service	A		A			
Approach Delay (s)	1.9		2.4	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.0 HCM 2000 Level of Service A					
HCM 2000 Volume to Capacity ratio	0.34					
Actuated Cycle Length (s)	76.0 Sum of lost time (s)					
Intersection Capacity Utilization	44.6% ICU Level of Service A					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

Existing PM Model  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB				
Traffic Volume (vph)	35	380	25	215	25	90	15	20				
Future Volume (vph)	35	380	25	215	25	90	15	20				
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA				
Protected Phases	2,9		6,10		8		4					
Detector Phase	2		6		8		4					
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.0	16.0	5.0	5.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	21.0	21.0	49.0	49.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	50.0	50.0	49.0	49.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	40%	40%	39%	39%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)					-1.0							
Total Lost Time (s)					5.0							
Lead-Lag												
Lead-Lag Optimize?					None		None		Min	Min	None	None
Recall Mode												
Act Effct Green (s)	58.1		0.0		22.6		22.6					
Actuated g/C Ratio	0.64		0.64		0.25		0.25					
v/c Ratio	0.45		0.28		0.45		0.14					
Control Delay	8.3		6.4		37.1		29.2					
Queue Delay	1.3		0.0		0.0		0.0					
Total Delay	9.5		6.4		37.1		29.2					
LOS	A		A		D		C					
Approach Delay	9.5		6.4		37.1		29.2					
Approach LOS	A		A		D		C					
Intersection Summary												
Cycle Length	125											
Actuated Cycle Length	90.4											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	0.45											
Intersection Signal Delay	14.5											
Intersection Capacity Utilization	53.3%											
Analysis Period (min)	15											





Queues  
24: Sumach Street & Dundas Street E

Existing PM Model  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	463	280	172	49
Lane Group Flow (vph)	0.45	0.28	0.45	0.14
v/c Ratio	8.3	6.4	37.1	29.2
Control Delay	1.3	0.0	0.0	0.0
Queue Delay	9.5	6.4	37.1	29.2
Total Delay	32.6	16.6	26.9	6.0
Queue Length 50th (m)	48.5	26.3	51.5	16.8
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1196	1136	380	356
Station Cap Reductn	503	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.25	0.45	0.14
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
24: Sumach Street & Dundas Street E

Existing PM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		+		+				+			+		
Traffic Volume (vph)	35	380	15	25	215	20	25	90	45	15	20	10	
Future Volume (vph)	35	380	15	25	215	20	25	90	45	15	20	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	4.0			4.0				4.0			5.0		
Lane Util. Factor	1.00			1.00				1.00			1.00		
Frbp. ped/bikes	0.98			0.98				0.96			0.94		
Frbp. psd/bikes	0.99			0.98				0.97			0.98		
Frt	1.00			0.99				0.96			0.97		
Flt Protected	1.00			1.00				0.99			0.98		
Sat'd. Flow (prot)	1691			1639				1587			1586		
Flt Permitted	0.96			0.94				0.95			0.89		
Sat'd. Flow (perm)	1628			1550				1522			1433		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	38	409	16	27	231	22	27	97	48	16	22	11	
RTOR Reduction (vph)	0	1	0	0	3	0	0	10	0	0	8	0	
Lane Group Flow (vph)	0	462	0	0	277	0	0	162	0	0	41	0	
Confl. Peds. (#/hr)	100	185	185	100	105	100	105	50	50	50	105	105	
Confl. Bikes (#/hr)		25			20								
Heavy Vehicles (%)	12%	6%	8%	0%	9%	5%	4%	5%	6%	0%	9%	0%	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	2.9			6.10			8				4		
Permitted Phases	2.9			6.10			8				4		
Actuated Green, G (s)	60.7			60.7			21.5				21.5		
Effective Green, g (s)	61.7			61.7			22.5				22.5		
Actuated g/C Ratio	0.68			0.68			0.25				0.25		
Clearance Time (s)							6.0				6.0		
Vehicle Extension (s)							3.0				3.0		
Lane Grp Cap (vph)	1113			1060			379				357		
v/s Ratio Prot													
v/s Ratio Perm	60.28			0.18			60.11				0.03		
v/c Ratio	0.41			0.26			0.43				0.12		
Uniform Delay, d1	6.3			5.5			28.4				26.2		
Progression Factor	1.00			1.00			1.00				1.00		
Incremental Delay, d2	0.3			0.1			0.8				0.1		
Delay (s)	6.5			5.6			29.2				26.3		
Level of Service	A			A			C				C		
Approach Delay (s)	6.5			5.6			29.2				26.3		
Approach LOS	A			A			C				C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	11.3											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43												
Actuated Cycle Length (s)	90.2											Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.3%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													

25: Tubman Avenue & Dundas Street E

Existing PM Model  
03-22-2023



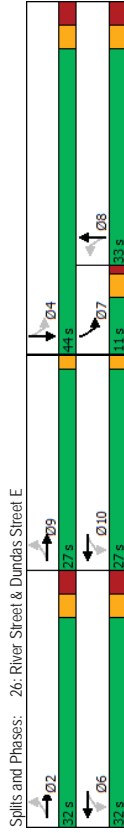
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	430	10	10	255	0	0	0	0	0	5	0
Traffic Volume (veh/h)	0	430	10	10	255	0	0	0	0	5	0	5
Future Volume (Veh/h)	0	430	10	10	255	0	0	0	0	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	0	453	11	11	268	0	0	0	0	5	0	5
Pedestrians	10			10			130			50		
Lane Width (m)	3.5			3.5			0.0			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	1			1			0			4		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	99			98								
pX platoon unblocked												
VC, conflicting volume	318			594			894		928	598	808	934
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	318			496			828		867	501	734	873
IC, single (s)	4.1			4.1			7.1		6.5	6.2	7.1	6.5
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5		4.0	3.3	3.5	4.0
p0 queue free %	100			99			100		100	100	98	100
CM capacity (veh/h)	1198			973			249		250	514	277	248
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	464	279	10									
Volume Left	0	11	5									
Volume Right	11	0	5									
cSH	1198	973	394									
Volume to Capacity	0.00	0.01	0.03									
Queue Length 95th (m)	0.0	0.3	0.6									
Control Delay (s)	0.0	0.5	14.4									
Lane LOS	A	A	B									
Approach Delay (s)	0.0	0.5	14.4									
Approach LOS	B	B	B									
Intersection Summary												
Average Delay				0.4								
Intersection Capacity Utilization				37.9%								A
Analysis Period (min)				15								
ICU Level of Service												

26: River Street & Dundas Street E

Existing PM Model  
03-22-2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	10	405	65	195	15	310	100	365				
Traffic Volume (vph)	10	405	65	195	15	310	100	365				
Future Volume (vph)	10	405	65	195	15	310	100	365				
Sign Control	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA				
Grade	2.9			6.10			8	7	4	2	6	9
Protected Phases	2	2	6	6	6	8	8	7	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)	21.0			21.0			6.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)	27.0			27.0			10.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	33.0			33.0			11.0	33.0	33.0	33.0	31.0	26.0
Total Split (%)	32.0%			32.0%			10.7%	32.0%	32.0%	31.0%	26.0%	26.0%
Yellow Time (s)	3.0			3.0			3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	3.0			3.0			3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)	-1.0			-1.0			-1.0	-1.0	-1.0	-1.0		
Total Lost Time (s)	5.0			5.0			5.0	5.0	5.0	5.0		
Lead-Lag	Lag			Lag			Lag	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes			Yes			Yes	Yes	Yes	Yes		
Recall Mode	Min			Min			Min	Min	Min	Min		
Act Effct Green (s)	29.3			29.3			28.9	29.3	29.3	29.3		
Actuated g/C Ratio	0.38			0.38			0.38	0.38	0.38	0.38		
v/c Ratio	0.69			0.66			0.05	0.86	0.34	0.56		
Control Delay	25.6			24.6			22.5	40.2	15.9	19.5		
Queue Delay	0.0			0.0			0.0	0.0	0.0	0.0		
Total Delay	25.6			24.6			22.5	40.2	15.9	19.5		
LOS	C			C			C	D	B	B		
Approach Delay	25.6			24.6			39.7	18.8				
Approach LOS	C			C			D	B				
Intersection Summary												
Cycle Length	103											
Actuated Cycle Length	77											
Natural Cycle	95											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	0.86											
Intersection Signal Delay	27.5											
Intersection Capacity Utilization	100.4%											
Analysis Period (min)	15											



Queues  
26: River Street & Dundas Street E

Existing PM Model  
03-22-2023

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	458	357	16	531	105	442
Lane Group Flow (vph)	0.69	0.66	0.05	0.86	0.34	0.56
v/c Ratio	25.6	24.6	22.5	40.2	15.9	19.5
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	25.6	24.6	22.5	40.2	15.9	19.5
Total Delay	55.9	40.5	1.4	64.6	6.7	37.7
Queue Length 50th (m)	82.4	64.5	7.8	#186.2	24.7	109.1
Queue Length 95th (m)	73.4	80.5		131.0		118.9
Internal Link Dist (m)		20.0		25.0		
Turn Bay Length (m)		723	587	292	616	308
Base Capacity (vph)	0	0	0	0	0	0
Stavation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.61	0.05	0.86	0.34	0.52

**Intersection Summary**  
# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
26: River Street & Dundas Street E

Existing PM Model  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	405	20	65	195	80	15	310	195	100	365	55
Future Volume (vph)	10	405	20	65	195	80	15	310	195	100	365	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.99	0.99	0.99	0.97	0.97	0.97	1.00	0.94	1.00	0.99	1.00	0.98
Frbp. psd/bikes	1.00	0.99	0.99	0.99	0.97	0.97	1.00	0.94	1.00	0.99	1.00	0.98
Frt	1.00	0.99	0.99	0.99	0.97	0.97	1.00	0.94	1.00	0.99	1.00	0.98
Flt Protected	1.00	0.99	0.99	0.99	0.97	0.97	1.00	0.94	1.00	0.99	1.00	0.98
Satd. Flow (prot)	1762	1638	1638	1638	1482	1482	1626	1626	1643	1643	1633	1633
Flt Permitted	0.99	0.99	0.99	0.85	0.85	0.85	0.51	1.00	0.19	0.19	1.00	1.00
Satd. Flow (perm)	1745	1745	1745	1402	1402	1402	790	1626	324	324	1633	1633
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	426	21	68	205	84	16	326	205	105	384	58
RTOR Reduction (vph)	0	2	0	0	13	0	0	19	0	0	4	0
Lane Group Flow (vph)	0	456	0	344	0	344	0	512	0	105	438	0
Confl. Peds. (#/hr)	55	75	75	75	75	75	55	75	75	75	75	5
Confl. Bikes (#/hr)	25	25	25	20	20	20	20	10	10	10	10	5
Heavy Vehicles (%)	9%	5%	0%	1%	9%	0%	5%	3%	0%	2%	12%	0%
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	pm+pl	NA	NA	NA
Protected Phases	2.9			6.10					7			4
Permitted Phases	2.9			6.10			8		8		4	4
Actuated Green, G (s)	33.9			33.9			27.8		27.8		37.2	37.2
Effective Green, g (s)	34.9			34.9			28.8		28.8		38.2	38.2
Actuated g/C Ratio	0.44			0.44			0.36		0.36		0.48	0.48
Clearance Time (s)							6.0		6.0		4.0	6.0
Vehicle Extension (s)							3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	769			618			287		592		263	788
v/s Ratio Prot							c0.31		c0.27		c0.27	c0.27
v/s Ratio Perm	c0.26			0.25			0.02		0.16		0.16	0.16
v/c Ratio	0.59			0.56			0.06		0.40		0.40	0.56
Uniform Delay, d1	16.7			16.4			16.3		13.9		14.5	14.5
Progression Factor	1.00			1.00			1.00		1.00		1.00	1.00
Incremental Delay, d2	1.2			1.1			0.1		12.5		1.0	0.9
Delay (s)	18.0			17.5			16.4		35.9		14.9	15.3
Level of Service	B			B			B		D		B	B
Approach Delay (s)	18.0			17.5			35.3		15.2		15.2	15.2
Approach LOS	B			B			D		D		B	B
Intersection Summary												
HCM 2000 Control Delay	22.0 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.75											
Actuated Cycle Length (s)	79.1											
Intersection Capacity Utilization	100.4%											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 27: Dreamer's Way & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
 29: Sumach Street & Site Driveway

Existing PM Model  
 03-22-2023

Existing PM Model  
 03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (veh/h)	830	0	0	410	0	0
Future Volume (Veh/h)	830	0	0	410	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	874	0	0	432	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)	90			162		
Upstream signal (m)	0.87			0.87		0.87
pX platoon unblocked	874			1090		437
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	570			817		70
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)	2.2			3.5		3.3
p0 queue free %	100			100		100
CM capacity (veh/h)	886			279		861
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volumes Total	583	291	144	288		
Volume Left	0	0	0	0		
Volume Right	0	0	0	0		
cSH	1700	1700	886	1700		
Volumes to Capacity	0.34	0.17	0.00	0.17		
Queue Length 95th (m)	0.0	0.0	0.0	0.0		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS						
Approach Delay (s)	0.0		0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		26.3%			ICU Level of Service	A
Analysis Period (min)		15				

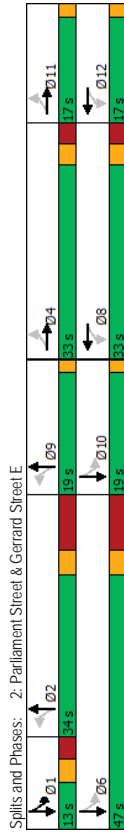
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑↑					↑↑
Traffic Volume (veh/h)	10	5	85	0	0	30
Future Volume (Veh/h)	10	5	85	0	0	30
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	5	89	0	0	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		None
Median type						
Median storage (veh)						
Upstream signal (m)						55
pX platoon unblocked						
VC, conflicting volume	121		89			89
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	121		89			89
IC, single (s)	6.4		6.2			4.1
IC, 2 stage (s)	3.5		3.3			2.2
p0 queue free %	99		99			100
CM capacity (veh/h)	879		975			1519
Direction, Lane #	WB 1	NB 1	SB 1			
Volumes Total	16	89	32			
Volume Left	11	0	0			
Volume Right	5	0	0			
cSH	907	1700	1519			
Volumes to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			14.5%		ICU Level of Service	A
Analysis Period (min)			15			

2032 Future Background AM Model (ExRN)  
 03-22-2023  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4↑	4↑	
Traffic Volume (veh/h)	0	0	5	550	500	60
Future Volume (Veh/h)	0	0	5	550	500	60
Sign Control	Free					
Grade	0%					
Peak Hour Factor	0.92					
Hourly flow rate (vph)	0	0	5	598	543	65
Pedestrians	80					
Lane Width (m)	3.5					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	39					
pX platoon unblocked	0.93					
VC, conflicting volume	970					
VC1, stage 1 conf vol	384					
VC2, stage 2 conf vol	688					
VCU, unblocked vol	822					
IC, single (s)	6.8					
IC, 2 stage (s)	3.5					
p0 queue free %	100					
CM capacity (veh/h)	292					
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volumes Total	204	399	362	246		
Volume Left	5	0	0	0		
Volume Right	0	0	0	65		
cSH	791	1700	1700	1700		
Volumes to Capacity	0.01	0.23	0.21	0.14		
Queue Length 95th (m)	0.1	0.0	0.0	0.0		
Control Delay (s)	0.3	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	0.1					
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.1					
Intersection Capacity Utilization	22.0%					
Analysis Period (min)	15					
ICU Level of Service	A					

2032 Future Background AM Model (ExRN)  
 03-22-2023  
 Timings  
 2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		4↑		4↑		4↑		4↑
Traffic Volume (vph)	25	245	65	520	80	330	80	350
Future Volume (vph)	25	245	65	520	80	330	80	350
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases	4 11							
Permitted Phases	4							
Detector Phase	4							
Switch Phase	4							
Minimum Initial (s)	6.0							
Minimum Split (s)	12.5							
Total Split (s)	13.0							
Total Split (%)	11.2%							
Yellow Time (s)	3.3							
All-Red Time (s)	3.2							
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead							
Recall Mode	Yes							
Ad Effct Green (s)	33.1							
Actuated g/C Ratio	0.36							
v/C Ratio	0.34							
Control Delay	21.0							
Queue Delay	0.0							
Total Delay	21.0							
LOS	C							
Approach Delay	21.0							
Approach LOS	C							
<b>Intersection Summary</b>								
Cycle Length	116							
Actuated Cycle Length	92.5							
Natural Cycle	115							
Control Type	Actuated-Uncoordinated							
Maximum v/C Ratio	0.80							
Intersection Signal Delay	25.3							
Intersection Capacity Utilization	99.9%							
Analysis Period (min)	15							





Timings  
2: Parliament Street & Gerrard Street E

2032 Future Background AM Model (ExRN)  
03-22-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	9	10	11	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	19.0	19.0	17.0	17.0
Total Split (s)	19.0	19.0	17.0	17.0
Total Split (%)	16%	16%	15%	15%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

Queues  
2: Parliament Street & Gerrard Street E

2032 Future Background AM Model (ExRN)  
03-22-2023



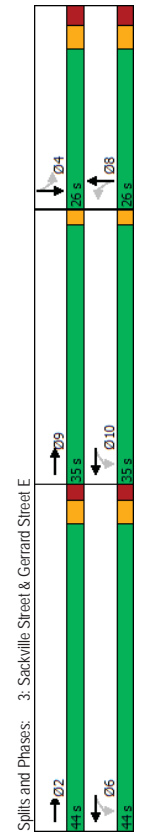
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	358	826	484	526
v/c Ratio	0.34	0.80	0.62	0.37
Control Delay	21.0	32.0	29.8	13.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.0	32.0	29.8	13.4
Queue Length 50th (m)	18.3	54.6	32.9	21.4
Queue Length 95th (m)	38.2	102.6	60.8	43.9
Internal Link Dist (m)	33.0	63.9	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1055	1078	798	1445
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	0.34	0.77	0.61	0.36
Intersection Summary				

2. Parliament Street & Gerrard Street E 2032 Future Background AM Model (ExRN) 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB
Traffic Volume (vph)	25	245	70	65	520	200	80	330	50	80	350	70
Future Volume (vph)	25	245	70	65	520	200	80	330	50	80	350	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Lane Util. 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
Fpb, ped/bikes	0.98	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd Flow (prot)	3321	3197	3171	3171	3171	3171	3171	3171	3171	3171	3171	3171
Flt Permitted	0.86	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Sat'd Flow (perm)	2877	2820	2381	2381	2381	2381	2381	2381	2381	2381	2381	2381
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	258	74	68	547	211	84	347	53	84	368	74
RTOR Reduction (vph)	0	20	0	0	29	0	0	7	0	0	13	0
Lane Group Flow (vph)	0	338	0	0	797	0	0	477	0	0	513	0
Conf. Bikes (#/hr)	80	85	85	80	85	80	85	120	120	120	85	85
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	Perm	MA	Perm	MA	Perm	MA	Perm	MA	Perm	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9
Permitted Phases	4 11	8 12	8 12	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9	2 9
Actuated Green, G (s)	37.6	37.6	37.6	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3
Effective Green, g (s)	38.6	38.6	38.6	41.3	41.3	41.3	41.3	41.3	41.3	41.3	41.3	41.3
Actuated g/C Ratio	0.41	0.41	0.41	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1166	1143	1032	1032	1032	1032	1032	1032	1032	1032	1032	1032
v/S Ratio Prot	0.12	c0.28	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio Perm	0.29	0.70	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
v/c Ratio	19.1	23.5	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.1	1.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Incremental Delay, d2	19.2	25.3	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Delay (s)	B	C	B	B	B	B	B	B	B	B	B	B
Level of Service	B	C	B	B	B	B	B	B	B	B	B	B
Approach Delay (s)	19.2	25.3	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Approach LOS	B	C	B	B	B	B	B	B	B	B	B	B
Intersection Summary												
HCM 2000 Control Delay	21.0 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	95.2 Sum of lost time (s)											
Intersection Capacity Utilization	99.9% ICU Level of Service F											
Analysis Period (min)	15											
c Critical Lane Group												

3. Sackville Street & Gerrard Street E 2032 Future Background AM Model (ExRN) 03-22-2023

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø6	Ø9	Ø10
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB
Traffic Volume (vph)	345	55	830	5	0	55	35			
Future Volume (vph)	345	55	830	5	0	55	35			
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA			
Protected Phases	2 9	6 10	6 10	8	4	2	6			
Permitted Phases	2 9	6 10	6 10	8	4	2	6			
Detector Phase	2	6	6	8	8	4	4			
Switch Phase										
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	16.0	16.0			
Minimum Split (s)	25.7	25.7	25.7	21.0	21.0	21.0	35.0			
Total Split (s)	26.0	26.0	26.0	26.0	26.0	44.0	35.0			
Total Spill (%)	24.8%	24.8%	24.8%	24.8%	24.8%	42%	33%			
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0			
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7	2.0	2.0			
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0			
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7			
Lead-Lag										
Lead-Lag Optimize?										
Recall Mode										
Act Effect Green (s)	44.7	44.7	44.7	22.9	22.9	22.9	22.9			
Actuated g/C Ratio	0.58	0.58	0.58	0.30	0.30	0.30	0.30			
v/c Ratio	0.21	0.55	0.07	0.07	0.29	0.29	0.29			
Control Delay	6.5	9.7	6.2	6.2	30.1	30.1	30.1			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	6.5	9.7	6.2	6.2	30.1	30.1	30.1			
LOS	A	A	A	A	A	C	C			
Approach Delay	6.5	9.7	6.2	6.2	30.1	30.1	30.1			
Approach LOS	A	A	A	A	A	C	C			
Intersection Summary										
Cycle Length: 105										
Actuated Cycle Length: 77.1										
Natural Cycle: 85										
Control Type: Actuated-Uncoordinated										
Maximum v/c Ratio: 0.55										
Intersection Signal Delay: 10.4										
Intersection Capacity Utilization: 65.1%										
Analysis Period (min): 15										



Queues 2032 Future Background AM Model (ExRN) 03-22-2023

3. Sackville Street & Gerrard Street E

	EBT	WBT	NBT	SBT
Lane Group	395	972	27	114
Lane Group Flow (vph)	0.21	0.55	0.07	0.29
v/c Ratio	6.5	9.7	6.2	30.1
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	6.5	9.7	6.2	30.1
Total Delay	11.5	37.5	0.0	15.5
Queue Length 50th (m)	16.4	48.7	4.5	34.0
Queue Length 95th (m)	139.8	47.8	34.3	15.3
Internal Link Dist (m)				
Turn Bay Length (m)	2313	2207	417	404
Base Capacity (vph)	0	0	0	0
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.44	0.06	0.28
Intersection Summary				

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN) 03-22-2023

3. Sackville Street & Gerrard Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4			4+4			4+4				4+4
Traffic Volume (vph)	0	345	15	55	830	0	5	0	20	55	35	15
Future Volume (vph)	0	345	15	55	830	0	5	0	20	55	35	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		4.0		4.0			4.7				4.7	
Lane Util. Factor		0.95		0.95			1.00				1.00	
Frbp. ped/bikes		0.99		1.00			0.86				0.99	
Frbp. ped/bikes		1.00		0.99			0.99				0.92	
Frt		0.99		1.00			0.89				0.98	
Frt Protected		1.00		1.00			0.99				0.97	
Sat'd. Flow (prot)		3215		3394			1410				1583	
Flt Permitted		1.00		0.90			0.96				0.85	
Sat'd. Flow (perm)		3215		3070			1366				1375	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	379	16	60	912	0	5	0	22	60	38	16
RTOR Reduction (vph)	0	4	0	0	0	0	0	19	0	0	5	0
Lane Group Flow (vph)	0	391	0	0	972	0	0	8	0	0	109	0
Confl. Peds. (#/hr)	40	60	60	60	40	60	140	140	60	140	60	60
Confl. Bikes (#/hr)		15		75			75				15	
Heavy Vehicles (%)	0%	10%	0%	9%	4%	0%	0%	0%	0%	0%	6%	6%
Turn Type	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA
Protected Phases	2.9			6.10			8				4	
Permitted Phases				6.10			8				4	
Actuated Green, G (s)	48.0			48.0			21.8				21.8	
Effective Green, g (s)	49.0			49.0			22.8				22.8	
Actuated g/C Ratio	0.63			0.63			0.29				0.29	
Clearance Time (s)							5.7				5.7	
Vehicle Extension (s)							3.0				3.0	
Lane Grp Cap (vph)	2032			1941			401				404	
v/s Ratio Prot	0.12											
v/s Ratio Perm				0.32			0.01				0.08	
v/c Ratio	0.19			0.50			0.02				0.27	
Uniform Delay, d1	6.0			7.7			19.4				21.0	
Progression Factor	1.00			1.00			1.00				1.00	
Incremental Delay, d2	0.0			0.2			0.0				0.4	
Delay (s)	6.0			7.9			19.4				21.3	
Level of Service	A			A			B				C	
Approach Delay (s)	6.0			7.9			19.4				21.3	
Approach LOS	A			A			B				C	
Intersection Summary												
HCM 2000 Control Delay	8.6 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	77.5 Sum of lost time (s) 9.7											
Intersection Capacity Utilization	65.1% ICU Level of Service C											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 4: Gerrard Street E & Gifford Street

03-22-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	1↑		W	
Traffic Volume (veh/h)	5	415	880	20	5	5
Future Volume (Veh/h)	5	415	880	20	5	5
Sign Control		Free	Free	Free	Stop	Stop
Grade		0%	0%	0%	0%	0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	432	917	21	5	5
Pedestrians		5	5		50	
Lane Width (m)		3.5	3.5	3.0		
Walking Speed (m/s)		1.1	1.1	1.1		
Percent Blockage		0	0		4	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
PX platoon unblocked	0.93				0.94	0.93
VC conflicting volume	988				1208	524
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	825				963	323
IC single (s)	4.1				7.5	7.3
IC 2 stage (s)						
p0 queue free %	2.2				3.8	3.5
IF (s)	99				97	99
CM capacity (veh/h)	725				182	551
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volumes Total	149	288	611	327	10	10
Volume Left	5	0	0	0	5	5
Volume Right	0	0	0	21	5	5
cSH	725	1700	1700	1700	274	274
Volumes to Capacity	0.01	0.17	0.36	0.19	0.04	0.04
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.9	0.9
Control Delay (s)	0.4	0.0	0.0	0.0	18.6	18.6
Lane LOS	A				C	C
Approach Delay (s)	0.1		0.0		18.6	
Approach LOS					C	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			36.6%		ICU Level of Service A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 5: Gerrard Street E & Nasmith Avenue

03-22-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	1↑		W	
Traffic Volume (veh/h)	5	415	890	5	15	10
Future Volume (Veh/h)	5	415	890	5	15	10
Sign Control		Free	Free	Free	Stop	Stop
Grade		0%	0%	0%	0%	0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	428	918	5	15	10
Pedestrians					75	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					6	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
PX platoon unblocked	0.90				0.90	0.90
VC conflicting volume	998				1220	536
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	769				1016	255
IC single (s)	4.1				6.9	7.1
IC 2 stage (s)						
p0 queue free %	2.2				3.6	3.4
IF (s)	99				92	98
CM capacity (veh/h)	723				190	610
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volumes Total	148	285	612	311	25	25
Volume Left	5	0	0	0	15	15
Volume Right	0	0	0	5	10	10
cSH	723	1700	1700	1700	262	262
Volumes to Capacity	0.01	0.17	0.36	0.18	0.10	0.10
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.4	2.4
Control Delay (s)	0.4	0.0	0.0	0.0	20.2	20.2
Lane LOS	A				C	C
Approach Delay (s)	0.1		0.0		20.2	
Approach LOS					C	
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			34.8%		ICU Level of Service A	
Analysis Period (min)			15			

Timings 2032 Future Background AM Model (ExRN) 03-22-2023

Queues 2032 Future Background AM Model (ExRN) 03-22-2023

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations									
Traffic Volume (vph)	5	410	55	860	10				
Future Volume (vph)	5	410	55	860	10				
Turn Type	Perm	NA	Perm	NA	NA				
Protected Phases	2,9		6,10	8	2	6	9	10	
Permitted Phases	2,9		6,10	8					
Detector Phase	2	2	6	6	8				
Switch Phase									
Minimum Initial (s)					15.0	11.0	11.0	5.0	5.0
Minimum Split (s)					25.4	26.2	26.2	72.0	72.0
Total Split (s)					27.0	43.0	43.0	72.0	72.0
Total Split (%)					19.0%	30%	30%	51%	51%
Yellow Time (s)					3.0	3.0	3.0	2.0	2.0
All-Red Time (s)					7.4	7.2	7.2	0.0	0.0
Lost Time Adjust (s)					-1.0				
Total Lost Time (s)					9.4				
Lead/Lag									
Lead-Lag Optimize?					None	Min	Min	None	None
Recall Mode					None				
Act Effct Green (s)		73.1		73.1	18.4				
Actuated g/C Ratio		0.73		0.73	0.18				
v/c Ratio		0.22		0.57	0.26				
Control Delay		6.2		9.6	45.1				
Queue Delay		0.0		0.1	0.0				
Total Delay		6.2		9.7	45.1				
LOS		A		A	D				
Approach Delay		6.2		9.7	45.1				
Approach LOS		A		A	D				

6: Summach Street & Gerrard Street E

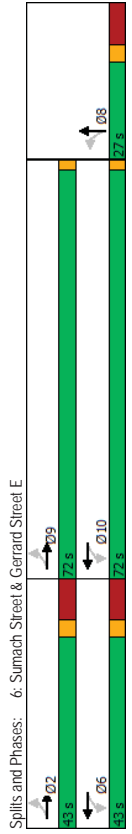
Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	494	1196	68
v/c Ratio	0.22	0.57	0.26
Control Delay	6.2	9.6	45.1
Queue Delay	0.0	0.1	0.0
Total Delay	6.2	9.7	45.1
Queue Length 50th (m)	18.3	63.6	7.4
Queue Length 95th (m)	24.0	76.9	29.4
Internal Link Dist (m)	44.0	75.7	33.2
Turn Bay Length (m)			
Base Capacity (vph)	2293	2086	287
Starvation Cap Reductn	0	176	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.63	0.24

Intersection Summary

Cycle Length: 142
Actuated Cycle Length: 100.1
Natural Cycle: 125
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 10.1
Intersection Capacity Utilization 78.9%
Analysis Period (min) 15

Intersection Summary

EBT	WBT	NBT
494	1196	68
0.22	0.57	0.26
6.2	9.6	45.1
0.0	0.1	0.0
6.2	9.7	45.1
18.3	63.6	7.4
24.0	76.9	29.4
44.0	75.7	33.2
2293	2086	287
0	176	0
0	0	0
0	0	0
0.22	0.63	0.24





6: Sumach Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 03-22-2023

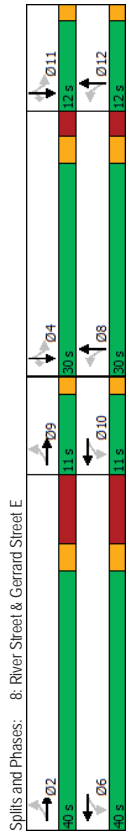
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T			4					
Traffic Volume (vph)	5	410	15	55	860	125	35	10	15	0	0	0
Future Volume (vph)	5	410	15	55	860	125	35	10	15	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp. ped/bikes	0.99			0.97			0.96					
Frbp. ped/bikes	1.00			0.99			0.88					
Frt	0.99			0.98			0.97					
FIL Protected	1.00			1.00			0.97					
Sat'd. Flow (prot)	3352			3251			1492					
FIL Permitted	0.94			0.88			0.97					
Sat'd. Flow (perm)	3148			2882			1492					
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	471	17	63	989	144	40	11	17	0	0	0
RTOR Reduction (vph)	0	2	0	0	7	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	492	0	0	1189	0	0	59	0	0	0	0
Conf. Bikes (#/hr)	65	85	85	65	100	65	100	65	65	65	100	100
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perim	MA	Perm	NA	Perm	NA	Perim	NA	Perim	NA	Perim	NA
Protected Phases	2.9			6.10			8					
Permitted Phases	2.9			6.10			8					
Effective Green, G (s)	78.6			78.6			11.8					
Actuated Green, g (s)	79.6			79.6			12.8					
Actuated g/C Ratio	0.77			0.77			0.12					
Clearance Time (s)							10.4					
Vehicle Extension (s)							3.0					
Lane Grp Cap (vph)	2437			2231			185					
v/s Ratio Prot												
v/s Ratio Perm	0.16			0.41			0.04					
v/c Ratio	0.20			0.53			0.32					
Uniform Delay, d1	3.1			4.5			41.0					
Progression Factor	1.00			1.00			1.00					
Incremental Delay, d2	0.0			0.2			1.0					
Delay (s)	3.1			4.7			42.0					
Level of Service	A			A			D					
Approach Delay (s)	3.1			4.7			42.0					0.0
Approach LOS	A			A			D					A
Intersection Summary												
HCM 2000 Control Delay	5.7 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.55											
Actuated Cycle Length (s)	102.8 Sum of lost time (s)											
Intersection Capacity Utilization	78.9% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

7: Gerrard Street E & Sword Street  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR
Lane Configurations		4T		4T			W	
Traffic Volume (veh/h)	0	425	1035	0	10	5		
Future Volume (Veh/h)	0	425	1035	0	10	5		
Sign Control	Free	Free	Free	Free	Free	Stop		
Grade	0%	0%	0%	0%	0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	447	1089	0	11	5		
Pedestrians							75	
Lane Width (m)							3.0	
Walking Speed (m/s)							1.1	
Percent Blockage							6	
Right turn flare (veh)								
Median type		None		None				
Median storage (veh)								
Upstream signal (m)		100		91				
pX platoon unblocked	0.80						0.80	0.80
vC, conflicting volume	1164						1388	620
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	696						928	13
IC, single (s)	4.1						6.8	6.9
IC, 2 stage (s)								
IF (s)	2.2						3.5	3.3
p0 queue free %	100						95	99
dM capacity (veh/h)	683						205	804
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1		
Volumes Total	224	224	544	544	16	16		
Volume Left	0	0	0	0	0	0		
Volume Right	0	0	0	0	0	0		
CSH	1700	1700	1700	1700	267	267		
Volumes to Capacity	0.13	0.13	0.32	0.32	0.06	0.06		
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.4	1.4		
Control Delay (s)	0.0	0.0	0.0	0.0	19.3	19.3		
Lane LOS					C	C		
Approach Delay (s)	0.0				19.3			
Approach LOS					C			
Intersection Summary								
Average Delay	0.2							
Intersection Capacity Utilization	38.6%							
ICU Level of Service	A							
Analysis Period (min)	15							

Timings 2032 Future Background AM Model (ExRN) 03-22-2023  
8: River Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	110	280	150	825	45	365	125	365	165			
Future Volume (vph)	110	280	150	825	45	365	125	365	165			
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	2.9	6.10	6.10	8.12	4.11	4.11	4.11	4.11	4.11	2	4	6
Permitted Phases	2	2	6	6	8	8	4	4	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)										23.0	19.0	23.0
Minimum Split (s)										33.8	30.0	33.8
Total Split (s)										40.0	30.0	40.0
Total Split (%)										43%	32%	43%
Yellow Time (s)										3.0	3.0	3.0
All-Red Time (s)										7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode										Min	Min	Min
Act Effct Green (s)	36.8	36.8	29.9	29.9	29.9	29.9	29.9	29.9	29.9			
Actuated g/C Ratio	0.45	0.45	0.37	0.37	0.37	0.37	0.37	0.37	0.37			
v/C Ratio	0.59	1.01	0.19	0.70	0.63	0.56	0.29					
Control Delay	21.1	53.3	20.8	28.3	37.4	24.6	8.6					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	21.1	53.3	20.8	28.3	37.4	24.6	8.6					
LOS	C	D	C	C	D	C	C	A				
Approach Delay	21.1	53.3	27.6	23.0								
Approach LOS	C	D	C	C								
Intersection Summary												
Cycle Length	93											
Actuated Cycle Length	81.9											
Natural Cycle	90											
Control Type	Actuated-Uncoordinated											
Maximum v/C Ratio	1.01											
Intersection Signal Delay	36.4											
Intersection Capacity Utilization	117.2%											
Analysis Period (min)	15											



Timings 2032 Future Background AM Model (ExRN) 03-22-2023  
8: River Street & Gerrard Street E

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Split (s)	30.0	11.0	11.0	12.0	12.0
Total Split (s)	30.0	11.0	11.0	12.0	12.0
Total Split (%)	32%	12%	12%	13%	13%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues 2032 Future Background AM Model (ExRN) 03-22-2023  
8: River Street & Gerrard Street E

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	454	1203	47	448	130	380	172
Lane Group Flow (vph)	0.59	1.01	0.19	0.70	0.63	0.56	0.29
v/c Ratio	21.1	53.3	20.8	28.3	37.4	24.6	8.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	21.1	53.3	20.8	28.3	37.4	24.6	8.6
Total Delay	27.3	99.5	5.4	61.8	17.8	50.4	6.3
Queue Length 50th (m)	46.6	#160.8	13.2	94.4	38.6	76.7	19.2
Queue Length 95th (m)	67.0	81.6		126.5		61.7	
Internal Link Dist (m)			30.0		30.0		
Turn Bay Length (m)	735	1188	252	670	216	708	609
Base Capacity (vph)	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.01	0.19	0.67	0.60	0.54	0.28

**Intersection Summary**  
# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN) 03-22-2023  
8: River Street & Gerrard Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4TB			4TB		
Traffic Volume (vph)	110	280	45	150	825	180	45	365	65	125	365	165
Future Volume (vph)	110	280	45	150	825	180	45	365	65	125	365	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Lane Util. 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
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frt Protected	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Satd. Flow (prot)	3180	3180	3180	3180	3180	3180	3180	3180	3180	3180	3180	3180
Frt Permitted	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Satd. Flow (perm)	1684	1684	1684	1684	1684	1684	1684	1684	1684	1684	1684	1684
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	115	292	47	156	859	188	47	380	68	130	380	172
RTOR Reduction (vph)	0	8	0	0	13	0	0	7	0	0	0	67
Lane Group Flow (vph)	0	446	0	0	1190	0	47	441	0	130	380	105
Confl. Peds. (#/hr)	50	95	95	95	95	50	40	85	85	40	15	10
Heavy Vehicles (%)	4%	8%	4%	0%	3%	1%	8%	4%	2%	3%	1%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2.9	2.9	2.9	6.10	6.10	6.10	8.12	8.12	8.12	8.12	4.11	4.11
Permitted Phases	2.9	2.9	2.9	6.10	6.10	6.10	8.12	8.12	8.12	8.12	4.11	4.11
Actuated Green, G (s)	45.5	45.5	45.5	45.5	45.5	45.5	33.8	33.8	33.8	33.8	33.8	33.8
Effective Green, g (s)	46.5	46.5	46.5	46.5	46.5	46.5	34.8	34.8	34.8	34.8	34.8	34.8
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56	0.56	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	940	940	940	1460	1460	1460	277	727	238	777	593	593
v/s Ratio Prot							0.25				0.20	
v/s Ratio Perm	0.27	0.27	0.27	0.45	0.45	0.45	0.07	0.07	0.23	0.23	0.07	0.07
v/c Ratio	0.47	0.47	0.47	0.82	0.82	0.82	0.17	0.61	0.55	0.49	0.18	0.18
Uniform Delay, d1	11.1	11.1	11.1	14.9	14.9	14.9	15.2	18.9	18.3	17.7	15.2	15.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.4	3.6	3.6	3.6	0.3	1.4	2.6	0.5	0.1	0.1
Delay (s)	11.4	11.4	11.4	18.5	18.5	18.5	15.5	20.4	20.8	18.2	15.4	15.4
Level of Service	B	B	B	B	B	B	C	C	C	B	B	B
Approach Delay (s)	11.4	11.4	11.4	18.5	18.5	18.5	19.9		18.0			
Approach LOS	B	B	B	B	B	B	B		B			
<b>Intersection Summary</b>												
HCM 2000 Control Delay		17.5			HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		83.3			Sum of lost time (s)				16.8			
Intersection Capacity Utilization		117.2%			ICU Level of Service				H			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 9: Sackville Street & Site Driveway

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	5	5	5	5	0	15	5	10	90	5
Future Volume (Veh/h)	5	5	5	5	5	5	0	15	5	10	90	5
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	6	6	6	6	6	6	0	19	6	13	117	6
Pedestrians	70			40			15				10	
Lane Width (m)	3.5			3.5			3.5				3.5	
Walking Speed (m/s)	1.1			1.1			1.1				1.1	
Percent Blockage	6			4			1				1	
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	257	281	205	232	281	72	193					65
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	257	281	205	232	281	72	193					65
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	99	99	99	99	99	99	100					99
CM capacity (veh/h)	591	566	778	628	566	952	1306					1495
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	18	18	25	136								
Volume Left	6	6	0	13								
Volume Right	6	6	6	6								
cSH	632	680	1306	1495								
Volumes to Capacity	0.03	0.03	0.00	0.01								
Queue Length 95th (m)	0.7	0.6	0.0	0.2								
Control Delay (s)	10.9	10.4	0.0	0.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.9	10.4	0.0	0.8								
Approach LOS	B	B	A	A								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			27.2%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 10: Parliament Street & Oak Street

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	65	395	10	15	470
Future Volume (Veh/h)	45	65	395	10	15	470
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	68	416	11	16	495
Pedestrians	260		5			175
Lane Width (m)	3.0		3.5			3.5
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	20		0			15
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			151			143
pX platoon unblocked	0.99	0.99			0.99	
VC, conflicting volume	966	648			687	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	894	627			666	
IC, single (s)	6.8	7.0			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	79	76			98	
CM capacity (veh/h)	219	282			742	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	115	277	150	181	330	
Volume Left	47	0	0	16	0	
Volume Right	68	0	11	0	0	
cSH	252	1700	1700	742	1700	
Volumes to Capacity	0.46	0.16	0.09	0.02	0.19	
Queue Length 95th (m)	16.9	0.0	0.0	0.5	0.0	
Control Delay (s)	30.7	0.0	0.0	1.1	0.0	
Lane LOS	D	A	A	A	A	
Approach Delay (s)	30.7	0.0	0.0	0.4	0.0	
Approach LOS	D	A	A	A	A	
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			43.8%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 11: Oak Street & Dreamer's Way

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	25	65	0	5	50
Future Volume (Veh/h)	0	25	65	0	5	50
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	30	79	0	6	61
Pedestrians	15				40	
Lane Width (m)	3.5	3.5	3.0	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume	119				149	134
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	119				149	134
IC single (s)	4.1				6.4	6.3
IC 2 stage (s)	2.2				3.5	3.4
p0 queue free %	100				99	93
CM capacity (veh/h)	1437				822	851
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	30	79	67			
Volume Left	0	0	6			
Volume Right	0	0	61			
CSH	1700	1700	848			
Volumes to Capacity	0.02	0.05	0.08			
Queue Length 95th (m)	0.0	0.0	2.0			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			26.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 12: Regent Street & Oak Street

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	30	0	0	35	30	25
Future Volume (Veh/h)	30	0	0	35	30	25
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	38	0	0	45	38	32
Pedestrians	15			10	30	
Lane Width (m)	3.5	3.5	3.0	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	1			1	2	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume			68		128	78
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol			68		128	78
IC single (s)			4.1		6.4	6.2
IC 2 stage (s)			2.2		3.5	3.3
p0 queue free %			100		95	97
CM capacity (veh/h)			1511		831	947
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	38	45	70			
Volume Left	0	0	38			
Volume Right	0	0	32			
CSH	1700	1700	880			
Volumes to Capacity	0.02	0.03	0.08			
Queue Length 95th (m)	0.0	0.0	2.0			
Control Delay (s)	0.0	0.0	9.4			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.4			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			26.9%		ICU Level of Service	A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
13: Oak Street & Site Driveway

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	50	30	0	0	5
Future Volume (Veh/h)	5	50	30	0	0	5
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	7	70	42	0	0	7
Pedestrians			110		25	
Lane Width (m)			3.5		3.0	
Walking Speed (m/s)			1.1		1.1	
Percent Blockage			10		2	
Right turn flare (veh)			None		None	
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	67				261	67
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	67				261	67
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
CM capacity (veh/h)	1518				646	983
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	77	42	7			
Volume Left	7	0	0			
Volume Right	0	0	7			
cSH	1518	1700	983			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	0.7	0.0	8.7			
Lane LOS	A	A	A			
Approach Delay (s)	0.7	0.0	8.7			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			19.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
14: Sackville Street & Oak Street

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	15	25	10	0	20	5
Future Volume (vph)	15	25	10	0	20	5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	19	31	12	0	25	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	62	31	117			
Volume Left (vph)	19	0	12			
Volume Right (vph)	12	6	6			
Head (s)	0.02	-0.05	0.07			
Departure Headway (s)	4.2	4.2	4.2			
Degree Utilization, x	0.07	0.04	0.14			
Capacity (veh/h)	827	832	836			
Control Delay (s)	7.5	7.3	7.8			
Approach Delay (s)	7.5	7.3	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A		ICU Level of Service	A
Intersection Capacity Utilization			32.4%			
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 15: Sumach Street & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	5	20	10	0	0	0	25	55	35	5	60	0
Future Volume (vph)	5	20	10	0	0	0	25	55	35	5	60	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	7	27	13	0	0	0	33	73	47	7	80	0
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total (vph)	47	153	87									
Volume Left (vph)	7	33	7									
Volume Right (vph)	13	47	0									
Head (s)		-0.07	-0.04									
Departure Headway (s)		4.3	4.1									
Degree Utilization, x		0.06	0.17									
Capacity (veh/h)		782	865									
Control Delay (s)		7.6	7.9									
Approach Delay (s)		7.6	7.9									
Approach LOS		A	A									
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			30.6%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 16: Tubman Avenue & Oak Street

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	Free	Free	Free	Free	Stop	Stop
Traffic Volume (veh/h)	60	0	0	0	0	0
Future Volume (Veh/h)	60	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	80	0	0	0	0	0
Pedestrians	40	0	0	0	0	0
Lane Width (m)	3.5	0.0	0.0	0.0	0.0	0.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	4	0	0	0	0	0
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
PK, platoon unblocked						
VC, conflicting volume		125			165	135
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol		125			165	135
IC, single (s)		4.1			6.4	6.7
IC, 2 stage (s)						
p0 queue free %		100			3.5	3.8
ICF (s)		2.2			3.5	3.8
p0 capacity (veh/h)		1474			801	800
Direction, Lane #	EB 1					
Volume Total	80					
Volume Left	0					
Volume Right	0					
CSH	1700					
Volume to Capacity	0.05					
Queue Length 95th (m)	0.0					
Control Delay (s)	0.0					
Lane LOS						
Approach Delay (s)	0.0					
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			23.9%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 17: Oak Street & Site Driveway

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4			5	0
Traffic Volume (veh/h)	5	55	0	0	5	0
Future Volume (Veh/h)	5	55	0	0	5	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	61	0	0	6	0
Pedestrians			10		10	
Lane Width (m)			0.0		3.0	
Walking Speed (m/s)			1.1		1.1	
Percent Blockage			0		1	
Right turn flare (veh)			None		None	
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					93	10
VC, conflicting volume	10					
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	10				93	10
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
CM capacity (veh/h)	1610				902	1069
Direction, Lane #	EB 1	SB 1				
Volumes Total	67	6				
Volume Left	6	6				
Volume Right	0	0				
cSH	1610	902				
Volumes to Capacity	0.00	0.01				
Queue Length 95th (m)	0.1	0.2				
Control Delay (s)	0.7	9.0				
Lane LOS	A	A				
Approach Delay (s)	0.7	9.0				
Approach LOS	A	A				
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		17.0%			ICU Level of Service	A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 18: River Street & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4		4							4
Traffic Volume (veh/h)	40	0	20	35	0	65	0	370	25	40	520
Future Volume (Veh/h)	40	0	20	35	0	65	0	370	25	40	520
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	44	0	22	38	0	71	0	407	27	44	571
Pedestrians		75		65		35		35		5	
Lane Width (m)		3.5		3.5		3.5		3.5		3.5	
Walking Speed (m/s)		1.1		1.1		1.1		1.1		1.1	
Percent Blockage		7		6		3		3		0	
Right turn flare (veh)											
Median type											
Median storage (veh)											
Upstream signal (m)								143			151
pX platoon unblocked	0.87	0.87	0.85	0.87	0.87	0.79	0.85			0.79	
VC, conflicting volume	1230	1233	681	1202	1220	490	646			499	
VC1, stage 1 conf vol											
VC2, stage 2 conf vol											
VCu, unblocked vol	797	800	536	764	784	223	494			234	
IC, single (s)	7.2	6.5	6.2	7.1	7.0	6.2	4.1			4.1	
IC, 2 stage (s)											
IF (s)	3.6	4.0	3.3	3.5	4.5	3.3	2.2			2.2	
p0 queue free %	76	100	95	82	100	88	100			96	
CM capacity (veh/h)	184	234	422	209	200	606	856			1003	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1							
Volumes Total	66	109	434	615							
Volume Left	44	38	0	44							
Volume Right	22	71	27	0							
cSH	227	364	1700	1003							
Volumes to Capacity	0.29	0.30	0.26	0.04							
Queue Length 95th (m)	8.8	9.4	0.0	1.0							
Control Delay (s)	27.3	19.0	0.0	1.2							
Lane LOS	D	C	A	A							
Approach Delay (s)	27.3	19.0	0.0	1.2							
Approach LOS	D	C	C	C							
Intersection Summary											
Average Delay			3.8								
Intersection Capacity Utilization			72.3%			ICU Level of Service				C	
Analysis Period (min)			15								

19: Parliament Street & Cole Street

03-22-2023

2032 Future Background AM Model (ExRN)

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			←	←	←	←
Traffic Volume (veh/h)	0	0	405	20	25	490
Future Volume (Veh/h)	0	0	405	20	25	490
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	440	22	27	533
Pedestrians	250	10				15
Lane Width (m)	0.0	3.5	3.5			3.5
Walking Speed (m/s)	1.1	1.1	1.1			1.1
Percent Blockage	0	1				1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.94	0.94		0.94		
VC1, conflicting volume	1032	496				712
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	902	331				562
IC, single (s)	6.8	6.9				4.2
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IF (s)	100	100				97
CM capacity (veh/h)	254	621				931
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volumes Total	293	169	205	355		
Volume Left	0	0	27	0		
Volume Right	0	22	0	0		
cSH	1700	1700	931	1700		
Volumes to Capacity	0.17	0.10	0.03	0.21		
Queue Length 95th (m)	0.0	0.0	0.7	0.0		
Control Delay (s)	0.0	0.0	1.4	0.0		
Lane LOS			A			
Approach Delay (s)	0.0		0.5			
Approach LOS						
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	44.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

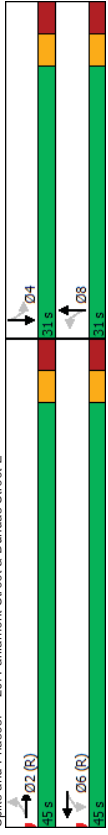
20: Parliament Street & Dundas Street E

03-22-2023

2032 Future Background AM Model (ExRN)

03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	←	←	←	←	←	←	←
Traffic Volume (vph)	35	300	35	335	40	310	60	390
Future Volume (vph)	35	300	35	335	40	310	60	390
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4	
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	45.0	45.0	45.0	45.0	31.0	31.0	31.0	31.0
Total Split (%)	59.2%	59.2%	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)								
Lead-Lag	5.0		5.0		5.0		5.0	
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.4	41.4	41.4	41.4	24.6	24.6	24.6	24.6
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.32	0.32	0.32	0.32
v/c Ratio	0.25	0.25	0.31	0.31	0.45	0.45	0.57	0.57
Control Delay	9.5	12.9	21.8	21.8	23.5	23.5	23.5	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	12.9	21.8	21.8	23.5	23.5	23.5	23.5
LOS	A	B	B	B	C	C	C	C
Approach Delay	9.5		12.9		21.8		23.5	
Approach LOS	A		B		C		C	
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 54 (7%), Referenced to phase 2EBTL and 6:WBT, Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.57								
Intersection Signal Delay: 17.2								
Intersection Capacity Utilization 91.4%								
ICU Level of Service F								
Analysis Period (min) 15								



20: Parliament Street & Dundas Street E



	EBT	WBT	NBT	SBT
Lane Group	383	478	389	522
Lane Group Flow (vph)	0.25	0.31	0.45	0.57
v/c Ratio	9.5	12.9	21.8	23.5
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	9.5	12.9	21.8	23.5
Total Delay	13.2	26.5	22.8	31.8
Queue Length 50th (m)	22.7	35.4	32.6	43.7
Queue Length 95th (m)	85.0	103.5	45.0	56.1
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1539	1559	919	971
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	0.25	0.31	0.42	0.54
<b>Intersection Summary</b>				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4TB			4TB			4TB					
Traffic Volume (vph)	35	300	25	35	335	80	40	310	15	60	390	40	
Future Volume (vph)	35	300	25	35	335	80	40	310	15	60	390	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. 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	
Frbp. ped/bikes	0.99	0.99	0.99	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Frbp. psd/bikes	0.99	0.99	1.00	1.00	0.99	1.00	0.99	0.99	0.99	0.99	0.99	0.99	
Frt	0.99	0.99	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Flt Protected	1.00	1.00	1.00	1.00	0.99	1.00	0.99	0.99	0.99	0.99	0.99	0.99	
Satd. Flow (prot)	3167	3100	3100	3100	3112	3112	3112	3112	3112	3112	3112	3112	
Flt Permitted	0.88	0.88	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	
Satd. Flow (perm)	2800	2800	2806	2806	2654	2654	2654	2654	2654	2654	2787	2787	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	37	319	27	37	356	85	43	330	16	64	415	43	
RTOR Reduction (vph)	0	7	0	0	23	0	0	4	0	0	9	0	
Lane Group Flow (vph)	0	376	0	0	455	0	0	385	0	0	513	0	
Confl. Peds. (#/hr)	155	110	110	110	155	140	155	140	160	160	140	140	
Confl. Bikes (#/hr)	10	10	10	10	25	25	25	25	25	25	25	25	
Heavy Vehicles (%)	6%	10%	4%	22%	5%	13%	18%	11%	13%	2%	5%	5%	
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Permitted Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Actuated Green, G (s)	40.4	40.4	40.4	40.4	40.4	40.4	23.6	23.6	23.6	23.6	23.6	23.6	
Effective Green, g (s)	41.4	41.4	41.4	41.4	41.4	41.4	24.6	24.6	24.6	24.6	24.6	24.6	
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.32	0.32	0.32	0.32	0.32	0.32	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1525	1525	1528	1528	859	859	859	859	859	859	902	902	
v/s Ratio Prot	0.13	0.13	0.16	0.16	0.15	0.15	0.18	0.18	0.18	0.18	0.18	0.18	
v/c Ratio Perm	0.25	0.25	0.30	0.30	0.45	0.45	0.57	0.57	0.57	0.57	0.57	0.57	
Uniform Delay, d1	9.1	9.1	9.4	9.4	20.3	20.3	21.3	21.3	21.3	21.3	21.3	21.3	
Progression Factor	1.00	1.00	1.42	1.42	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4	0.5	0.5	0.4	0.4	0.8	0.8	0.8	0.8	0.8	0.8	
Delay (s)	9.5	9.5	13.9	13.9	20.7	20.7	22.1	22.1	22.1	22.1	22.1	22.1	
Level of Service	A	A	B	B	C	C	C	C	C	C	C	C	
Approach Delay (s)	9.5	9.5	13.9	13.9	20.7	20.7	22.1	22.1	22.1	22.1	22.1	22.1	
Approach LOS	A	A	B	B	C	C	C	C	C	C	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	16.9											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	91.4%											ICU Level of Service	F
Analysis Period (min)	15												
c Critical Lane Group													



21: Regent Street & Dundas Street E

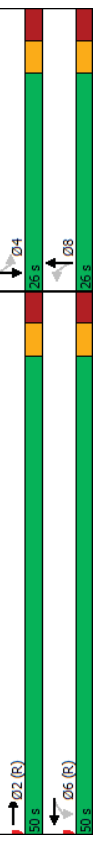
2032 Future Background AM Model (ExRN)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T				4T			4T	
Traffic Volume (veh/h)	10	370	10	10	425	35	15	10	5	20	10	20
Future Volume (Veh/h)	10	370	10	10	425	35	15	10	5	20	10	20
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	402	11	11	462	38	16	11	5	22	11	22
Pedestrians	20			5			70				80	
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2			0			6				7	
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)	127			124								
pX platoon unblocked												
VC, conflicting volume	580		483				800	1102	282	822	1088	350
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	580		483				800	1102	282	822	1088	350
IC, single (s)	4.1		4.1				7.6	6.7	6.9	7.6	6.5	7.1
IC, 2 stage (s)	2.2		2.2				3.6	4.1	3.3	3.5	4.0	3.4
p0 queue free %	99		99				92	93	99	89	94	96
CM capacity (veh/h)	933		1023				201	168	674	202	185	569
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 1					
Volume Total	212	212	242	269	32	55						
Volume Left	11	0	11	0	16	22						
Volume Right	0	11	0	38	5	22						
cSH	933	1700	1023	1700	210	266						
Volumes to Capacity	0.01	0.12	0.01	0.16	0.15	0.21						
Queue Length 95th (m)	0.3	0.0	0.2	0.0	4.0	5.8						
Control Delay (s)	0.6	0.0	0.5	0.0	25.2	22.0						
Lane LOS	A	A	A	D	C	C						
Approach Delay (s)	0.3		0.2		25.2	22.0						
Approach LOS	D		D		C	C						
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	35.7%											
ICU Level of Service	A											
Analysis Period (min)	15											

22: Sackville Street & Dundas Street E

2032 Future Background AM Model (ExRN)

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4T		4T		4T		4T
Traffic Volume (vph)	405	10	400	45	0	35	50
Future Volume (vph)	405	10	400	45	0	35	50
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4
Permitted Phases	2	6	6	6	8	8	4
Detector Phase	2	6	6	6	8	8	4
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	17.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Ad Effct Green (s)	47.6	47.6	47.6	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.24	0.24	0.24	0.24
v/C Ratio	0.22	0.40	0.40	0.22	0.22	0.32	0.32
Control Delay	6.6	5.6	5.6	12.9	20.2	20.2	20.2
Queue Delay	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Total Delay	6.6	5.9	5.9	12.9	20.2	20.2	20.2
LOS	A	A	A	B	B	C	C
Approach Delay	6.6	5.9	5.9	12.9	20.2	20.2	20.2
Approach LOS	A	A	A	B	B	C	C
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: T1 (14%), Referenced to phase 2EBT and 6,WBTL Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/C Ratio: 0.40							
Intersection Signal Delay: 8.3							
Intersection Capacity Utilization 53.1%							
ICU Level of Service A							
Analysis Period (min) 15							



Queues 2032 Future Background AM Model (ExRN) 03-22-2023

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN) 03-22-2023

22: Sackville Street & Dundas Street E

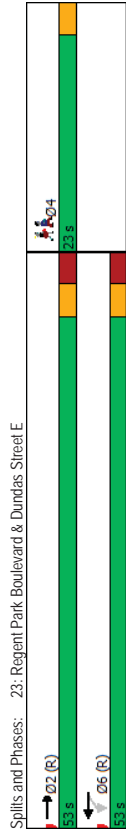
	EBT	WBT	NBT	SBT
Lane Group	452	432	73	122
Lane Group Flow (vph)	0.22	0.40	0.22	0.32
v/c Ratio	6.6	5.6	12.9	20.2
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	6.6	5.9	12.9	20.2
Total Delay	8.9	30.5	3.2	11.0
Queue Length 50th (m)	30.1	8.4	12.5	23.9
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2020	1075	376	426
Station Cap Reductn	0	217	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.50	0.19	0.29
<b>Intersection Summary</b>				

22: Sackville Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↓			↑			↓	↓
Traffic Volume (vph)	0	405	25	10	400	0	45	0	45	0	25	35
Future Volume (vph)	0	405	25	10	400	0	45	0	45	0	25	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5
Total Lost time (s)	5.0	5.0			5.0			5.0			5.0	5.0
Lane Util. Factor	0.95	1.00			1.00			1.00			1.00	1.00
Frbp. ped/bikes	0.99	1.00			1.00			0.95			0.98	0.98
Frbp. ped/bikes	1.00	1.00			1.00			0.96			0.97	0.97
Frt	0.99	1.00			1.00			0.95			0.96	0.96
Frt Protected	1.00	1.00			1.00			0.97			0.99	0.99
Sat'd. Flow (prot)	3229	1736			1736			1545			1630	1630
Flt Permitted	1.00	0.99			0.99			0.78			0.89	0.89
Sat'd. Flow (perm)	3229	1717			1717			1250			1481	1481
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	426	26	11	421	0	47	0	26	37	53	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	33	0	0	17	0
Lane Group Flow (vph)	0	452	0	0	432	0	40	0	40	0	105	0
Confl. Peds. (#/hr)	65	85	85	85	65	65	65	60	60	60	65	65
Confl. Bikes (#/hr)	10	25			25			25			60	60
Heavy Vehicles (%)	0%	8%	13%	0%	8%	0%	0%	0%	8%	6%	2%	4%
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	2			6			8				4	
Permitted Phases		6					8			4		
Actuated Green, G (s)	46.6	46.6		46.6			17.4			17.4		17.4
Effective Green, g (s)	47.6	47.6		47.6			18.4			18.4		18.4
Actuated g/C Ratio	0.63	0.63		0.63			0.24			0.24		0.24
Clearance Time (s)	6.0	6.0		6.0			6.0			6.0		6.0
Vehicle Extension (s)	3.0	3.0		3.0			3.0			3.0		3.0
Lane Grp Cap (vph)	2022	1075		1075			302			358		358
v/s Ratio Prot	0.14											
v/s Ratio Perm	0.22	0.25		0.25			0.03			0.07		0.07
v/c Ratio	0.40	0.40		0.40			0.13			0.29		0.29
Uniform Delay, d1	6.2	7.1		7.1			22.6			23.5		23.5
Progression Factor	0.92	0.56		0.56			1.00			1.00		1.00
Incremental Delay, d2	0.3	1.1		1.1			0.2			0.5		0.5
Delay (s)	5.9	5.0		5.0			22.8			23.9		23.9
Level of Service	A	A		A			C			C		C
Approach Delay (s)	5.9	5.0		5.0			22.8			23.9		23.9
Approach LOS	A	A		A			C			C		C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	8.7 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 10.0											
Intersection Capacity Utilization	53.1% ICU Level of Service A											
Analysis Period (min)	15											
c Critical Lane Group												

Timings 2032 Future Background AM Model (ExRN) 03-22-2023  
 23: Regent Park Boulevard & Dundas Street E

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	4	4	4	4
Traffic Volume (vph)	450	20	410	4
Future Volume (vph)	450	20	410	4
Turn Type	NA	Perm	NA	NA
Protected Phases	2	6	6	4
Permitted Phases	2	6	6	4
Detector Phase	2	6	6	4
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.33	0.31	0.31	
Control Delay	3.9	4.6	4.6	
Queue Delay	0.0	0.0	0.0	
Total Delay	3.9	4.7	4.7	
LOS	A	A	A	
Approach Delay	3.9	4.7	4.7	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 8 (1%) Referenced to phase 2:EBT and 6:WBL, Start of 1st Green				
Natural Cycle: 50				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.33				
Intersection Signal Delay: 4.3				Intersection LOS: A
Intersection Capacity Utilization 57.3%				ICU Level of Service B
Analysis Period (min) 15				



Queues 2032 Future Background AM Model (ExRN) 03-22-2023  
 23: Regent Park Boulevard & Dundas Street E

Lane Group	EBT	WBT
Lane Group Flow (vph)	485	448
v/c Ratio	0.33	0.31
Control Delay	3.9	4.6
Queue Delay	0.0	0.0
Total Delay	3.9	4.7
Queue Length 50th (m)	6.9	0.0
Queue Length 95th (m)	26.3	45.4
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1469	1434
Starvation Cap Reductn	36	112
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.34	0.34
<b>Intersection Summary</b>		

23: Regent Park Boulevard & Dundas Street E

2032 Future Background AM Model (ExRN)

03-22-2023

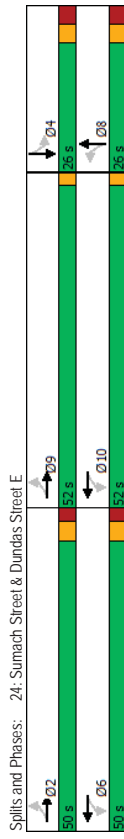
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Volume (vph)	450	15	20	410	0	0
Future Volume (vph)	450	15	20	410	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.99		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	1.00		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1720		1724			
Flt Permitted	1.00		0.97			
Sat'd Flow (perm)	1720		1680			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	469	16	21	427	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	484	0	0	448	0	0
Conf. Peds. (#/hr)	125	125	40	60		
Heavy Vehicles (%)	8%	0%	9%	8%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases	6		6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1360		1328			
v/s Ratio Prot	cd.28		0.27			
v/s Ratio Perm	0.36		0.34			
Uniform Delay, d1	2.3		2.3			
Progression Factor	0.80		1.00			
Incremental Delay, d2	0.7		0.7			
Delay (s)	2.6		3.0			
Level of Service	A		A			
Approach Delay (s)	2.6		3.0	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.8 HCM 2000 Level of Service					
HCM 2000 Volume to Capacity ratio	0.31					
Actuated Cycle Length (s)	76.0 Sum of lost time (s)					
Intersection Capacity Utilization	57.3% ICU Level of Service					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

2032 Future Background AM Model (ExRN)

03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB
Traffic Volume (vph)	15	415	25	385	15	30	50	30
Future Volume (vph)	15	415	25	385	15	30	50	30
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2 9		6 10		8		4	
Permitted Phases	2		6		8		4	
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%	39%	41%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	0.0
Lost Time Adjust (s)			-1.0		-1.0			
Total Lost Time (s)			5.0		5.0			
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	61.4		61.4		22.9		22.9	
Actuated g/C Ratio	0.65		0.65		0.24		0.24	
v/C Ratio	0.45		0.48		0.31		0.39	
Control Delay	8.0		8.3		27.8		38.6	
Queue Delay	1.4		0.3		0.0		0.0	
Total Delay	9.5		8.6		27.8		38.6	
LOS	A		A		C		D	
Approach Delay	9.5		8.6		27.8		38.6	
Approach LOS	A		A		C		D	
Intersection Summary								
Cycle Length	128							
Actuated Cycle Length	94.1							
Natural Cycle	100							
Control Type	Actuated-Uncoordinated							
Maximum v/c Ratio	0.48							
Intersection Signal Delay	13.6							
Intersection Capacity Utilization	58.7%							
Analysis Period (min)	15							



Queues 2032 Future Background AM Model (ExRN) 03-22-2023  
 24: Sumach Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	489	499	109	120
Lane Group Flow (vph)	0.45	0.48	0.31	0.39
v/c Ratio	8.0	8.3	27.8	38.6
Control Delay	1.4	0.3	0.0	0.0
Queue Delay	9.5	8.6	27.8	38.6
Total Delay	34.6	35.6	11.5	18.8
Queue Length 50th (m)	50.5	52.5	29.3	39.6
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1248	1194	353	311
Station Cap Reductn	544	246	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.53	0.31	0.39
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN) 03-22-2023  
 24: Sumach Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4	4		4	4		4			4	4	
Traffic Volume (vph)	15	415	20	25	385	50	15	30	55	50	30	30	
Future Volume (vph)	15	415	20	25	385	50	15	30	55	50	30	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.98	0.98	0.98	0.97	0.97	0.93	0.93	0.93	0.92	0.92	0.96	0.96	
Frbp. ped/bikes	1.00	1.00	0.99	0.99	0.99	0.97	0.97	0.97	0.96	0.96	0.96	0.96	
Frt	1.00	1.00	0.99	0.99	0.99	0.93	0.93	0.93	0.98	0.98	0.98	0.98	
Flt Protected	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.98	0.98	
Satd. Flow (prot)	1698	1698	1659	1659	1659	1463	1463	1463	1504	1504	1504	1504	
Flt Permitted	0.98	0.98	0.96	0.96	0.96	0.95	0.95	0.95	0.84	0.84	0.84	0.84	
Satd. Flow (perm)	1668	1668	1603	1603	1603	1373	1373	1373	1295	1295	1295	1295	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	451	22	27	418	54	16	33	60	54	33	33	
RTOR Reduction (vph)	0	2	0	0	5	0	0	31	0	0	10	0	
Lane Group Flow (vph)	0	487	0	0	494	0	0	78	0	0	110	0	
Confl. Peds. (#/hr)	70	135	135	70	120	70	120	50	50	50	120	120	
Confl. Bikes (#/hr)		5			30								
Heavy Vehicles (%)	13%	7%	14%	9%	8%	3%	11%	3%	10%	0%	3%	10%	
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA	
Protected Phases	2.9			6.10			8				4		
Permitted Phases	2.9			6.10			8				4		
Actuated Green, G (s)	63.9			63.9			21.8				21.8		
Effective Green, g (s)	64.9			64.9			22.8				22.8		
Actuated g/C Ratio	0.69			0.69			0.24				0.24		
Clearance Time (s)							6.0				6.0		
Vehicle Extension (s)							3.0				3.0		
Lane Grp Cap (vph)	1155			1110			334				315		
v/s Ratio Prot													
v/s Ratio Perm	0.29			0.31			0.06				0.09		
v/c Ratio	0.42			0.45			0.23				0.35		
Uniform Delay, d1	6.3			6.4			28.4				29.3		
Progression Factor	1.00			1.00			1.00				1.00		
Incremental Delay, d2	0.2			0.3			0.4				0.7		
Delay (s)	6.5			6.7			28.8				30.0		
Level of Service	A			A			C				C		
Approach Delay (s)	6.5			6.7			28.8				30.0		
Approach LOS	A			A			C				C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	10.9											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43												
Actuated Cycle Length (s)	93.7											Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.7%											ICU Level of Service	B
Analysis Period (min)	15												
c Critical Lane Group													



25: Tubman Avenue & Dundas Street E

03-22-2023

2032 Future Background AM Model (ExRN)

03-22-2023

2032 Future Background AM Model (ExRN)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	505	15	5	460	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	505	15	5	460	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	561	17	6	511	0	0	0	0	0	0	0
Pedestrians	5			5			115				45	
Lane Width (m)	3.5			3.5			0.0				3.5	
Walking Speed (m/s)	1.1			1.1			1.1				1.1	
Percent Blockage	0			0			0				4	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	99			98								
pX platoon unblocked	0.84			0.89			0.90			0.89	0.90	0.90
VC, conflicting volume	556			693			1212			690	1142	1261
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	378			590			895			940	586	817
IC, single (s)	4.1			4.1			7.1			6.2	7.1	6.5
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5			4.0	3.3	4.0
p0 queue free %	100			99			100			100	100	100
CM capacity (veh/h)	963			883			227			228	454	246
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	578	517	0									
Volume Left	0	6	0									
Volume Right	17	0	0									
cSH	963	883	1700									
Volume to Capacity	0.00	0.01	0.00									
Queue Length 95th (m)	0.0	0.2	0.0									
Control Delay (s)	0.0	0.2	0.0									
Lane LOS	A	A	A									
Approach Delay (s)	0.0	0.2	0.0									
Approach LOS	A	A	A									
Intersection Summary												
Average Delay							0.1					
Intersection Capacity Utilization							39.7%					A
Analysis Period (min)							15					

26: River Street & Dundas Street E

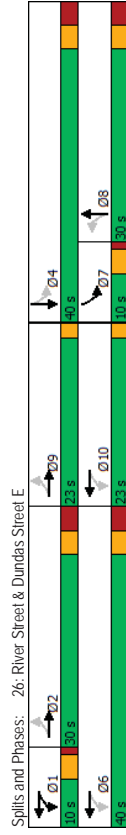
03-22-2023

2032 Future Background AM Model (ExRN)

03-22-2023

2032 Future Background AM Model (ExRN)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations												
Traffic Volume (vph)	10	445	110	315	70	325	120	410				
Future Volume (vph)	10	445	110	315	70	325	120	410				
Turn Type	Perm	NA	custom	NA	Perm	NA	pm+pt	NA				
Protected Phases	2 9	1	1 6 10	8	8	7	4					
Permitted Phases	2	2	1	1 6	8	8	7	4				
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0			21.0	21.0	5.0	21.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)	10.0			27.0	27.0	9.0	27.0	27.0	27.0	27.0	23.0	23.0
Total Split (s)	30.0			30.0	30.0	10.0	40.0	40.0	30.0	40.0	23.0	23.0
Total Split (%)	9.7%			29.1%	29.1%	9.7%	38.8%	38.8%	29%	39%	22%	22%
Yellow Time (s)	3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	1.0			3.0	3.0	1.0	3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0	-1.0	-1.0				
Total Lost Time (s)				5.0	5.0	3.0	5.0	5.0				
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	None	None	None				
Act Effct Green (s)	28.4			40.5	25.3	25.3	37.4	35.4				
Actuated g/C Ratio	0.34			0.48	0.30	0.30	0.45	0.42				
v/C Ratio	0.94			0.82	0.43	0.98	0.58	0.77				
Control Delay	52.7			29.0	36.4	66.5	29.5	31.6				
Queue Delay	0.0			0.0	0.0	0.0	0.0	0.0				
Total Delay	52.7			29.0	36.4	66.5	29.5	31.6				
LOS	D	C	D	E	D	E	C	C				
Approach Delay	52.7			29.0	36.4	62.6	31.2	31.2				
Approach LOS	D	C	C	E	E	C	C	C				
Intersection Summary												
Cycle Length	103											
Actuated Cycle Length	84											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/C Ratio	0.98											
Intersection Signal Delay	43.7											
Intersection Capacity Utilization	114.3%											
Analysis Period (min)	15											



Queues 2032 Future Background AM Model (ExRN) 03-22-2023

26: River Street & Dundas Street E

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	537	505	74	490	128	521
Lane Group Flow (vph)	0.94	0.82	0.43	0.98	0.58	0.77
v/c Ratio	52.7	29.0	36.4	66.5	29.5	31.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	52.7	29.0	36.4	66.5	29.5	31.6
Total Delay	118.9	80.7	#30.4	#179.1	#37.1	#164.4
Queue Length 50th (m)	82.8	54.5	8.8	69.6	10.9	62.2
Queue Length 95th (m)	118.9	80.7	#30.4	#179.1	#37.1	#164.4
Internal Link Dist (m)	73.4	80.5		131.0		118.9
Turn Bay Length (m)			20.0		25.0	
Base Capacity (vph)	583	624	171	500	220	678
Station Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.81	0.43	0.98	0.58	0.77

Intersection Summary

- Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN) 03-22-2023

26: River Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+	+									
Traffic Volume (vph)	10	445	50	110	315	50	70	325	135	120	410	80
Future Volume (vph)	10	445	50	110	315	50	70	325	135	120	410	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	3.0	3.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. psd/bikes	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	1.00	0.99	1.00	0.99	1.00	0.96	1.00	0.96	1.00	0.95	1.00	0.98
Flt Protected	1.00	0.99	1.00	0.99	1.00	0.96	1.00	0.96	1.00	0.95	1.00	0.98
Satd. Flow (prot)	1701	1701	1705	1705	1459	1630	1601	1605	1601	1605	1605	1605
Flt Permitted	0.99	0.99	0.68	0.68	0.37	1.00	0.14	1.00	0.14	1.00	0.14	1.00
Satd. Flow (perm)	1681	1681	1176	1176	570	1630	238	1605	238	1605	1605	1605
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	11	473	53	117	335	53	74	346	144	128	436	85
RTOR Reduction (vph)	0	4	0	0	5	0	0	13	0	0	6	0
Lane Group Flow (vph)	0	533	0	0	500	0	74	477	0	128	515	0
Conf. Peds. (#/hr)	65	90	90	65	65	65	45	45	45	45	65	65
Conf. Bikes (#/hr)		5		5	30						15	
Heavy Vehicles (%)	0%	7%	4%	3%	7%	0%	9%	9%	1%	5%	12%	7%
Turn Type	Perm	NA	NA	custom	NA	NA	Perm	NA	NA	pm+pl	NA	NA
Protected Phases		2.9		1	1.6	1.0		8		7		4
Permitted Phases		2.9		6	10			8		4		4
Actuated Green, G (s)		33.1		43.2		24.3		24.3		34.4		34.4
Effective Green, g (s)		34.1		39.2		25.3		25.3		35.4		35.4
Actuated g/C Ratio		0.40		0.46		0.30		0.30		0.41		0.41
Clearance Time (s)						6.0		6.0		4.0		6.0
Vehicle Extension (s)						3.0		3.0		3.0		3.0
Lane Grp Cap (vph)		669		582		168		481		211		663
v/s Ratio Prot		c0.32		c0.07		c0.29		0.05		c0.32		0.20
v/c Ratio Perm		0.80		0.86		0.44		0.99		0.61		0.78
Uniform Delay, d1		22.7		20.7		24.4		30.0		18.9		21.7
Progression Factor		1.00		1.00		1.00		1.00		1.00		1.00
Incremental Delay, d2		6.5		12.0		1.8		38.5		4.9		5.7
Delay (s)		29.2		32.7		26.3		68.6		23.8		27.4
Level of Service		C		C		C		E		C		C
Approach Delay (s)		29.2		32.7		63.0		26.7		26.7		26.7
Approach LOS		C		C		E		C		C		C
Intersection Summary												
HCM 2000 Control Delay	37.7 HCM 2000 Level of Service D											
HCM 2000 Volume to Capacity ratio	0.95											
Actuated Cycle Length (s)	85.6 Sum of lost time (s) 17.0											
Intersection Capacity Utilization	114.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 27: Dreamer's Way & Gerrard Street E

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	350	25	5	785	0	0
Future Volume (Veh/h)	350	25	5	785	0	0
Sign Control	Free	Free	Stop	Free	Stop	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	389	28	6	872	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)	88			164		
Upstream signal (m)	0.97			0.90		0.97
pX platoon unblocked	417			851		208
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	345			471		130
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)						
p0 queue free %	2.2			3.5		3.3
IF (s)	99			100		100
pM capacity (veh/h)	1192			471		877
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volumes Total	259	158	297	581		
Volume Left	0	0	6	0		
Volume Right	0	28	0	0		
cSH	1700	1700	1192	1700		
Volumes to Capacity	0.15	0.09	0.01	0.34		
Queue Length 95th (m)	0.0	0.0	0.1	0.0		
Control Delay (s)	0.0	0.0	0.2	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0		0.1			
Approach LOS			A			
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	28.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (ExRN)  
 29: Sumach Street & Site Driveway

03-22-2023

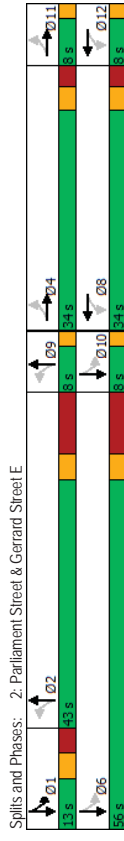
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	0	60	0	5	65
Future Volume (Veh/h)	0	0	60	0	5	65
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	67	0	6	72
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None		None		None	
Median type						
Median storage (veh)						57
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	151		67		67	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	151		67		67	
IC, single (s)	6.4		6.2		4.1	
IC, 2 stage (s)						
p0 queue free %	3.5		3.3		2.2	
IF (s)	100		100		100	
pM capacity (veh/h)	842		1002		1547	
Direction, Lane #	WB 1	NB 1	SB 1			
Volumes Total	0	67	78			
Volume Left	0	0	6			
Volume Right	0	0	0			
cSH	1700	1700	1547			
Volumes to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.0	0.6			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	0.6			
Approach LOS			A			
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	10.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

03-22-2023  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4A	4A	
Traffic Volume (veh/h)	0	0	10	515	585	75
Future Volume (Veh/h)	0	0	10	515	585	75
Sign Control	Stop					
Grade	0%					
Peak Hour Factor	0.89					
Hourly flow rate (vph)	0	0	11	579	657	84
Pedestrians	150					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	39					
dx platoon unblocked	0.95					
VC, conflicting volume	1170					
VC1, stage 1 conf vol	526					
VC2, stage 2 conf vol	891					
VCu, unblocked vol	1078					
IC, single (s)	6.8					
IC, 2 stage (s)	3.5					
p0 queue free %	100					
IF (s)	100					
CM capacity (veh/h)	201					
Direction, Lane #	NB 1		NB 2		SB 2	
Volume Total	204		386		438	
Volume Left	11		0		0	
Volume Right	0		0		84	
cSH	702		1700		1700	
Volume to Capacity	0.02		0.23		0.26	
Queue Length 95th (m)	0.4		0.0		0.0	
Control Delay (s)	0.7		0.0		0.0	
Lane LOS	A		A		A	
Approach Delay (s)	0.2		0.0		0.0	
Approach LOS	A		A		A	
<b>Intersection Summary</b>						
Average Delay	0.1					
Intersection Capacity Utilization	32.9%					
Analysis Period (min)	15					
			ICU Level of Service		A	

03-22-2023  
 2032 Future Background PM Model (ExRN)  
 2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø4	Ø6	Ø8
Lane Configurations		4TB		4TB		4TB		4TB				
Traffic Volume (vph)	30	545	40	250	75	355	230	285				
Future Volume (vph)	30	545	40	250	75	355	230	285				
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA				
Protected Phases	4 11 8 12 2 9 1 1 6 10 2 4 6 8											
Permitted Phases	4 4 4 8 8 8 2 2 2 1 1 6											
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0											
Minimum Spilt (s)	12.5											
Total Spilt (s)	13.0											
Total Split (%)	12.3%											
Yellow Time (s)	3.3											
All-Red Time (s)	3.2											
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead Lag											
Recall Mode	Yes Yes											
Ad Effct Green (s)	31.4 28.9											
Actuated g/C Ratio	0.33 0.30											
v/C Ratio	0.64 0.49											
Control Delay	30.0 37.1											
Queue Delay	0.0 0.0											
Total Delay	30.0 37.1											
LOS	C C											
Approach Delay	30.0 22.5											
Approach LOS	C C											
<b>Intersection Summary</b>												
Cycle Length: 106												
Actuated Cycle Length: 94.9												
Natural Cycle: 95												
Control Type: Actuated-Uncoordinated												
Maximum v/C Ratio: 0.76												
Intersection Signal Delay: 25.9	Intersection LOS: C											
Intersection Capacity Utilization 99.2%	ICU Level of Service F											
Analysis Period (min) 15												



Timings  
2: Parliament Street & Gerrard Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	8.0	8.0	8.0	8.0
Total Split (s)	8.0	8.0	8.0	8.0
Total Split (%)	8%	8%	8%	8%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

Queues  
2: Parliament Street & Gerrard Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

	→	←	↑	↓
	EBT	WBT	NBT	SBT
Lane Group	665	443	562	603
Lane Group Flow (vph)	0.64	0.49	0.76	0.51
v/c Ratio	30.0	22.5	37.1	13.4
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	30.0	22.5	37.1	13.4
Total Delay	54.7	28.0	50.0	30.9
Queue Length 50th (m)	76.4	43.9	72.2	43.6
Queue Length 95th (m)	33.0	65.6	119.2	15.0
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1099	934	847	1235
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	0.61	0.47	0.66	0.49
Intersection Summary				

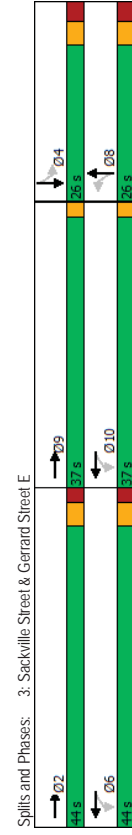


2. Parliament Street & Gerrard Street E 2032 Future Background PM Model (ExRN) 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	30	545	70	40	250	140	75	355	115	230	285	70
Traffic Volume (vph)	30	545	70	40	250	140	75	355	115	230	285	70
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Lane Util. 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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd Flow (prot)	3400	3094	3105	3105	3105	3105	3105	3105	3105	3172	3172	3172
Flt Permitted	0.91	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Sat'd Flow (perm)	3117	2592	2347	2347	2347	2347	2347	2347	2347	1949	1949	1949
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	31	562	72	41	258	144	77	366	119	237	294	72
RTOR Reduction (vph)	0	9	0	0	53	0	0	18	0	0	11	0
Lane Group Flow (vph)	0	656	0	0	390	0	0	544	0	0	592	0
Conf. Peds. (#/hr)	130	120	120	130	125	125	235	235	235	235	125	125
Conf. Bikes (#/hr)	25	25	25	25	25	25	15	15	15	15	15	15
Heavy Vehicles (%)	10%	0%	5%	0%	0%	10%	4%	2%	2%	6%	4%	0%
Turn Type	Perim	MA	Perm	MA	Perm	NA	Perm	NA	Perm	custom	MA	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10
Permitted Phases	4 11	8 12	8 12	2 9	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10
Actuated Green, G (s)	35.1	36.1	35.1	43.8	44.8	44.8	47.7	47.7	47.7	47.7	47.7	47.7
Effective Green, g (s)	36.1	36.1	36.1	44.8	44.8	44.8	47.7	47.7	47.7	47.7	47.7	47.7
Actuated g/C Ratio	0.38	0.38	0.38	0.47	0.47	0.47	0.50	0.50	0.50	0.50	0.50	0.50
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1172	974	974	1095	1095	1095	1065	1065	1065	1065	1065	1065
v/s Ratio Prot	c0.21	0.15	0.15	60.23	60.23	60.23	c0.04	c0.04	c0.04	c0.04	c0.04	c0.04
v/s Ratio Perm	0.56	0.40	0.40	0.50	0.50	0.50	0.56	0.56	0.56	0.56	0.56	0.56
v/c Ratio	23.7	22.0	22.0	17.8	17.8	17.8	16.8	16.8	16.8	16.8	16.8	16.8
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.6	0.3	0.3	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6
Incremental Delay, d2	24.3	22.3	22.3	18.1	18.1	18.1	17.4	17.4	17.4	17.4	17.4	17.4
Delay (s)	C	C	C	B	B	B	B	B	B	B	B	B
Level of Service	C	C	C	B	B	B	B	B	B	B	B	B
Approach Delay (s)	24.3	22.3	22.3	18.1	18.1	18.1	17.4	17.4	17.4	17.4	17.4	17.4
Approach LOS	C	C	C	B	B	B	B	B	B	B	B	B
Intersection Summary												
HCM 2000 Control Delay	20.5 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	96.0 Sum of lost time (s) 22.5											
Intersection Capacity Utilization	99.2% ICU Level of Service F											
Analysis Period (min)	15											
c Critical Lane Group												

3. Sackville Street & Gerrard Street E 2032 Future Background PM Model (ExRN) 03-22-2023

Movement	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4 11	4 11	4 11	4 11	4 11	4 11	4 11
Traffic Volume (vph)	940	35	535	5	0	135	40
Future Volume (vph)	940	35	535	5	0	135	40
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2 9	6 10	6 10	8	4	2	6 9 10
Permitted Phases	2 9	6 10	6 10	8	4	2	6 9 10
Detector Phase	2	6	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	20.0	20.0	20.0	20.0	16.0	16.0	5.0
Minimum Split (s)	25.7	25.7	25.7	21.0	21.0	21.0	37.0
Total Split (s)	26.0	26.0	26.0	26.0	44.0	44.0	37.0
Total Split (%)	24.3%	24.3%	24.3%	24.3%	41%	41%	35%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	2.0	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode							
Act Effect Green (s)	37.3	37.3	37.3	21.7	21.7	21.7	None
Actuated g/C Ratio	0.55	0.55	0.55	0.32	0.32	0.32	0.32
v/c Ratio	0.53	0.37	0.37	0.08	0.50	0.50	0.50
Control Delay	10.2	8.8	8.8	7.3	26.4	26.4	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	8.8	8.8	7.3	26.4	26.4	26.4
LOS	B	A	A	A	C	C	C
Approach Delay	10.2	8.8	8.8	7.3	26.4	26.4	26.4
Approach LOS	B	A	A	A	C	C	C
Intersection Summary							
Cycle Length: 107							
Actuated Cycle Length: 67.9							
Natural Cycle: 85							
Control Type: Actuated-Uncoordinated							
Maximum v/c Ratio: 0.53							
Intersection Signal Delay: 11.5							
Intersection Capacity Utilization: 66.9%							
Analysis Period (min): 15							



Queues  
3. Sackville Street & Gerrard Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	995	593	36	209
Lane Group Flow (vph)	0.53	0.37	0.08	0.50
v/c Ratio	10.2	8.8	7.3	26.4
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	10.2	8.8	7.3	26.4
Total Delay	36.7	19.6	0.0	22.0
Queue Length 50th (m)	49.7	28.2	5.9	47.8
Queue Length 95th (m)	138.2	47.8	34.3	15.3
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2215	1868	469	426
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.32	0.08	0.49
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
3. Sackville Street & Gerrard Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4↑	4↑		4↑			4↑					
Traffic Volume (vph)	0	940	15	35	535	0	5	0	30	135	40	25	
Future Volume (vph)	0	940	15	35	535	0	5	0	30	135	40	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5	
Total Lost time (s)		4.0		4.0			4.7					4.7	
Lane Util. Factor		0.95		0.95			1.00					1.00	
Frbp. ped/bikes		1.00		1.00			0.94					0.99	
Frbp. ped/bikes		1.00		1.00			0.99					0.96	
Frt		1.00		1.00			0.88					0.97	
Frt Protected		3448		3363			1466					1682	
Satd. Flow (prot)		1.00		0.86			0.96					0.78	
Flt Permitted		3448		2911			1419					1349	
Satd. Flow (perm)		0.96		0.96			0.96					0.96	
Peak-hour factor, PHF		0.979		0.36			0.557					0.31	
Adj. Flow (vph)		0		0			0					0	
RTOR Reduction (vph)		2		0			0					0	
Lane Group Flow (vph)		0	993	0	593	0	0	11	0	0	205	0	
Confl. Peds. (#/hr)	85	70	70	85	90	85	90	60	60	60	90	90	
Confl. Bikes (#/hr)		60		15			5					10	
Heavy Vehicles (%)	0%	3%	0%	0%	6%	0%	0%	0%	5%	1%	0%	0%	
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Protected Phases	2.9			6.10			8					4	
Permitted Phases				6.10			8					4	
Actuated Green, G (s)		39.8		39.8			20.6					20.6	
Effective Green, g (s)		40.8		40.8			21.6					21.6	
Actuated q/C Ratio		0.60		0.60			0.32					0.32	
Clearance Time (s)							5.7					5.7	
Vehicle Extension (s)							3.0					3.0	
Lane Grp Cap (vph)		2065		1744			450					427	
v/s Ratio Prot		c0.29											
v/s Ratio Perm		0.48		0.20			0.01					0.15	
v/c Ratio		7.7		6.9			1.60					1.87	
Uniform Delay, d1		1.00		1.00			1.00					1.00	
Progression Factor		0.2		0.1			0.0					0.9	
Incremental Delay, d2		7.9		7.0			16.0					19.6	
Delay (s)		A		A			B					B	
Level of Service		A		A			B					B	
Approach Delay (s)		7.9		7.0			16.0					19.6	
Approach LOS		A		A			B					B	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	9.1											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50												
Actuated Cycle Length (s)	68.1											Sum of lost time (s)	9.7
Intersection Capacity Utilization	66.9%											ICU Level of Service	C
Analysis Period (min)	15												
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 4: Gerrard Street E & Gifford Street

03-22-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4A	4B		W	
Traffic Volume (veh/h)	10	1095	565	5	15	5
Future Volume (Veh/h)	10	1095	565	5	15	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	1288	665	6	18	6
Pedestrians		5			65	
Lane Width (m)		3.5	3.0		3.0	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0			5	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
pX platoon unblocked		0.98		0.85	0.98	
VC conflicting volume		736		1401	406	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol		678		989	339	
IC single (s)		4.1		6.8	6.9	
IC 2 stage (s)		2.2		3.5	3.3	
p0 queue free %		99		91	99	
CM capacity (veh/h)		856		197	612	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volumes Total	441	859	443	228	24	24
Volume Left	12	0	0	0	18	0
Volume Right	0	0	0	0	6	6
cSH	856	1700	1700	1700	238	
Volumes to Capacity	0.01	0.51	0.26	0.13	0.10	
Queue Length 95th (m)	0.3	0.0	0.0	0.0	2.5	
Control Delay (s)	0.4	0.0	0.0	0.0	21.9	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		21.9	
Approach LOS					C	
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	48.8%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 5: Gerrard Street E & Nasmith Avenue

03-22-2023

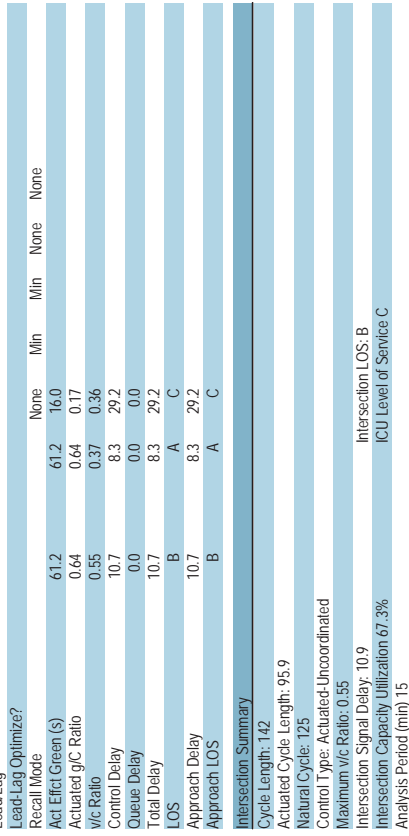


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4A	4B		W	
Traffic Volume (veh/h)	5	1105	565	5	5	5
Future Volume (Veh/h)	5	1105	565	5	5	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	1270	649	6	6	6
Pedestrians					60	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					5	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
pX platoon unblocked		0.95		0.88	0.95	
VC conflicting volume		715		1359	388	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol		589		860	244	
IC single (s)		4.1		6.8	6.9	
IC 2 stage (s)		2.2		3.5	3.3	
p0 queue free %		99		98	99	
CM capacity (veh/h)		901		249	690	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volumes Total	429	847	433	222	12	12
Volume Left	6	0	0	0	6	6
Volume Right	0	0	0	0	6	6
cSH	901	1700	1700	1700	366	
Volumes to Capacity	0.01	0.50	0.25	0.13	0.03	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.8	
Control Delay (s)	0.2	0.0	0.0	0.0	15.2	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		15.2	
Approach LOS					C	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	44.0%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings 2032 Future Background PM Model (ExRN) 03-22-2023

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations									
Traffic Volume (vph)	10	1080	20	550	25				
Future Volume (vph)	10	1080	20	550	25				
Turn Type	Perm	NA	Perm	NA	NA				
Protected Phases	2.9		6.10	8	2	6	9	10	
Permitted Phases	2.9		6.10		8				
Detector Phase	2.9		6.10	6.10	8				
Switch Phase									
Minimum Initial (s)				15.0	11.0	11.0	5.0	5.0	
Minimum Split (s)				25.4	26.2	26.2	72.0	72.0	
Total Split (s)				27.0	43.0	43.0	72.0	72.0	
Total Split (%)				19.0%	30%	30%	51%	51%	
Yellow Time (s)				3.0	3.0	3.0	2.0	2.0	
All-Red Time (s)				7.4	7.2	7.2	0.0	0.0	
Lost Time Adjust (s)				-1.0					
Total Lost Time (s)				9.4					
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode				None	Min	Min	None	None	
Act Effct Green (s)		61.2		61.2	16.0				
Actuated g/C Ratio		0.64		0.64	0.17				
v/c Ratio		0.55		0.37	0.36				
Control Delay		10.7		8.3	29.2				
Queue Delay		0.0		0.0	0.0				
Total Delay		10.7		8.3	29.2				
LOS		B		A	C				
Approach Delay		10.7		8.3	29.2				
Approach LOS		B		A	C				
Intersection Summary									
Cycle Length: 142									
Actuated Cycle Length: 95.9									
Natural Cycle: 125									
Control Type: Actuated-Uncoordinated									
Maximum v/c Ratio: 0.55									
Intersection Signal Delay: 10.9									
Intersection Capacity Utilization 67.3%									
Analysis Period (min) 15									



Queues 2032 Future Background PM Model (ExRN) 03-22-2023

6: Summach Street & Gerrard Street E

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	1144	676	104
v/c Ratio	0.55	0.37	0.36
Control Delay	10.7	8.3	29.2
Queue Delay	0.0	0.0	0.0
Total Delay	10.7	8.3	29.2
Queue Length 50th (m)	55.7	26.5	11.7
Queue Length 95th (m)	70.9	36.0	27.5
Internal Link Dist (m)	44.0	75.7	30.7
Turn Bay Length (m)			
Base Capacity (vph)	3225	2698	311
Starvation Cap Reductn	242	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.25	0.33
Intersection Summary			

6: Sumach Street & Gerrard Street E 2032 Future Background PM Model (ExRN) 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T			4B					
Traffic Volume (vph)	10	1080	20	20	550	85	20	25	55	0	0	0
Future Volume (vph)	10	1080	20	20	550	85	20	25	55	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp. ped/bikes	0.99			0.96			0.95					
Fibp. ped/bikes	1.00			1.00			0.97					
Frt	1.00			0.98			0.93					
Flt Protected	1.00			1.00			0.99					
Sat'd. Flow (prot)	3466			3239			1593					
Flt Permitted	0.95			0.89			0.99					
Sat'd. Flow (perm)	3285			2886			1593					
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	1113	21	21	567	88	21	26	57	0	0	0
RTOR Reduction (vph)	0	1	0	0	9	0	0	29	0	0	0	0
Lane Group Flow (vph)	0	1143	0	0	667	0	0	75	0	0	0	0
Conf. Bikes (#/hr)	95	95	95	95	95	80	35	35	35	35	35	80
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perim	MA	Perm	NA	Perm	NA	Perim	NA	Perim	NA	Perim	NA
Protected Phases	2.9			6.10			8					
Permitted Phases	2.9			6.10			8					
Effective Green, G (s)	68.5			68.5			15.0					
Actuated Green, g (s)	69.5			69.5			16.0					
Actuated g/C Ratio	0.72			0.72			0.17					
Clearance Time (s)							10.4					
Vehicle Extension (s)							3.0					
Lane Grp Cap (vph)	2380			2091			265					
v/s Ratio Prot												
v/s Ratio Perm	60.35			0.23			0.05					
v/c Ratio	0.48			0.32			0.28					
Uniform Delay, d1	5.6			4.7			34.9					
Progression Factor	1.00			1.00			1.00					
Incremental Delay, d2	0.2			0.1			0.6					
Delay (s)	5.7			4.8			35.5					
Level of Service	A			A			D					
Approach Delay (s)	5.7			4.8			35.5					
Approach LOS	A			A			D					
Intersection Summary												
HCM 2000 Control Delay	7.0 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	95.9 Sum of lost time (s)											
Intersection Capacity Utilization	67.3% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

7: Gerrard Street E & Sword Street 2032 Future Background PM Model (ExRN) 03-22-2023

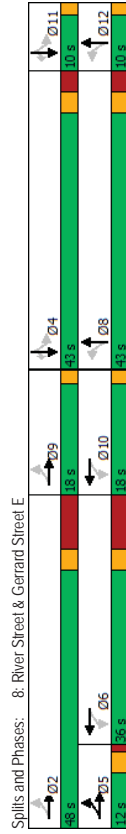
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR
Lane Configurations		4T		4T			4T	
Traffic Volume (veh/h)	0	1135	645	0	15	10	15	10
Future Volume (Veh/h)	0	1135	645	0	15	10	15	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1261	717	0	17	11	17	11
Pedestrians							65	
Lane Width (m)							3.0	
Walking Speed (m/s)							1.1	
Percent Blockage							5	
Right turn flare (veh)								
Median type		None		None				
Median storage (veh)								
Upstream signal (m)		100		91				
pX platoon unblocked	0.93			0.90			0.93	
vC, conflicting volume	782			1412			424	
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	618			887			233	
IC, single (s)	4.1			6.8			7.1	
IC, 2 stage (s)								
IF (s)	2.2			3.5			3.4	
p0 queue free %	100			93			98	
dM capacity (veh/h)	860			245			665	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2		
Volumes Total	630	630	358	358	28	28		
Volume Left	0	0	0	0	17	17		
Volume Right	0	0	0	0	0	0		
CSH	1700	1700	1700	1700	326	326		
Volumes to Capacity	0.37	0.37	0.21	0.21	0.09	0.09		
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.1	2.1		
Control Delay (s)	0.0	0.0	0.0	0.0	17.1	17.1		
Lane LOS					C	C		
Approach Delay (s)	0.0			0.0			17.1	
Approach LOS							C	
Intersection Summary								
Average Delay	0.2							
Intersection Capacity Utilization	41.4% ICU Level of Service							
Analysis Period (min)	15							



Timings  
8: River Street & Gerrard Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	225	855	80	385	70	340	165	450	190			
Future Volume (vph)	225	855	80	385	70	340	165	450	190			
Turn Type	custom	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	5	5.2.9	6.10	8.12	4.11	4.11	4.11	4.11	4.11	2	4	6
Permitted Phases	5	5.2.9	6.10	8.12	4.11	4.11	4.11	4.11	4.11	2	4	6
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0									23.0	19.0	23.0
Minimum Spilt (s)	10.0									33.8	30.0	33.8
Total Spilt (s)	12.0									48.0	43.0	36.0
Total Spilt (%)	10.1%									40%	36%	30%
Yellow Time (s)	3.0									3.0	3.0	3.0
All-Red Time (s)	1.0									7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None									Min	Min	Min
Act Effct Green (s)	55.6		36.5	39.0	39.0	39.0	39.0	39.0	39.0			
Actuated g/C Ratio	0.54		0.36	0.38	0.38	0.38	0.38	0.38	0.38			
v/C Ratio	0.90		0.91	0.36	0.77	1.00	0.67	0.30	0.38			
Control Delay	29.9		50.0	31.3	36.8	104.7	33.0	4.6	4.6			
Queue Delay	17.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	47.5		50.0	31.3	36.8	104.7	33.0	4.6	4.6			
LOS	D		D	C	D	F	C	C	A			
Approach Delay	47.5		50.0	36.1	36.1	41.0	41.0	41.0	41.0			
Approach LOS	D		D	D	D	D	D	D	D			
Intersection Summary												
Cycle Length:	119											
Actuated Cycle Length:	102.7											
Natural Cycle:	105											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	1.00											
Intersection Signal Delay:	44.2											
Intersection Capacity Utilization:	116.3%											
Analysis Period (min):	15											



Timings  
8: River Street & Gerrard Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Spilt (s)	30.0	18.0	18.0	10.0	10.0
Total Spilt (s)	43.0	18.0	18.0	10.0	10.0
Total Spilt (%)	36%	15%	15%	8%	8%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues 2032 Future Background PM Model (ExRN) 03-22-2023  
8: River Street & Gerrard Street E

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	1198	593	73	521	172	469	198
Lane Group Flow (vph)	0.90	0.91	0.36	0.77	1.00	0.67	0.30
v/c Ratio	29.9	50.0	31.3	36.8	104.7	33.0	4.6
Control Delay	17.6	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	47.5	50.0	31.3	36.8	104.7	33.0	4.6
Total Delay	67.0	81.6	126.5	61.7			
Queue Length 50th (m)	81.6	55.3	11.6	96.9	-41.0	86.1	0.0
Queue Length 95th (m)	#140.0	#98.4	24.8	138.5	#82.6	121.3	14.0
Internal Link Dist (m)	67.0	81.6	126.5	61.7			
Turn Bay Length (m)	30.0						
Base Capacity (vph)	1335	650	211	697	178	730	678
Stavation Cap Reductn	165	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.91	0.35	0.75	0.97	0.64	0.29
<b>Intersection Summary</b>							
-	Volume exceeds capacity, queue is theoretically infinite.						
-	Queue shown is maximum after two cycles.						
#	95th percentile volume exceeds capacity, queue may be longer.						
-	Queue shown is maximum after two cycles.						

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN) 03-22-2023  
8: River Street & Gerrard Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB								
Traffic Volume (vph)	225	855	70	80	385	105	70	340	160	165	450	190
Future Volume (vph)	225	855	70	80	385	105	70	340	160	165	450	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	3.0	9.8	9.8	9.8	9.8	9.8	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.99	0.99	1.00	0.99	1.00	1.00	0.99	1.00	0.98	1.00	1.00	0.96
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.98	1.00	1.00	1.00
Frt	0.99	0.99	1.00	0.99	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Flt Protected	0.99	0.99	1.00	0.99	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Satd. Flow (prot)	3383	3271	1625	1742	1625	1742	1643	1860	1424	1643	1860	1424
Flt Permitted	0.67	0.54					0.31	1.00	0.26	1.00	1.00	1.00
Satd. Flow (perm)	2281	1788	536	1742	536	1742	456	1860	1424	456	1860	1424
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	891	73	83	401	109	73	354	167	172	469	198
RTOR Reduction (vph)	0	4	0	0	15	0	0	14	0	0	0	114
Lane Group Flow (vph)	0	1194	0	0	578	0	73	507	0	172	469	84
Conf. Peds. (#/hr)	40	80	80	40	15	40	15	40	40	40	15	15
Conf. Bikes (#/hr)	35	35	35	15	15	15	15	15	15	15	15	10
Heavy Vehicles (%)	3%	2%	3%	0%	4%	0%	3%	0%	1%	1%	1%	2%
Turn Type	custom	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	5	2	9	6	10	8	12	8	12	4	11
Permitted Phases	2	9	6	10	6	10	8	12	8	12	4	11
Actuated Green, G (s)	57.4	48.6	46.3	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Effective Green, g (s)	48.6	46.3	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Actuated g/C Ratio	0.46	0.44	0.44	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1151	788	227	739	193	790	604					
v/s Ratio Prot	c0.09		0.29									
v/s Ratio Perm	c0.39		0.14									
v/c Ratio	1.04	0.73	0.32	0.69	0.89	0.59	0.14					
Uniform Delay, d1	28.2	24.3	20.1	24.5	28.0	23.2	18.5					
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2	36.6	3.6	0.8	2.7	36.2	1.2	0.1					
Delay (s)	64.8	27.8	20.9	27.2	64.1	24.4	18.6					
Level of Service	E	C	C	C	E	C	C					
Approach Delay (s)	64.8	27.8	20.9	27.2	64.1	24.4	18.6					
Approach LOS	E	C	C	C	E	C	C					
<b>Intersection Summary</b>												
HCM 2000 Control Delay	42.2 HCM 2000 Level of Service D											
HCM 2000 Volume to Capacity ratio	1.02											
Actuated Cycle Length (s)	105.0 Sum of lost time (s) 19.8											
Intersection Capacity Utilization	116.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 9. Sackville Street & Site Driveway

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	0	5	0	5	0	20	0	5	85	0
Future Volume (Veh/h)	10	0	0	5	0	5	0	20	0	5	85	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	0	0	6	0	6	0	24	0	6	100	0
Pedestrians	60			35			5			15		
Lane Width (m)	3.5			3.5			3.5			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	5			3			0			1		
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	217	231	165	176	231	74	160			59		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	217	231	165	176	231	74	160			59		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	99	100	99	100			100		
CM capacity (veh/h)	645	615	834	713	615	950	1356			1510		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	12	12	24	106								
Volume Left	12	6	0	6								
Volume Right	0	6	0	0								
cSH	645	814	1356	1510								
Volumes to Capacity	0.02	0.01	0.00	0.00								
Queue Length 95th (m)	0.4	0.3	0.0	0.1								
Control Delay (s)	10.7	9.5	0.0	0.4								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.7	9.5	0.0	0.4								
Approach LOS	B	A	A	A								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			26.6%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 10. Parliament Street & Oak Street

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	50	495	25	25	370
Future Volume (Veh/h)	35	50	495	25	25	370
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	41	59	582	29	29	435
Pedestrians	220		5			55
Lane Width (m)	3.0		3.5			3.5
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	17		0			5
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			151			143
pX platoon unblocked	0.93	0.93			0.93	
VC, conflicting volume	1097	580			831	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	956	401			670	
IC, single (s)	6.8	6.9			4.3	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.3	
p0 queue free %	79	87			96	
CM capacity (veh/h)	192	446			661	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	100	388	223	174	290	
Volume Left	41	0	0	29	0	
Volume Right	59	0	29	0	0	
cSH	289	1700	1700	661	1700	
Volumes to Capacity	0.35	0.23	0.13	0.04	0.17	
Queue Length 95th (m)	11.4	0.0	0.0	1.0	0.0	
Control Delay (s)	23.9	0.0	0.0	2.2	0.0	
Lane LOS	C	A	A	A	A	
Approach Delay (s)	23.9	0.0		0.8		
Approach LOS	C	A				
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			48.2%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 11: Oak Street & Dreamer's Way

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	55	35	0	15	45
Future Volume (Veh/h)	0	55	35	0	15	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	59	38	0	16	48
Pedestrians	25	10	10	40		
Lane Width (m)	3.5	3.5	3.0	3.0		
Walking Speed (m/s)	1.1	1.1	1.1	1.1		
Percent Blockage	2	1		3		
Right turn flare (veh)						
Median type	None	None	None	None		
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume	78			147	103	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	78			147	103	
IC single (s)	4.1			6.4	6.2	
IC 2 stage (s)	2.2			3.5	3.3	
p0 queue free %	100			98	95	
CM capacity (veh/h)	1487			817	908	
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	59	38	64			
Volume Left	0	0	16			
Volume Right	0	0	48			
cSH	1700	1700	883			
Volumes to Capacity	0.03	0.02	0.07			
Queue Length 95th (m)	0.0	0.0	1.8			
Control Delay (s)	0.0	0.0	9.4			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.4			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			27.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 12: Regent Street & Oak Street

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	70	0	0	20	15	45
Future Volume (Veh/h)	70	0	0	20	15	45
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	84	0	0	24	18	54
Pedestrians	15	15	15	40		
Lane Width (m)	3.5	3.5	3.0	3.0		
Walking Speed (m/s)	1.1	1.1	1.1	1.1		
Percent Blockage	1	1		3		
Right turn flare (veh)						
Median type	None	None	None	None		
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume			124	163	139	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol			124	163	139	
IC single (s)			4.1	6.4	6.2	
IC 2 stage (s)			2.2	3.5	3.3	
p0 queue free %			100	98	94	
CM capacity (veh/h)			1431	796	875	
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	84	24	72			
Volume Left	0	0	18			
Volume Right	0	0	54			
cSH	1700	1700	854			
Volumes to Capacity	0.05	0.01	0.08			
Queue Length 95th (m)	0.0	0.0	2.1			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			27.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
13: Oak Street & Site Driveway

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4			W	
Traffic Volume (veh/h)	10	105	20	0	5	0
Future Volume (Veh/h)	10	105	20	0	5	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	12	127	24	0	6	0
Pedestrians			65		35	
Lane Width (m)			3.5		3.0	
Walking Speed (m/s)			1.1		1.1	
Percent Blockage			6		3	
Right turn flare (veh)			None		None	
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	59				275	59
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	59				275	59
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
CM capacity (veh/h)	1516				654	986
Direction_Lane #	EB 1	WB 1	SB 1			
Volume Total	139	24	6			
Volume Left	12	0	6			
Volume Right	0	0	0			
cSH	1516	1700	654			
Volume to Capacity	0.01	0.01	0.01			
Queue Length 95th (m)	0.2	0.0	0.2			
Control Delay (s)	0.7	0.0	10.6			
Lane LOS	A	A	B			
Approach Delay (s)	0.7	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			22.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
14: Sackville Street & Oak Street

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4			4	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	20	75	20	5	0	0
Future Volume (vph)	20	75	20	5	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	83	22	6	0	0
Direction_Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	127	12	95			
Volume Left (vph)	22	6	11			
Volume Right (vph)	22	0	6			
Head (s)	-0.05	0.27	0.03			
Departure Headway (s)	4.1	4.5	4.2			
Degree Utilization, x	0.14	0.02	0.11			
Capacity (veh/h)	889	773	818			
Control Delay (s)	7.8	7.6	7.8			
Approach Delay (s)	7.8	7.6	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			32.4%		ICU Level of Service	A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 15: Sumach Street & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop	
Traffic Volume (vph)	20	55	10	0	0	0	5	80	75	15	35	5
Future Volume (vph)	20	55	10	0	0	0	5	80	75	15	35	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	22	60	11	0	0	0	5	88	82	16	38	5
Direction, Lane #												
Volume Total (vph)	EB 1	NB 1	SB 1									
Volume Left (vph)	93	175	59									
Volume Right (vph)	22	5	16									
Head (s)	11	82	5									
Departure Headway (s)	0.05	-0.20	0.13									
Degree Utilization, x	0.11	0.19	0.07									
Capacity (veh/h)	768	875	789									
Control Delay (s)	8.0	7.9	7.8									
Approach Delay (s)	8.0	7.9	7.8									
Approach LOS	A	A	A									
Intersection Summary												
Delay	7.9											
Level of Service	A											
Intersection Capacity Utilization	32.4%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 16: Tubman Avenue & Oak Street

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	10	0	0	0	0
Future Volume (Veh/h)	135	10	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	145	11	0	0	0	0
Pedestrians	20	5	30	5	30	0
Lane Width (m)	3.5	0.0	0.0	0.0	0.0	0.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2	0	0	0	0	0
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	None					
PK, platoon unblocked	None					
VC, conflicting volume	186	200	186	200	186	186
VC1, stage 1 conf vol	None					
VC2, stage 2 conf vol	None					
VCu, unblocked vol	186	200	186	200	186	186
IC, single (s)	4.1	6.4	6.4	6.4	6.2	6.2
IC, 2 stage (s)	2.2	3.5	3.3	3.5	3.3	3.3
p0 queue free %	100	100	100	100	100	100
qM capacity (veh/h)	1401	779	862	779	862	862
Direction, Lane #						
Volume Total	EB 1					
Volume Left	156					
Volume Right	0					
ESH	11					
ESH	1700					
Volume to Capacity	0.09					
Queue Length 95th (m)	0.0					
Control Delay (s)	0.0					
Lane LOS	A					
Approach Delay (s)	0.0					
Approach LOS	A					
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	22.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 17: Oak Street & Site Driveway

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	130	0	0	10	0
Future Volume (Veh/h)	5	130	0	0	10	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	6	148	0	0	11	0
Pedestrians	5	5	5	5	25	5
Lane Width (m)	3.5	0.0	3.0	3.0	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	0	0	2	2
Right turn flare (veh)	None	None	None	None	None	None
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					190	30
VC, conflicting volume	25					
VC1, stage 1 conf vol						
VCu, unblocked vol	25				190	30
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
CM capacity (veh/h)	1572				785	1026
Direction, Lane #	EB 1	SB 1				
Volumes Total	154	11				
Volume Left	6	11				
Volume Right	0	0				
cSH	1572	785				
Volumes to Capacity	0.00	0.01				
Queue Length 95th (m)	0.1	0.3				
Control Delay (s)	0.3	9.6				
Lane LOS	A	A				
Approach Delay (s)	0.3	9.6				
Approach LOS	A	A				
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		22.4%			ICU Level of Service	A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 18: River Street & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Traffic Volume (veh/h)	85	5	50	20	0	50	0	435	40	50	550
Future Volume (Veh/h)	85	5	50	20	0	50	0	435	40	50	550
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	5	54	22	0	54	0	473	43	54	598
Pedestrians	75	75	5	45	45	50	50	3.5	3.5	3.5	5
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	7	7	7	4	4	4	4	4	4	4	0
Right turn flare (veh)											
Median type	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)											
Upstream signal (m)								143			151
pX platoon unblocked	0.85	0.85	0.80	0.85	0.85	0.90	0.80			0.90	
VC, conflicting volume	1334	1342	723	1352	1320	544	673			561	
VC1, stage 1 conf vol											
VC2, stage 2 conf vol											
VCu, unblocked vol	1047	1056	527	1068	1031	442	464			460	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1	
IC, 2 stage (s)											
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2	
p0 queue free %	29	97	86	81	100	90	100			94	
CM capacity (veh/h)	130	163	389	116	169	535	826			964	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1							
Volumes Total	151	76	516	652							
Volume Left	92	22	0	54							
Volume Right	54	54	43	0							
cSH	172	262	1700	964							
Volumes to Capacity	0.88	0.29	0.30	0.06							
Queue Length 95th (m)	48.1	8.9	0.0	1.4							
Control Delay (s)	93.5	24.3	0.0	1.5							
Lane LOS	F	C	A	A							
Approach Delay (s)	93.5	24.3	0.0	1.5							
Approach LOS	F	C	C	C							
Intersection Summary											
Average Delay			12.1								
Intersection Capacity Utilization			83.5%			ICU Level of Service					E
Analysis Period (min)			15								

19: Parliament Street & Cole Street

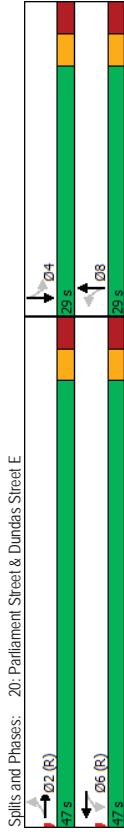
2032 Future Background PM Model (ExRN)  
03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	520	20	25	380
Future Volume (Veh/h)	0	0	520	20	25	380
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	619	24	30	452
Pedestrians	255	0	25	25	15	15
Lane Width (m)	0.0	0.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	2	2	1	1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.89	0.89	592	0.89	0.89	898
VC, conflicting volume	1197	592				
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	983	306				649
IC, single (s)	6.8	6.9				4.1
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IF (s)	100	100				96
CM capacity (veh/h)	210	614				846
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	413	230	181	301		
Volume Left	0	0	30	0		
Volume Right	0	24	0	0		
cSH	1700	1700	846	1700		
Volumes to Capacity	0.24	0.14	0.04	0.18		
Queue Length 95th (m)	0.0	0.0	0.8	0.0		
Control Delay (s)	0.0	0.0	1.9	0.0		
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.7			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			43.3%			ICU Level of Service A
Analysis Period (min)			15			

20: Parliament Street & Dundas Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	65	490	45	195	45	405	40	320
Future Volume (vph)	65	490	45	195	45	405	40	320
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4	
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Yellow Time (s)	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	61.8%	61.8%	61.8%	61.8%	61.8%	61.8%	38.2%	38.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)			5.0		5.0		5.0	
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.3	41.3	C-Min	C-Min	Min	Min	Min	Min
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.32	0.32	0.32	0.32
v/c Ratio	0.45	0.45	0.26	0.26	0.59	0.59	0.48	0.48
Control Delay	11.4	12.6	12.6	23.7	22.1	22.1	22.1	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	12.6	12.6	23.7	22.1	22.1	22.1	22.1
LOS	B	B	B	C	C	C	C	C
Approach Delay	11.4	12.6	12.6	23.7	22.1	22.1	22.1	22.1
Approach LOS	B	B	B	C	C	C	C	C
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 9 (12%) Referenced to phase 2:EBTL and 6:WBTL Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.59								
Intersection Signal Delay: 17.2								Intersection LOS: B
Intersection Capacity Utilization 93.3%								ICU Level of Service F
Analysis Period (min) 15								



Queues 2032 Future Background PM Model (ExRN) 03-22-2023

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN) 03-22-2023

20: Parliament Street & Dundas Street E

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	691	349	551	427
v/c Ratio	0.45	0.26	0.69	0.48
Control Delay	11.4	12.6	23.7	22.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	12.6	23.7	22.1
Queue Length 50th (m)	27.3	10.3	34.0	25.3
Queue Length 95th (m)	43.2	28.5	45.3	35.0
Internal Link Dist (m)	85.0	103.5	45.0	56.1
Turn Bay Length (m)				
Base Capacity (vph)	1557	1354	937	892
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.26	0.69	0.48

20: Parliament Street & Dundas Street E

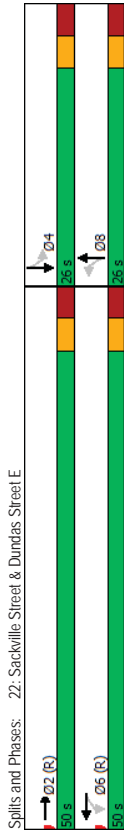
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4T		4T				4T			4T		
Traffic Volume (vph)	65	490	60	45	195	70	45	405	40	40	320	20	
Future Volume (vph)	65	490	60	45	195	70	45	405	40	40	320	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. 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	
Frbp. ped/bikes	0.98	0.98	0.98	0.94	0.94	0.98	0.98	0.98	0.98	0.98	0.99	0.99	
Frbp. psd/bikes	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Frt	0.99	0.99	0.99	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Flt Protected													
Satd. Flow (prot)	3205	3013	3272	3272	3013	3272	3272	3013	3272	3272	3013	3272	
Flt Permitted	0.87	0.87	0.87	0.80	0.80	0.87	0.87	0.87	0.87	0.87	0.85	0.85	
Satd. Flow (perm)	2799	2799	2434	2434	2799	2434	2799	2434	2799	2434	2732	2732	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
Adj. Flow (vph)	73	551	67	51	219	79	51	465	45	45	360	22	
RTOR Reduction (vph)	0	11	0	9	0	0	9	0	9	0	5	0	
Lane Group Flow (vph)	0	680	0	340	0	0	542	0	0	0	422	0	
Confl. Peds. (#/hr)	260	155	155	260	165	225	225	225	225	225	165	165	
Confl. Bikes (#/hr)	25	25	25	20	20	20	20	20	20	20	20	20	
Heavy Vehicles (%)	3%	6%	5%	5%	6%	6%	3%	5%	0%	3%	8%	10%	
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA	
Protected Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Permitted Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Actuated Green, G (s)	40.3	40.3	40.3	40.3	40.3	40.3	23.7	23.7	23.7	23.7	23.7	23.7	
Effective Green, g (s)	41.3	41.3	41.3	41.3	41.3	41.3	24.7	24.7	24.7	24.7	24.7	24.7	
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.32	0.32	0.32	0.32	0.32	0.32	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1521	1322	1322	928	928	928	887	887	887	887	887	887	
v/s Ratio Prot													
v/s Ratio Perm	0.24	0.14	0.14	0.14	0.14	0.19	0.15	0.15	0.15	0.15	0.15	0.15	
v/c Ratio	0.45	0.26	0.26	0.26	0.26	0.58	0.48	0.48	0.48	0.48	0.48	0.48	
Uniform Delay, d1	10.5	9.2	9.2	21.4	21.4	20.5	20.5	20.5	20.5	20.5	20.5	20.5	
Progression Factor	1.00	1.00	1.00	1.34	1.34	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.5	0.5	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Delay (s)	11.4	12.8	12.8	22.3	22.3	20.9	20.9	20.9	20.9	20.9	20.9	20.9	
Level of Service	B	B	B	C	C	C	C	C	C	C	C	C	
Approach Delay (s)	11.4	12.8	12.8	22.3	22.3	20.9	20.9	20.9	20.9	20.9	20.9	20.9	
Approach LOS	B	B	B	C	C	C	C	C	C	C	C	C	
Intersection Summary													
HCM 2000 Control Delay	16.6											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.3%											ICU Level of Service	F
Analysis Period (min)	15												
c Critical Lane Group													

03-22-2023  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 21: Regent Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	40	500	15	5	300	25	5	10	5	5	5	25
Traffic Volume (veh/h)	40	500	15	5	300	25	5	10	5	5	5	25
Future Volume (Veh/h)	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Sign Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Grade	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak Hour Factor	43	538	16	5	323	27	5	11	5	5	5	27
Hourly flow rate (vph)	30	3.5	3.5	10	125	135	3.5	3.5	1.1	1.1	1.1	12
Lane Width (m)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	3	1	1	1	1	1	1	1	1	1	1	1
Percent Blockage	None	None	None	None	None	None	None	None	None	None	None	None
Right turn flare (veh)	127	124	124	124	124	124	124	124	124	124	124	124
Median storage (veh)	485	679	679	679	679	679	679	679	679	679	679	679
Upstream signal (m)	485	556	556	556	556	556	556	556	556	556	556	556
pX platoon unblocked	4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
VC, conflicting volume	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
VC1, stage 1 conf vol	96	99	99	99	99	99	99	99	99	99	99	99
VC2, stage 2 conf vol	958	777	777	777	777	777	777	777	777	777	777	777
IC, single (s)	312	285	166	188	21	37	21	37	21	37	21	37
IC, 2 stage (s)	43	0	5	0	5	5	5	5	5	5	5	5
Volume Left	0	16	0	27	5	27	5	27	5	27	5	27
Volume Right	958	1700	777	1700	172	338	172	338	172	338	172	338
cSH	0.04	0.17	0.01	0.11	0.12	0.11	0.12	0.11	0.12	0.11	0.12	0.11
Volumes to Capacity	1.1	0.0	0.1	0.0	3.1	2.8	3.1	2.8	3.1	2.8	3.1	2.8
Queue Length 95th (m)	1.6	0.0	0.4	0.0	28.9	17.0	28.9	17.0	28.9	17.0	28.9	17.0
Control Delay (s)	A	A	A	A	D	C	D	C	D	C	D	C
Lane LOS	0.9	0.2	0.2	0.2	28.9	17.0	28.9	17.0	28.9	17.0	28.9	17.0
Approach Delay (s)	D C											
Approach LOS	D C											
Intersection Summary	Intersection LOS: A											
Average Delay	1.8											
Intersection Capacity Utilization	49.0%											
ICU Level of Service	A											
Analysis Period (min)	15											

03-22-2023  
 2032 Future Background PM Model (ExRN)  
 22: Sackville Street & Dundas Street E

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4
Traffic Volume (vph)	490	15	255	40	0	30	35
Future Volume (vph)	490	15	255	40	0	30	35
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	6	6	8	8	4	4
Permitted Phases	2	6	6	6	8	8	4
Detector Phase	2	6	6	6	8	8	4
Switch Phase	17.0	17.0	17.0	17.0	7.0	7.0	7.0
Minimum Initial (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Minimum Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (s)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Total Spill (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Lost Time Adjust (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lead-Lag Optimize?						
Lead-Lag	Recall Mode						
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Ad Effct Green (s)	47.6	47.6	47.6	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.24	0.24	0.24	0.24
v/C Ratio	0.27	0.27	0.27	0.23	0.23	0.23	0.23
Control Delay	5.1	7.0	7.0	13.2	13.2	17.1	17.1
Queue Delay	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Total Delay	5.1	7.2	7.2	13.2	13.2	17.1	17.1
LOS	A	A	A	B	B	B	B
Approach Delay	5.1	7.2	7.2	13.2	13.2	17.1	17.1
Approach LOS	A	A	A	B	B	B	B
Intersection Summary	Cycle Length: 76						
Cycle Length	Actuated Cycle Length: 76						
Offset	Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green						
Natural Cycle	Natural Cycle: 50						
Control Type	Control Type: Actuated-Coordinated						
Maximum v/C Ratio	Maximum v/C Ratio: 0.28						
Intersection Signal Delay	Intersection Signal Delay: 7.6						
Intersection Capacity Utilization	Intersection Capacity Utilization: 49.8%						
ICU Level of Service	ICU Level of Service: A						
Analysis Period (min)	Analysis Period (min): 15						





Queues 2032 Future Background PM Model (ExRN) 03-22-2023  
 22: Sackville Street & Dundas Street E

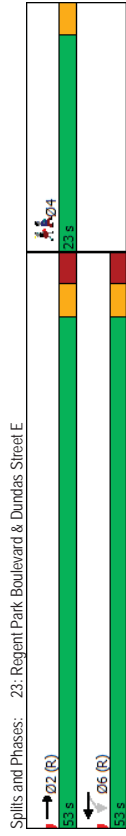
	EBT	WBT	NBT	SBT
Lane Group	559	290	75	108
Lane Group Flow (vph)	0.27	0.27	0.23	0.28
v/c Ratio	5.1	7.0	13.2	17.1
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	5.1	7.2	13.2	17.1
Total Delay	12.4	18.5	3.4	7.8
Queue Length 50th (m)	16.4	21.7	12.9	19.6
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2058	1063	369	434
Station Cap Reductn	0	313	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.39	0.20	0.25
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN) 03-22-2023  
 22: Sackville Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4					4				4
Traffic Volume (vph)	0	490	30	15	255	0	40	0	30	30	30	35
Future Volume (vph)	0	490	30	15	255	0	40	0	30	30	30	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.98	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.97	0.97	0.97
Frbp. psd/bikes	1.00	1.00	0.99	1.00	0.99	0.96	0.96	0.96	0.96	0.97	0.97	0.97
Frt	1.00	0.99	1.00	1.00	0.94	0.94	0.94	0.94	0.94	0.95	0.95	0.95
Flt Protected	1.00	1.00	1.00	1.00	0.97	0.97	0.97	0.97	0.97	0.99	0.99	0.99
Satd. Flow (prot)	3289	1756	1756	1494	1494	1494	1494	1494	1494	1618	1618	1618
Flt Permitted	1.00	0.96	0.96	0.80	0.80	0.80	0.80	0.80	0.80	0.90	0.90	0.90
Satd. Flow (perm)	3289	1697	1697	1226	1226	1226	1226	1226	1226	1478	1478	1478
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	527	32	16	274	0	43	0	32	32	38	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	559	0	0	290	0	42	0	42	0	0	81
Confl. Peds. (#/hr)	105	175	175	105	70	105	70	55	55	55	70	5
Confl. Bikes (#/hr)	0	35	35	20	20	20	20	20	20	20	20	20
Heavy Vehicles (%)	0%	5%	6%	0%	6%	0%	0%	0%	12%	0%	2%	5%
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	2	6	6	6	6	6	8	8	8	8	4	4
Permitted Phases												
Actuated Green, G (s)	46.6	46.6	46.6	46.6	46.6	46.6	17.4	17.4	17.4	17.4	17.4	17.4
Effective Green, g (s)	47.6	47.6	47.6	47.6	47.6	47.6	18.4	18.4	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.63	0.63	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2059	1062	1062	296	296	296	296	296	296	296	357	357
v/s Ratio Prot	0.17	0.17	0.17	0.17	0.17	0.17	0.03	0.03	0.03	0.03	0.05	0.05
v/s Ratio Perm	0.27	0.27	0.27	0.27	0.27	0.27	0.14	0.14	0.14	0.14	0.23	0.23
Uniform Delay, d1	6.4	6.4	6.4	6.4	6.4	6.4	22.6	22.6	22.6	22.6	23.1	23.1
Progression Factor	0.67	0.67	0.67	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3
Delay (s)	4.6	4.6	4.6	6.1	6.1	6.1	22.8	22.8	22.8	22.8	23.4	23.4
Level of Service	A	A	A	A	A	A	C	C	C	C	C	C
Approach Delay (s)	4.6	6.1	6.1	22.8	22.8	22.8	23.4	23.4	23.4	23.4	23.4	23.4
Approach LOS	A	A	A	A	A	A	C	C	C	C	C	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	8.3 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.26											
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 10.0											
Intersection Capacity Utilization	49.8% ICU Level of Service A											
Analysis Period (min)	15											
c Critical Lane Group												

Timings 2032 Future Background PM Model (ExRN) 03-22-2023  
 23: Regent Park Boulevard & Dundas Street E

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	520	15	270	4
Future Volume (vph)	520	15	270	4
Turn Type	NA	Perm	NA	NA
Protected Phases	2	6	6	4
Permitted Phases	2	6	6	6
Detector Phase				
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.9	4.9	4.9	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.42	0.22	0.22	
Control Delay	3.1	4.1	4.1	
Queue Delay	0.0	0.0	0.0	
Total Delay	3.2	4.1	4.1	
LOS	A	A	A	
Approach Delay	3.2	4.1	4.1	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 22 (29%), Referenced to phase 2EBT and 6WBT, Start of 1st Green				
Natural Cycle: 60				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.42				
Intersection Signal Delay: 3.5				
Intersection Capacity Utilization 49.2%				
Analysis Period (min) 15				



Queues 2032 Future Background PM Model (ExRN) 03-22-2023  
 23: Regent Park Boulevard & Dundas Street E

Lane Group	EBT	WBT
Lane Group Flow (vph)	618	320
v/c Ratio	0.42	0.22
Control Delay	3.1	4.1
Queue Delay	0.0	0.0
Total Delay	3.2	4.1
Queue Length 50th (m)	1.6	0.0
Queue Length 95th (m)	50.5	29.6
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1461	1452
Starvation Cap Reductn	36	133
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.43	0.24
<b>Intersection Summary</b>		

23: Regent Park Boulevard & Dundas Street E

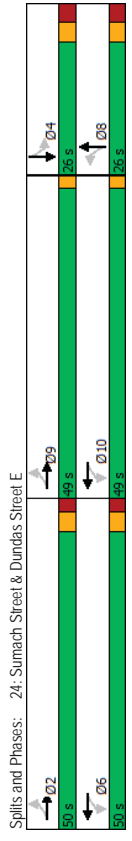
2032 Future Background PM Model (ExRN)  
03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4	4	4	4	4	4
Traffic Volume (vph)	520	30	15	270	0	0
Future Volume (vph)	520	30	15	270	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.97		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	0.99		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1710		1755			
Flt Permitted	1.00		0.96			
Sat'd Flow (perm)	1710		1698			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	584	34	17	303	0	0
RTOR Reduction (vph)	2	0	0	0	0	0
Lane Group Flow (vph)	616	0	0	320	0	0
Conf. Peds. (#/hr)	235	235	60	65		
Heavy Vehicles (%)	6%	6%	0%	6%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases	6		6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1352		1342			
v/s Ratio Prot	0.36		0.19			
v/s Ratio Perm	0.46		0.24			
Uniform Delay, d1	2.6		2.0			
Progression Factor	0.48		1.00			
Incremental Delay, d2	1.1		0.4			
Delay (s)	2.3		2.5			
Level of Service	A		A			
Approach Delay (s)	2.3		2.5	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.4 HCM 2000 Level of Service A					
HCM 2000 Volume to Capacity ratio	0.40					
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 7.9					
Intersection Capacity Utilization	49.2% ICU Level of Service A					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

2032 Future Background PM Model (ExRN)  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4	4
Traffic Volume (vph)	45	460	25	245	25	90	25	20
Future Volume (vph)	45	460	25	245	25	90	25	20
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2,9		6,10		8		4	
Detector Phase	2		6		8		4	
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	16.0	16.0	5.0
Minimum Split (s)	26.0	26.0	26.0	26.0	21.0	21.0	49.0	49.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	50.0	50.0	49.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	20.8%	40%	40%	39%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0
Lost Time Adjust (s)			-1.0		-1.0			
Total Lost Time (s)			5.0		5.0			
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	61.0		61.0		23.1		23.1	
Actuated g/C Ratio	0.65		0.65		0.25		0.25	
v/C Ratio	0.54		0.36		0.46		0.19	
Control Delay	9.3		6.7		40.2		33.4	
Queue Delay	1.8		0.0		0.0		0.0	
Total Delay	11.1		6.7		40.2		33.4	
LOS	B		A		D		C	
Approach Delay	11.1		6.7		40.2		33.4	
Approach LOS	B		A		D		C	
Intersection Summary								
Cycle Length: 125								
Actuated Cycle Length: 94.1								
Natural Cycle: 100								
Control Type: Actuated-Uncoordinated								
Maximum v/C Ratio: 0.54								
Intersection Signal Delay: 15.4								
Intersection Capacity Utilization 61.6%								
Analysis Period (min) 15								



Queues 2032 Future Background PM Model (ExRN) 03-22-2023  
 24: Sumach Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	559	349	172	65
Lane Group Flow (vph)	0.54	0.36	0.46	0.19
v/c Ratio	9.3	6.7	40.2	33.4
Control Delay	1.8	0.0	0.0	0.0
Queue Delay	11.1	6.7	40.2	33.4
Total Delay	43.1	21.2	28.5	9.0
Queue Length 50th (m)	62.7	32.8	55.5	22.9
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1220	1126	374	335
Station Cap Reductn	475	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.31	0.46	0.19
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN) 03-22-2023  
 24: Sumach Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4		4	4		4				
Traffic Volume (vph)	45	460	15	25	245	55	25	90	45	25	20	15
Future Volume (vph)	45	460	15	25	245	55	25	90	45	25	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frbp. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd. Flow (prot)	1699	1586	1586	1586	1586	1586	1586	1586	1586	1586	1586	1586
Flt Permitted	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Sat'd. Flow (perm)	1614	1502	1502	1502	1502	1502	1502	1502	1502	1502	1502	1502
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	48	495	16	27	263	59	27	97	48	27	22	16
RTOR Reduction (vph)	0	1	0	0	7	0	0	10	0	0	8	0
Lane Group Flow (vph)	0	558	0	342	0	0	162	0	0	0	57	0
Conf. Peds. (#/hr)	100	185	185	100	105	100	105	50	50	50	105	105
Conf. Bikes (#/hr)	25	25	25	20	20	20	20	20	20	20	20	20
Heavy Vehicles (%)	12%	6%	8%	0%	9%	5%	4%	5%	6%	0%	9%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2.9	6.10	6.10	8	8	8	8	8	8	8	8	8
Permitted Phases	2.9	6.10	6.10	8	8	8	8	8	8	8	8	8
Actuated Green, G (s)	63.5	63.5	63.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Effective Green, g (s)	64.5	64.5	64.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Actuated g/C Ratio	0.69	0.69	0.69	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1113	1036	1036	372	372	372	372	372	372	372	372	372
v/s Ratio Prot	60.35	0.23	0.23	60.11	60.11	60.11	60.11	60.11	60.11	60.11	60.11	60.11
v/c Ratio Perm	0.50	0.33	0.33	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
v/c Ratio	6.9	5.8	5.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.4	0.2	0.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Incremental Delay, d2	7.2	6.0	6.0	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6
Delay (s)	A	A	A	C	C	C	C	C	C	C	C	C
Level of Service	A	A	A	C	C	C	C	C	C	C	C	C
Approach Delay (s)	7.2	6.0	6.0	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6
Approach LOS	A	A	A	C	C	C	C	C	C	C	C	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	11.5 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.50											
Actuated Cycle Length (s)	93.5 Sum of lost time (s) 10.0											
Intersection Capacity Utilization	61.6% ICU Level of Service B											
Analysis Period (min)	15											
c Critical Lane Group												

25: Tubman Avenue & Dundas Street E

03-22-2023

2032 Future Background PM Model (ExRN)

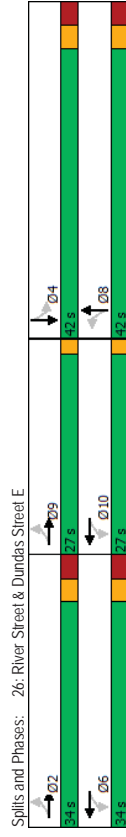
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	520	10	10	320	0	0	0	0	0	5	0
Future Volume (Veh/h)	0	520	10	10	320	0	0	0	0	0	5	0
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	0	547	11	11	337	0	0	0	0	5	0	5
Pedestrians	10			10			130			50		
Lane Width (m)	3.5			3.5			0.0			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	1			1			0			4		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	99			98								
pX platoon unblocked												
VC, conflicting volume	387			688			1056			1092		692
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	387			562			988			1028		567
IC, single (s)	4.1			4.1			7.1			6.2		7.1
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5			4.0		3.3
p0 queue free %	100			99			100			100		98
pM capacity (veh/h)	1130			882			186			193		452
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	558	348	10									
Volume Left	0	11	5									
Volume Right	11	0	5									
cSH	1130	882	313									
Volume to Capacity	0.00	0.01	0.03									
Queue Length 95th (m)	0.0	0.3	0.8									
Control Delay (s)	0.0	0.4	16.9									
Lane LOS	A	A	C									
Approach Delay (s)	0.0	0.4	16.9									
Approach LOS	C	C	C									
Intersection Summary												
Average Delay							0.3					
Intersection Capacity Utilization							42.6%					A
Analysis Period (min)							15					

26: River Street & Dundas Street E

03-22-2023

2032 Future Background PM Model (ExRN)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Configurations													
Traffic Volume (vph)	25	440	95	210	45	365	105	445					
Future Volume (vph)	25	440	95	210	45	365	105	445					
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA					
Protected Phases	2, 9		6, 10		8		4						
Permitted Phases	2	2	6	6	8	8	4	4					
Detector Phase													
Switch Phase													
Minimum Initial (s)					21.0	21.0	21.0	21.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)					27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)					42.0	42.0	42.0	42.0	42.0	42.0	42.0	34.0	27.0
Total Split (%)					40.8%	40.8%	40.8%	40.8%	40.8%	40.8%	33%	33%	26%
Yellow Time (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)					3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)					5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
Lead-Lag													
Lead-Lag Optimize?													
Recall Mode					Min	Min	Min	Min	Min	Min	Min	None	None
Act Effct Green (s)		31.8		31.8	37.7	37.7	37.7	37.7					
Actuated g/C Ratio		0.40		0.40	0.47	0.47	0.47	0.47					
v/C Ratio		0.82		0.85	0.20	0.79	0.58	0.71					
Control Delay		31.5		37.3	19.5	28.2	34.8	25.7					
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0					
Total Delay		31.5		37.3	19.5	28.2	34.8	25.7					
LOS		C		D	B	C	C	C					
Approach Delay		31.5		37.3	19.5	28.2	34.8	25.7					
Approach LOS		C		D	B	C	C	C					
Intersection Summary													
Cycle Length		103											
Actuated Cycle Length		79.7											
Natural Cycle		95											
Control Type		Actuated-Uncoordinated											
Maximum v/C Ratio		0.85											
Intersection Signal Delay		30.2											
Intersection Capacity Utilization		120.3%											
Analysis Period (min)		15											





Queues 2032 Future Background PM Model (ExRN) 03-22-2023  
 26: River Street & Dundas Street E

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	552	421	47	610	111	547
Lane Group Flow (vph)	0.82	0.85	0.20	0.79	0.58	0.71
v/c Ratio	31.5	37.3	19.5	28.2	34.8	25.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	31.5	37.3	19.5	28.2	34.8	25.7
Total Delay	70.0	52.4	3.6	64.4	10.6	56.6
Queue Length 50th (m)	103.3	86.0	16.6	#192.0	#49.6	#168.5
Queue Length 95th (m)	73.4	80.5		131.0		118.9
Internal Link Dist (m)			20.0		25.0	
Turn Bay Length (m)						
Base Capacity (vph)	711	523	230	777	193	769
Station Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.80	0.20	0.79	0.58	0.71

Intersection Summary  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN) 03-22-2023  
 26: River Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	440	60	95	210	95	45	365	215	105	445	75
Future Volume (vph)	25	440	60	95	210	95	45	365	215	105	445	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0						5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00						1.00	1.00		1.00	1.00	
Frbp. ped/bikes	0.98			0.97			1.00	0.94		1.00	0.98	
Frbp. psd/bikes	1.00			0.99			0.95	1.00		0.96	1.00	
Frt	1.00			0.99			1.00	0.94		1.00	0.98	
Flt Protected	1.00			0.97			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1724			1637			1532	1633		1591	1627	
Flt Permitted	0.97			0.73			0.29	1.00		0.23	1.00	
Satd. Flow (perm)	1676			1214			466	1633		393	1627	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	463	63	100	221	100	47	384	226	111	468	79
RTOR Reduction (vph)	0	5	0	0	13	0	0	17	0	0	5	0
Lane Group Flow (vph)	0	547	0	0	408	0	47	593	0	111	542	0
Confl. Peds. (#/hr)	55	75	75	75	75	55	75	75	75	75	75	5
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	9%	5%	0%	1%	9%	0%	5%	3%	0%	2%	12%	0%
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm
Protected Phases	2.9			6.10			8				4	
Permitted Phases	2.9			6.10			8				4	
Actuated Green, G (s)	36.5			36.5			36.7	36.7			36.7	36.7
Effective Green, g (s)	37.5			37.5			37.7	37.7			37.7	37.7
Actuated g/C Ratio	0.46			0.46			0.46	0.46			0.46	0.46
Clearance Time (s)							6.0	6.0			6.0	6.0
Vehicle Extension (s)							3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	774			560			216	758			182	755
v/s Ratio Prot							0.36				0.33	
v/s Ratio Perm	0.33			0.34			0.10				0.28	
v/c Ratio	0.71			0.73			0.22	0.78			0.61	0.72
Uniform Delay, d1	17.5			17.7			13.0	18.3			16.3	17.5
Progression Factor	1.00			1.00			1.00	1.00			1.00	1.00
Incremental Delay, d2	3.0			4.7			0.5	5.3			5.7	3.3
Delay (s)	20.4			22.4			13.5	23.6			21.9	20.8
Level of Service	C			C			B	C			C	C
Approach Delay (s)	20.4			22.4			22.8				21.0	
Approach LOS	C			C			C				C	C
Intersection Summary												
HCM 2000 Control Delay	21.6 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	81.2 Sum of lost time (s) 11.0											
Intersection Capacity Utilization	120.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 27: Dreamer's Way & Gerrard Street E

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (veh/h)	835	55	10	430	0	0
Future Volume (Veh/h)	835	55	10	430	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	879	58	11	453	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)	90			162		
Upstream signal (m)	0.87			0.87		0.87
pX platoon unblocked	937			1156		468
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	623			876		83
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)						
p0 queue free %	2.2			3.5		3.3
IF (s)	99			100		100
p0 capacity (veh/h)	840			250		839
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volumes Total	586	351	162	302		
Volume Left	0	0	11	0		
Volume Right	0	58	0	0		
cSH	1700	1700	840	1700		
Volumes to Capacity	0.34	0.21	0.01	0.18		
Queue Length 95th (m)	0.0	0.0	0.3	0.0		
Control Delay (s)	0.0	0.0	0.8	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0		0.3			
Approach LOS			A			
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	28.2%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (ExRN)  
 29: Sumach Street & Site Driveway

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑				↑	↑
Traffic Volume (veh/h)	10	5	95	0	0	40
Future Volume (Veh/h)	10	5	95	0	0	40
Sign Control	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	5	100	0	0	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		None
Median type						
Median storage (veh)						55
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	142		100			100
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	142		100			100
IC, single (s)	6.4		6.2			4.1
IC, 2 stage (s)						
p0 queue free %	3.5		3.3			2.2
IF (s)	99		99			100
p0 capacity (veh/h)	856		961			1505
Direction, Lane #	WB 1	NB 1	SB 1			
Volumes Total	16	100	42			
Volume Left	11	0	0			
Volume Right	5	0	0			
cSH	886	1700	1505			
Volumes to Capacity	0.02	0.06	0.00			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	9.1	0.0	0.0			
Lane LOS	A	A	A			
Approach Delay (s)	9.1	0.0	0.0			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay	0.9					
Intersection Capacity Utilization	15.0%					
ICU Level of Service	A					
Analysis Period (min)	15					

1: Parliament Street & Gerrard Street E (North Section)

03-22-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4TB	4TB	
Traffic Volume (veh/h)	0	0	5	550	500	60
Future Volume (Veh/h)	0	0	5	550	500	60
Sign Control	Free					
Grade	0%					
Peak Hour Factor	0.92					
Hourly flow rate (vph)	598					
Pedestrians	5					
Lane Width (m)	3.5					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	39					
dx platoon unblocked	0.93					
VC1, stage 1 conf vol	970					
VC2, stage 2 conf vol	384					
VC, conflicting volume	688					
VC1, stage 1 unblocked vol	817					
IC, single (s)	6.8					
IC, 2 stage (s)	3.5					
p0 queue free %	100					
CM capacity (veh/h)	293					
Direction, Lane #	NB 1		NB 2		SB 2	
Volumes Total	204		399		362	
Volume Left	5		0		0	
Volume Right	0		0		65	
cSH	791		1700		1700	
Volumes to Capacity	0.01		0.23		0.21	
Queue Length 95th (m)	0.1		0.0		0.0	
Control Delay (s)	0.3		0.0		0.0	
Lane LOS	A		A		A	
Approach Delay (s)	0.1		0.0		0.0	
Approach LOS	A		A		A	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	22.0%					
Analysis Period (min)	15					
ICU Level of Service	A					



2: Parliament Street & Gerrard Street E

03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		4TB		4TB		4TB		4TB
Traffic Volume (vph)	25	240	65	520	80	335	80	350
Future Volume (vph)	25	240	65	520	80	335	80	350
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases	4 11							
Permitted Phases	4 8 12							
Detector Phase	4 8 2 2 2 1 1 6							
Switch Phase	4 8 2 2 2 1 1 6							
Minimum Initial (s)	6.0							
Minimum Split (s)	12.5							
Total Split (s)	34.0							
Total Split (%)	11.2%							
Yellow Time (s)	3.3							
All-Red Time (s)	3.2							
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead Lag							
Recall Mode	Yes Yes							
Act Effct Green (s)	33.1		33.1		30.3		48.7	
Actuated g/C Ratio	0.36		0.36		0.33		0.53	
w/C Ratio	0.34		0.79		0.62		0.37	
Control Delay	20.7		31.9		29.8		13.4	
Queue Delay	0.0		0.0		0.0		0.0	
Total Delay	20.7		31.9		29.8		13.4	
LOS	C		C		C		B	
Approach Delay	20.7		31.9		29.8		13.4	
Approach LOS	C		C		C		B	
Intersection Summary								
Cycle Length	116							
Actuated Cycle Length	92.5							
Natural Cycle	115							
Control Type	Actuated-Uncoordinated							
Maximum w/C Ratio	0.79							
Intersection Signal Delay	25.2							
Intersection Capacity Utilization	99.7%							
Analysis Period (min)	15							



Timings  
2: Parliament Street & Gerrard Street E

2032 Future Background AM Model (FutRN)  
03-22-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	19.0	19.0	17.0	17.0
Total Split (s)	19.0	19.0	17.0	17.0
Total Split (%)	16%	16%	15%	15%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

Queues  
2: Parliament Street & Gerrard Street E

2032 Future Background AM Model (FutRN)  
03-22-2023

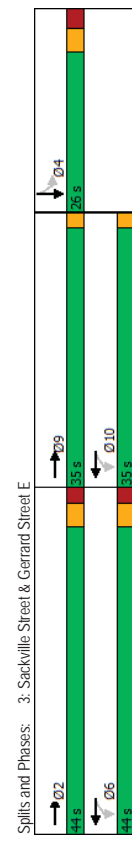
	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	358	820	484	526
v/c Ratio	0.34	0.79	0.62	0.37
Control Delay	20.7	31.9	29.8	13.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.7	31.9	29.8	13.4
Queue Length 50th (m)	18.1	54.3	33.0	21.4
Queue Length 95th (m)	37.8	101.8	61.0	43.9
Internal Link Dist (m)	33.0	63.9	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1055	1078	800	1446
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	0.34	0.76	0.60	0.36
Intersection Summary				

2. Parliament Street & Gerrard Street E 2032 Future Background AM Model (FutRN) 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Traffic Volume (vph)	25	240	75	65	520	195	80	335	45	80	350	70
Future Volume (vph)	25	240	75	65	520	195	80	335	45	80	350	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Lane Util. 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
Fpb, ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Frt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd Flow (prot)	3308	3203	3203	3203	3203	3203	3203	3203	3203	3203	3203	3203
FIL Permitted	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Sat'd Flow (perm)	2867	2867	2867	2867	2867	2867	2867	2867	2867	2867	2867	2867
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	253	79	68	547	205	84	353	47	84	368	74
RTOR Reduction (vph)	0	22	0	0	27	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	336	0	0	793	0	0	478	0	0	513	0
Conf. Peds. (#/hr)	80	85	85	85	80	85	120	120	120	120	120	85
Conf. Bikes (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	MA	Perm	NA	Perm	NA	Perm	NA	custom	MA	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10	6 10
Permitted Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10	6 10
Actuated Green, G (s)	37.5	37.5	37.5	40.3	40.3	53.6	53.6	53.6	53.6	53.6	53.6	53.6
Effective Green, g (s)	38.5	38.5	38.5	41.3	41.3	44.4	44.4	44.4	44.4	44.4	44.4	44.4
Actuated g/C Ratio	0.40	0.40	0.40	0.43	0.43	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1160	1143	1143	1037	1037	1264	1264	1264	1264	1264	1264	1264
v/s Ratio Prot	0.12	0.28	0.28	0.20	0.20	0.16	0.16	0.16	0.16	0.16	0.16	0.16
v/s Ratio Perm	0.29	0.69	0.69	0.46	0.46	0.41	0.41	0.41	0.41	0.41	0.41	0.41
v/c Ratio	19.1	23.4	23.4	19.0	19.0	16.7	16.7	16.7	16.7	16.7	16.7	16.7
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.1	1.8	1.8	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Incremental Delay, d2	19.2	25.3	25.3	19.4	19.4	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Level of Service	B	C	C	B	B	B	B	B	B	B	B	B
Approach Delay (s)	19.2	25.3	25.3	19.4	19.4	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Approach LOS	B	C	C	B	B	B	B	B	B	B	B	B
Intersection Summary	HCM 2000 Control Delay: 21.0 HCM 2000 Level of Service: C HCM 2000 Volume to Capacity ratio: 0.66 Actuated Cycle Length (s): 95.1 Sum of lost time (s): 22.5 Intersection Capacity Utilization: 99.7% ICU Level of Service: F Analysis Period (min): 15											

3. Sackville Street & Gerrard Street E 2032 Future Background AM Model (FutRN) 03-22-2023

Movement	EBT	WBL	WBT	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	4T	4T	4T	4T	Ø2	Ø6	Ø9	Ø10
Traffic Volume (vph)	330	105	830	35				
Future Volume (vph)	330	105	830	35				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.5	3.0	3.0	2.0	2.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Fpb, ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Fpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Frt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat'd Flow (prot)	3308	3203	3203	3203	3203	3203	3203	3203
FIL Permitted	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Sat'd Flow (perm)	2867	2867	2867	2867	2867	2867	2867	2867
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	253	79	68	547	205	84	353
RTOR Reduction (vph)	0	22	0	0	27	0	0	6
Lane Group Flow (vph)	0	336	0	0	793	0	0	478
Conf. Peds. (#/hr)	80	85	85	85	80	85	120	120
Conf. Bikes (#/hr)	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%
Turn Type	Perim	MA	MA	Perm	NA	Perm	NA	Perm
Protected Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10
Permitted Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10
Actuated Green, G (s)	37.5	37.5	37.5	40.3	40.3	53.6	53.6	53.6
Effective Green, g (s)	38.5	38.5	38.5	41.3	41.3	44.4	44.4	44.4
Actuated g/C Ratio	0.40	0.40	0.40	0.43	0.43	0.47	0.47	0.47
Clearance Time (s)								
Vehicle Extension (s)								
Lane Grp Cap (vph)	1160	1143	1143	1037	1037	1264	1264	1264
v/s Ratio Prot	0.12	0.28	0.28	0.20	0.20	0.16	0.16	0.16
v/s Ratio Perm	0.29	0.69	0.69	0.46	0.46	0.41	0.41	0.41
v/c Ratio	19.1	23.4	23.4	19.0	19.0	16.7	16.7	16.7
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.1	1.8	1.8	0.3	0.3	0.2	0.2	0.2
Incremental Delay, d2	19.2	25.3	25.3	19.4	19.4	16.9	16.9	16.9
Level of Service	B	C	C	B	B	B	B	B
Approach Delay (s)	19.2	25.3	25.3	19.4	19.4	16.9	16.9	16.9
Approach LOS	B	C	C	B	B	B	B	B
Intersection Summary	Cycle Length: 105 Actuated Cycle Length: 81.3 Natural Cycle: 85 Control Type: Actuated-Uncoordinated Maximum v/c Ratio: 0.60 Intersection Signal Delay: 10.7 Intersection Capacity Utilization: 66.6% Analysis Period (min): 15							





Queues  
3. Sackville Street & Gerrard Street E

2032 Future Background AM Model (FutRN)  
03-22-2023

	EBT	WBT	SBT
Lane Group	390	1027	114
Lane Group Flow (vph)	0.20	0.60	0.26
v/c Ratio	6.0	10.2	31.6
Control Delay	0.0	0.0	0.0
Queue Delay	6.0	10.2	31.6
Total Delay	11.1	42.3	16.3
Queue Length 50th (m)	15.7	54.8	35.3
Queue Length 95th (m)	56.3	47.8	15.3
Internal Link Dist (m)			
Turn Bay Length (m)	2273	2024	438
Base Capacity (vph)	0	0	0
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.51	0.26
<b>Intersection Summary</b>			

HCM Signalized Intersection Capacity Analysis  
3. Sackville Street & Gerrard Street E

2032 Future Background AM Model (FutRN)  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4↑	4↑		4↑						4↑	
Traffic Volume (vph)	0	330	25	105	830	0	0	0	0	55	35	15
Future Volume (vph)	0	330	25	105	830	0	0	0	0	55	35	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.0	4.0									4.7	
Lane Util. Factor		0.95			0.95						1.00	
Frbp. ped/bikes		0.99			1.00						0.99	
Frbp. ped/bikes		1.00			0.99						0.91	
Frt		0.99			1.00						0.98	
Frt Protected		1.00			0.99						0.97	
Sat'd. Flow (prot)		3192			3361						1569	
Flt Permitted		1.00			0.84						0.97	
Sat'd. Flow (perm)		3192			2850						1569	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	363	27	115	912	0	0	0	0	60	38	16
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	384	0	0	1027	0	0	0	0	0	109	0
Confl. Peds. (#/hr)	40	60	60	60	40	60	140	140	60	140	60	5
Confl. Bikes (#/hr)	0%	10%	0%	9%	4%	0%	0%	0%	0%	0%	6%	6%
Heavy Vehicles (%)												
Turn Type	NA	Perm	NA	NA	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2.9			6.10						4		
Permitted Phases				6.10								
Actuated Green, G (s)	52.2			52.2						21.8		
Effective Green, g (s)	53.2			53.2						22.8		
Actuated g/C Ratio	0.65			0.65						0.28		
Clearance Time (s)											5.7	
Vehicle Extension (s)											3.0	
Lane Grp Cap (vph)	2078			1855						437		
v/s Ratio Prot	0.12											
v/s Ratio Perm				0.36						0.07		
v/c Ratio	0.18			0.55						0.25		
Uniform Delay, d1	5.7			7.8						22.8		
Progression Factor	1.00			1.00						1.00		
Incremental Delay, d2	0.0			0.4						0.3		
Delay (s)	5.7			8.1						23.1		
Level of Service	A			A						C		
Approach Delay (s)	5.7			8.1			0.0			23.1		
Approach LOS	A			A			A			C		
<b>Intersection Summary</b>												
HCM 2000 Control Delay			8.6			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			81.7			Sum of lost time (s)				9.7		
Intersection Capacity Utilization			66.6%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 4: Gerrard Street E & Gifford Street

03-22-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	1↑		W	
Traffic Volume (veh/h)	5	380	930	20	5	5
Future Volume (Veh/h)	5	380	930	20	5	5
Sign Control		Free	Free	Stop	Stop	
Grade		0%	0%	0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	396	969	21	5	5
Pedestrians		5	5		50	
Lane Width (m)		3.5	3.5	3.0		
Walking Speed (m/s)		1.1	1.1	1.1		
Percent Blockage		0	0		4	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
PX platoon unblocked	0.91			0.92	0.91	
VC conflicting volume	1040			1242	550	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	841			982	301	
IC single (s)	4.1			7.5	7.3	
IC 2 stage (s)						
p0 queue free %	2.2			3.8	3.5	
IF (s)	99			97	99	
CM capacity (veh/h)	701			173	560	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	137	264	646	344	10	
Volume Left	5	0	0	0	5	
Volume Right	0	0	0	21	5	
cSH	701	1700	1700	1700	264	
Volumes to Capacity	0.01	0.16	0.38	0.20	0.04	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.9	
Control Delay (s)	0.4	0.0	0.0	0.0	19.2	
Lane LOS	A				C	
Approach Delay (s)	0.2		0.0		19.2	
Approach LOS					C	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			38.0%		ICU Level of Service	
Analysis Period (min)			15		A	

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 5: Gerrard Street E & Nasmith Avenue

03-22-2023

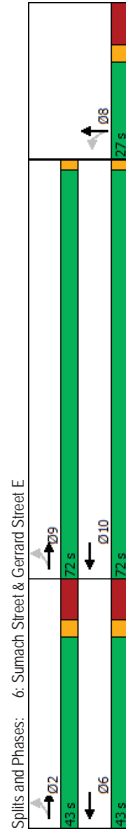


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	1↑		W	
Traffic Volume (veh/h)	5	380	940	5	15	10
Future Volume (Veh/h)	5	380	940	5	15	10
Sign Control		Free	Free	Stop	Stop	
Grade		0%	0%	0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	392	969	5	15	10
Pedestrians					75	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					6	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
PX platoon unblocked	0.89			0.89	0.89	0.89
VC conflicting volume	1049			1252	562	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	797			1027	248	
IC single (s)	4.1			6.9	7.1	
IC 2 stage (s)						
p0 queue free %	2.2			3.6	3.4	
IF (s)	99			92	98	
CM capacity (veh/h)	696			184	609	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	136	261	646	328	25	
Volume Left	5	0	0	0	15	
Volume Right	0	0	0	5	10	
cSH	696	1700	1700	1700	255	
Volumes to Capacity	0.01	0.15	0.38	0.19	0.10	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.4	
Control Delay (s)	0.5	0.0	0.0	0.0	20.6	
Lane LOS	A				C	
Approach Delay (s)	0.2		0.0		20.6	
Approach LOS					C	
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			36.2%		ICU Level of Service	
Analysis Period (min)			15		A	

Timings 2032 Future Background AM Model (FutRN) 03-22-2023

6: Summach Street & Gerrard Street E

	EBL	EBT	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Group								
Lane Configurations								
Traffic Volume (vph)	5	390	905	10				
Future Volume (vph)	5	390	905	10				
Turn Type	Perm	NA	NA	NA				
Protected Phases		2, 9	6, 10	8	2	6	9	10
Permitted Phases	2, 9							
Detector Phase	2	2	6	8				
Switch Phase								
Minimum Initial (s)				15.0	11.0	5.0	5.0	
Minimum Split (s)				25.4	26.2	72.0	72.0	
Total Split (s)				27.0	43.0	72.0	72.0	
Total Split (%)				19.0%	30%	51%	51%	
Yellow Time (s)				3.0	3.0	2.0	2.0	
All-Red Time (s)				7.4	7.2	0.0	0.0	
Lost Time Adjust (s)				-1.0				
Total Lost Time (s)				9.4				
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode				None	Min	None	None	
Act Effct Green (s)		69.1	69.1	19.0				
Actuated g/C Ratio		0.71	0.71	0.20				
v/c Ratio		0.20	0.51	0.32				
Control Delay		6.6	8.9	43.2				
Queue Delay		0.0	0.1	0.0				
Total Delay		6.6	9.0	43.2				
LOS		A	A	D				
Approach Delay		6.6	9.0	43.2				
Approach LOS		A	A	D				
Intersection Summary								
Cycle Length: 142								
Actuated Cycle Length: 96.8								
Natural Cycle: 125								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.51								
Intersection Signal Delay: 10.2								
Intersection Capacity Utilization: 58.1%								
Analysis Period (min): 15								



Queues 2032 Future Background AM Model (FutRN) 03-22-2023

6: Summach Street & Gerrard Street E

	EBT	WBT	NBT
Lane Group	454	1184	91
Lane Group Flow (vph)	0.20	0.51	0.32
v/c Ratio	0.20	0.51	0.32
Control Delay	6.6	8.9	43.2
Queue Delay	0.0	0.1	0.0
Total Delay	6.6	9.0	43.2
Queue Length 50th (m)	16.8	57.4	8.0
Queue Length 95th (m)	22.2	68.8	36.5
Internal Link Dist (m)	44.0	75.7	33.2
Turn Bay Length (m)			
Base Capacity (vph)	2276	2325	307
Starvation Cap Reductn	0	255	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.20	0.57	0.30
Intersection Summary			

6: Sumach Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1		4+1				4				
Traffic Volume (vph)	5	390	0	0	905	125	40	10	30	0	0	0
Future Volume (vph)	5	390	0	0	905	125	40	10	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp, ped/bikes	1.00			0.97			0.95					
Frbp, ped/bikes	1.00			1.00			0.90					
Frt	1.00			0.98			0.95					
Flt Protected	1.00			1.00			0.98					
Sat'd Flow (prot)	3398			3277			1482					
Flt Permitted	0.94			1.00			0.98					
Sat'd Flow (perm)	3188			3277			1482					
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	448	0	0	1040	144	46	11	34	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	454	0	0	1177	0	0	76	0	0	0	0
Confl. Peds. (#/hr)	65	85	85	65	100	65	100	65	65	65	100	100
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perim	MA	NA	NA	Perm	NA	NA	NA	NA	NA	NA	NA
Protected Phases		2.9		6.10			8					
Permitted Phases		2.9					8					
Effective Green, G (s)		74.3		74.3			12.2					
Actuated Green, g (s)		75.3		75.3			13.2					
Actuated g/C Ratio		0.76		0.76			0.13					
Clearance Time (s)							10.4					
Vehicle Extension (s)							3.0					
Lane Grp Cap (vph)		2427		2495			197					
v/s Ratio Prot				c0.36								
v/s Ratio Perm		0.14					0.05					
v/c Ratio		0.19		0.47			0.39					
Uniform Delay, d1		3.3		4.4			39.2					
Progression Factor		1.00		1.00			1.00					
Incremental Delay, d2		0.0		0.1			1.3					
Delay (s)		3.3		4.5			40.4					
Level of Service		A		A			D					
Approach Delay (s)		3.3		4.5			40.4					0.0
Approach LOS		A		A			D					A
Intersection Summary												
HCM 2000 Control Delay				6.1			HCM 2000 Level of Service					A
HCM 2000 Volume to Capacity ratio				0.50								
Actuated Cycle Length (s)				98.9			Sum of lost time (s)					19.6
Intersection Capacity Utilization				58.1%			ICU Level of Service					B
Analysis Period (min)				15								
c Critical Lane Group												

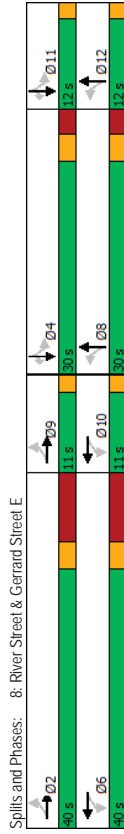
7: Street J/Sword Street & Gerrard Street E  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1		4+1				4				
Traffic Volume (veh/h)	0	415	5	0	1025	0	0	0	0	10	0	5
Future Volume (Veh/h)	0	415	5	0	1025	0	0	0	0	10	0	5
Sign Control		Free		Free				Stop				Stop
Grade		0%		0%				0%				0%
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
Hourly flow rate (vph)	0	437	5	0	1079	0	0	0	0	11	0	5
Pedestrians												75
Lane Width (m)												3.0
Walking Speed (m/s)												1.1
Percent Blockage												6
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (m)		100		91								
pX, platoon unblocked	0.80		0.99				0.80	0.80	0.99	0.80	0.80	0.80
vC, conflicting volume	1154		442				984	1594	221	1372	1596	614
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCU, unblocked vol	691		414				435	1192	190	917	1195	16
IC, single (s)	4.1		4.1				7.5	6.5	6.9	7.5	6.5	6.9
IC, 2 stage (s)												
IF (s)	2.2		2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100		100				100	100	100	93	100	99
dM capacity (veh/h)	689		1143				390	143	816	167	143	803
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1							
Volumes Total	291	151	360	719	16							
Volume Left	0	0	0	0	11							
Volume Right	0	5	0	0	5							
cSH	1700	1700	1143	1700	222							
Volumes to Capacity	0.17	0.09	0.00	0.42	0.07							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.8							
Control Delay (s)	0.0	0.0	0.0	0.0	22.5							
Lane LOS					C							
Approach Delay (s)	0.0		0.0		22.5							
Approach LOS					C							
Intersection Summary												
Average Delay				0.2								
Intersection Capacity Utilization				38.3%								A
Analysis Period (min)				15								

Timings  
8: River Street & Gerrard Street E

2032 Future Background AM Model (FutRN)  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations												
Traffic Volume (vph)	110	275	160	815	45	365	125	365	165			
Future Volume (vph)	110	275	160	815	45	365	125	365	165			
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	2 9	6 10	6 10	8 12	4 11	4 11	4 11	4 11	4 11	2	4	6
Permitted Phases	2	2	6	6	8	8	4	4	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)										23.0	19.0	23.0
Minimum Split (s)										33.8	30.0	33.8
Total Split (s)										40.0	30.0	40.0
Total Split (%)										43%	32%	43%
Yellow Time (s)										3.0	3.0	3.0
All-Red Time (s)										7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode										Min	Min	Min
Act Effct Green (s)	36.8	36.8	29.9	29.9	29.9	29.9	29.9	29.9	29.9			
Actuated g/C Ratio	0.45	0.45	0.37	0.37	0.37	0.37	0.37	0.37	0.37			
v/C Ratio	1.02	1.02	0.71	0.71	0.64	0.56	0.29					
Control Delay	20.8	55.3	20.8	28.7	38.2	24.6	8.6					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	20.8	55.3	20.8	28.7	38.2	24.6	8.6					
LOS	C	E	C	C	D	C	A					
Approach Delay	20.8	55.3	28.0	23.2								
Approach LOS	C	E	C	C								
Intersection Summary												
Cycle Length: 93												
Actuated Cycle Length: 81.9												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/C Ratio: 1.02												
Intersection Signal Delay: 37.3												
Intersection Capacity Utilization: 117.6%												
Analysis Period (min): 15												



Timings  
8: River Street & Gerrard Street E

2032 Future Background AM Model (FutRN)  
03-22-2023

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Split (s)	30.0	11.0	11.0	12.0	12.0
Total Split (s)	30.0	11.0	11.0	12.0	12.0
Total Split (%)	32%	12%	12%	13%	13%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode					
Act Effct Green (s)	Min	None	None	None	None
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					



Queues 8: River Street & Gerrard Street E 2032 Future Background AM Model (FutRN) 03-22-2023

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	443	1204	47	453	130	380	172
Lane Group Flow (vph)	0.58	1.02	0.19	0.71	0.64	0.56	0.29
v/c Ratio	20.8	55.3	20.8	28.7	38.2	24.6	8.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	20.8	55.3	20.8	28.7	38.2	24.6	8.6
Total Delay	26.5	100.3	5.4	62.8	17.9	50.4	6.3
Queue Length 50th (m)	45.2	#161.7	13.2	95.6	38.9	76.7	19.2
Queue Length 95th (m)	67.0	81.6		126.5		61.7	
Internal Link Dist (m)			30.0				
Turn Bay Length (m)	740	1181	252	668	213	708	609
Base Capacity (vph)	0	0	0	0	0	0	0
Stavation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.02	0.19	0.68	0.61	0.54	0.28

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN) 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4TB			4TB								
Traffic Volume (vph)	110	275	40	160	815	180	45	365	70	125	365	165	
Future Volume (vph)	110	275	40	160	815	180	45	365	70	125	365	165	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	9.8	9.8	9.8	9.8	9.8	9.8	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	1.00	0.98	1.00	0.96	1.00	0.94	
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.96	1.00	1.00	0.85	
Frt	0.99	0.99	0.99	0.99	0.99	0.99	1.00	0.98	1.00	0.95	1.00	0.85	
Flt Protected													
Satd. Flow (prot)	3189	3261	3261	1528	1738	1528	1738	1528	1738	1577	1860	1420	
Flt Permitted	0.52	0.52	0.52	0.79	0.79	0.79	0.41	1.00	0.34	1.00	1.00	1.00	
Satd. Flow (perm)	1684	1684	1684	2601	2601	2601	665	1738	562	1860	1420	1420	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	115	286	42	167	849	188	47	380	73	130	380	172	
RTOR Reduction (vph)	0	7	0	0	13	0	0	7	0	0	0	67	
Lane Group Flow (vph)	0	436	0	0	1191	0	47	446	0	130	380	105	
Confl. Peds. (#/hr)	50	95	95	50	50	40	85	85	40	85	85	40	
Confl. Bikes (#/hr)	10	15	15	10	10	10	15	15	10	15	15	10	
Heavy Vehicles (%)	4%	8%	4%	0%	3%	1%	8%	4%	2%	3%	1%	0%	
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	
Protected Phases	2.9	6.10	6.10	8.12	8.12	8.12	4.11	4.11	4.11	4.11	4.11	4.11	
Permitted Phases	2.9	6.10	6.10	8.12	8.12	8.12	4.11	4.11	4.11	4.11	4.11	4.11	
Actuated Green, G (s)	45.5	45.5	45.5	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	33.8	
Effective Green, g (s)	46.5	46.5	46.5	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	
Actuated g/C Ratio	0.56	0.56	0.56	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)													
Vehicle Extension (s)													
Lane Grp Cap (vph)	940	1451	1451	277	726	726	234	777	234	777	593	593	
v/s Ratio Prot				c0.26	c0.26	c0.26						0.20	
v/s Ratio Perm	0.26	c0.46	0.07	0.17	0.61	0.61	0.23	0.23	0.23	0.23	0.23	0.07	
v/c Ratio	0.46	0.82	0.82	0.17	0.61	0.61	0.56	0.49	0.56	0.49	0.56	0.18	
Uniform Delay, d1	11.0	15.0	15.0	19.0	18.4	17.7	15.2	15.2	15.2	15.2	15.2	15.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	3.9	3.9	0.3	1.6	1.6	2.8	0.5	2.8	0.5	0.1	0.1	
Delay (s)	11.3	18.9	18.9	15.5	20.5	20.5	21.2	18.2	21.2	18.2	15.4	15.4	
Level of Service	B	B	B	B	C	C	C	B	C	C	B	B	
Approach Delay (s)	11.3	18.9	18.9	20.1	20.1	20.1	18.1	18.1	18.1	18.1	18.1	18.1	
Approach LOS	B	B	B	C	C	C	B	B	C	C	B	B	
Intersection Summary													
HCM 2000 Control Delay	17.7											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86												
Actuated Cycle Length (s)	83.3											Sum of lost time (s)	16.8
Intersection Capacity Utilization	117.6%											ICU Level of Service	H
Analysis Period (min)	15												
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 9: Sackville Street & Site Driveway

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	5	10	10	5	0	0	0	0	15	145	5
Future Volume (Veh/h)	0	5	10	10	5	0	0	0	0	15	145	5
Sign Control	Stop	0%	Stop	0%	Stop	0%	Free	0%	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	0	6	13	13	6	0	0	0	0	19	188	6
Pedestrians	70						15					10
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	6						4					1
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	312	339	276	300	342	50	264					40
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	312	339	276	300	342	50	264					40
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	100	99	98	98	99	100	100					99
CM capacity (veh/h)	546	523	720	566	521	979	1231					1527
Direction, Lane #	EB 1	WB 1	SB 1									
Volumes Total	19	19	213									
Volume Left	0	13	19									
Volume Right	13	0	6									
cSH	644	551	1527									
Volumes to Capacity	0.03	0.03	0.01									
Queue Length 95th (m)	0.7	0.8	0.3									
Control Delay (s)	10.8	11.8	0.8									
Lane LOS	B	B	A									
Approach Delay (s)	10.8	11.8	0.8									
Approach LOS	B	B	A									
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			31.4%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 10: Parliament Street & Oak Street

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	65	395	10	15	475
Future Volume (Veh/h)	45	65	395	10	15	475
Sign Control	Stop	0%	Free	0%	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	68	416	11	16	500
Pedestrians	260			5		175
Lane Width (m)	3.0	3.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	20			0		15
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			151			143
pX platoon unblocked	0.99	0.99			0.99	
VC, conflicting volume	968	648			687	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	898	628			666	
IC, single (s)	6.8	7.0			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	78	76			98	
CM capacity (veh/h)	218	282			742	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	115	277	150	183	333	
Volume Left	47	0	0	16	0	
Volume Right	68	0	11	0	0	
cSH	252	1700	1700	742	1700	
Volumes to Capacity	0.46	0.16	0.09	0.02	0.20	
Queue Length 95th (m)	17.0	0.0	0.0	0.5	0.0	
Control Delay (s)	30.8	0.0	0.0	1.1	0.0	
Lane LOS	D	B	A	A	A	
Approach Delay (s)	30.8	0.0		0.4		
Approach LOS	D					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			44.0%			A
Analysis Period (min)			15			

11: Oak Street & Dreamer's Way

12: Regent Street & Oak Street

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	25	65	0	5	50
Future Volume (Veh/h)	0	25	65	0	5	50
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	30	79	0	6	61
Pedestrians	15				40	
Lane Width (m)	3.5				3.0	
Walking Speed (m/s)	1.1				1.1	
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume	119				149	134
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	119				149	134
IC single (s)	4.1				6.4	6.3
IC 2 stage (s)	2.2				3.5	3.4
p0 queue free %	100				99	93
CM capacity (veh/h)	1437				822	851
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	30	79	67			
Volume Left	0	0	6			
Volume Right	0	0	61			
cSH	1700	1700	848			
Volumes to Capacity	0.02	0.05	0.08			
Queue Length 95th (m)	0.0	0.0	2.0			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			26.9%			ICU Level of Service A
Analysis Period (min)			15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	30	0	0	35	30	25
Future Volume (Veh/h)	30	0	0	35	30	25
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	38	0	0	45	38	32
Pedestrians	15				10	30
Lane Width (m)	3.5				3.5	3.0
Walking Speed (m/s)	1.1				1.1	1.1
Percent Blockage	1				1	2
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume			68		128	78
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol			68		128	78
IC single (s)			4.1		6.4	6.2
IC 2 stage (s)			2.2		3.5	3.3
p0 queue free %			100		95	97
CM capacity (veh/h)			1511		831	947
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	38	45	70			
Volume Left	0	0	38			
Volume Right	0	0	32			
cSH	1700	1700	880			
Volumes to Capacity	0.02	0.03	0.08			
Queue Length 95th (m)	0.0	0.0	2.0			
Control Delay (s)	0.0	0.0	9.4			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.4			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			26.9%			ICU Level of Service A
Analysis Period (min)			15			

14: Sackville Street & Oak Street

15: Sumach Street & Oak Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop											
Traffic Volume (vph)	0	35	10	0	20	0	0	0	0	25	130	5
Future Volume (vph)	0	35	10	0	20	0	0	0	0	25	130	5
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
Hourly flow rate (vph)	0	43	12	0	25	0	0	0	0	31	160	6
Direction, Lane #												
	EB 1	WB 1	SB 1									
Volume Total (vph)	55	25	197									
Volume Left (vph)	0	0	31									
Volume Right (vph)	12	0	6									
Head (s)	-0.03	0.00	0.11									
Departure Headway (s)	4.3	4.4	4.2									
Degree Utilization, x	0.07	0.03	0.23									
Capacity (veh/h)	789	765	836									
Control Delay (s)	7.7	7.6	8.4									
Approach Delay (s)	7.7	7.6	8.4									
Approach LOS	A	A	A									
Intersection Summary												
Delay	8.2											
Level of Service	A											
Intersection Capacity Utilization	32.7%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop											
Traffic Volume (vph)	30	20	10	0	0	0	20	55	35	0	0	0
Future Volume (vph)	30	20	10	0	0	0	20	55	35	0	0	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	40	27	13	0	0	0	27	73	47	0	0	0
Direction, Lane #												
	EB 1	NB 1										
Volume Total (vph)	80	147										
Volume Left (vph)	40	27										
Volume Right (vph)	13	47										
Head (s)	0.08	-0.05										
Departure Headway (s)	4.3	4.0										
Degree Utilization, x	0.10	0.16										
Capacity (veh/h)	807	868										
Control Delay (s)	7.8	7.8										
Approach Delay (s)	7.8	7.8										
Approach LOS	A	A										
Intersection Summary												
Delay	7.8											
Level of Service	A											
Intersection Capacity Utilization	32.1%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 16: Tubman Avenue/Street 'J' & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	55	0	0	0	0	0	0	0	0	0	5
Future Volume (Veh/h)	0	55	0	0	0	0	0	0	0	0	0	5
Sign Control	Free											
Grade	0%											
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	73	0	0	0	0	0	0	0	0	0	7
Pedestrians	40											
Lane Width (m)	3.5											
Walking Speed (m/s)	1.1											
Percent Blockage	4											
Right turn flare (veh)	None											
Median type	None											
Median storage (veh)	None											
Upstream signal (m)	None											
pX platoon unblocked	0											
VC conflicting volume	0	118	0	118	118	128	83	118	40	0	0	0
VC1 stage 1 conf vol	0											
VC2 stage 2 conf vol	4.1											
VCu unblocked vol	0	118	0	118	118	128	83	118	40	0	0	0
IC single (s)	4.1	4.1	4.1	7.1	6.5	6.7	7.1	6.5	6.2	4.1	4.1	4.1
IC 2 stage (s)	2.2											
IF (s)	2.2											
p0 queue free %	100											
CM capacity (veh/h)	1636	1483	1483	774	776	808	909	776	1000	1636	1483	1483
Direction_Lane #	EB 1	SB 1										
Volumes Total	73	7										
Volume Left	0	0										
Volume Right	0	0										
cSH	1700	776										
Volumes to Capacity	0.04	0.01										
Queue Length 95th (m)	0.0	0.2										
Control Delay (s)	0.0	9.7										
Lane LOS	A	A										
Approach Delay (s)	0.0	9.7										
Approach LOS	A	A										
Intersection Summary												
Average Delay	0.8											
Intersection Capacity Utilization	28.5%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 17: Oak Street & Site Driveway

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (veh/h)	5	50	0	0	0	0	5	0	0
Future Volume (Veh/h)	5	50	0	0	0	0	5	0	0
Sign Control	Free								
Grade	0%								
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	56	0	0	0	0	6	0	0
Pedestrians	10								
Lane Width (m)	3.0								
Walking Speed (m/s)	1.1								
Percent Blockage	0								
Right turn flare (veh)	None								
Median type	None								
Median storage (veh)	None								
Upstream signal (m)	None								
pX platoon unblocked	10								
VC conflicting volume	10	88	10	88	10	10	88	10	10
VC1 stage 1 conf vol	10								
VC2 stage 2 conf vol	4.1								
VCu unblocked vol	10	88	10	88	10	10	88	10	10
IC single (s)	4.1	4.1	4.1	6.4	6.2	6.4	6.2	4.1	4.1
IC 2 stage (s)	2.2								
IF (s)	2.2								
p0 queue free %	100								
CM capacity (veh/h)	1610	1610	1610	907	907	907	907	1069	1610
Direction_Lane #	EB 1	SB 1							
Volumes Total	62	6							
Volume Left	6	6							
Volume Right	0	0							
cSH	1610	907							
Volumes to Capacity	0.00	0.01							
Queue Length 95th (m)	0.1	0.2							
Control Delay (s)	0.7	9.0							
Lane LOS	A	A							
Approach Delay (s)	0.7	9.0							
Approach LOS	A	A							
Intersection Summary									
Average Delay	1.5								
Intersection Capacity Utilization	16.8%								
ICU Level of Service	A								
Analysis Period (min)	15								

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
18: River Street & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	15	35	0	65	0	375	25	40	525	0
Future Volume (Veh/h)	40	0	15	35	0	65	0	375	25	40	525	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	44	0	16	38	0	71	0	412	27	44	577	0
Pedestrians	75			65			35				5	
Lane Width (m)	3.5			3.5			3.5				3.5	
Walking Speed (m/s)	1.1			1.1			1.1				1.1	
Percent Blockage	7			6			3				0	
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (m)							143					151
pX platoon unblocked	0.87	0.87	0.85	0.87	0.87	0.79	0.85			0.79		
VC, conflicting volume	1242	1244	687	1206	1230	496	652			504		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	810	812	543	769	797	229	501			240		
IC, single (s)	7.2	6.5	6.2	7.1	7.0	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.6	4.0	3.3	3.5	4.5	3.3	2.2			2.2		
p0 queue free %	76	100	96	82	100	88	100			96		
CM capacity (veh/h)	180	230	418	210	197	601	851			997		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	60	109	439	621								
Volume Left	44	38	0	44								
Volume Right	16	71	27	0								
cSH	213	364	1700	997								
Volumes to Capacity	0.28	0.30	0.26	0.04								
Queue Length 95th (m)	8.5	9.4	0.0	1.1								
Control Delay (s)	28.5	19.0	0.0	1.2								
Lane LOS	D	C	A	A								
Approach Delay (s)	28.5	19.0	0.0	1.2								
Approach LOS	D	C	C	C								
Intersection Summary												
Average Delay	3.7											
Intersection Capacity Utilization	72.7%											
ICU Level of Service	C											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
19: Parliament Street & Cole Street

03-22-2023

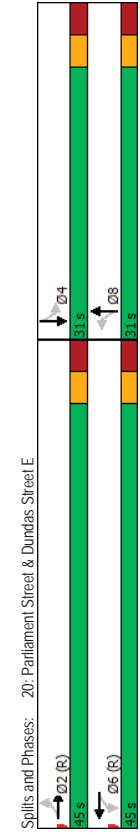
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	405	20	25	495
Future Volume (Veh/h)	0	0	405	20	25	495
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	440	22	27	538
Pedestrians	260		10			15
Lane Width (m)	0.0		3.5			3.5
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	0		1			1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.94	0.94			0.94	
VC, conflicting volume	1034	496			712	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	905	332			562	
IC, single (s)	6.8	6.9			4.2	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
CM capacity (veh/h)	253	620			931	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volumes Total	293	169	206	359		
Volume Left	0	0	27	0		
Volume Right	0	22	0	0		
cSH	1700	1700	931	1700		
Volumes to Capacity	0.17	0.10	0.03	0.21		
Queue Length 95th (m)	0.0	0.0	0.7	0.0		
Control Delay (s)	0.0	0.0	1.4	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0	0.0	0.5	0.0		
Approach LOS	A	A	A	A		
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	45.0%					
ICU Level of Service	A					
Analysis Period (min)	15					



Timings 20: Parliament Street & Dundas Street E 2032 Future Background AM Model (FutRN) 03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	30	305	35	335	40	310	65	390
Traffic Volume (vph)	30	305	35	335	40	310	65	390
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	2	6	6	8	8	8	4	4
Protected Phases	2	2	6	6	8	8	4	4
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Initial (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Minimum Split (s)	45.0	45.0	45.0	45.0	31.0	31.0	31.0	31.0
Total Split (s)	59.2%	59.2%	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Total Split (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Lead/Lag	C-Min	C-Min	C-Min	C-Min	Min	Min
Lead-Lag Optimize?	41.3	41.3	24.7	24.7	24.7	24.7
Recall Mode	0.54	0.54	0.32	0.32	0.32	0.32
Act Effct Green (s)	0.25	0.31	0.45	0.58	0.58	0.58
Actuated g/C Ratio	9.5	12.4	21.7	23.7	23.7	23.7
v/c Ratio	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	9.5	12.4	21.7	23.7	23.7	23.7
Total Delay	A	B	C	C	C	C
LOS	A	B	C	C	C	C
Approach Delay	A	B	C	C	C	C
Approach LOS	A	B	C	C	C	C



Queues 20: Parliament Street & Dundas Street E 2032 Future Background AM Model (FutRN) 03-22-2023

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	383	483	389	527
v/c Ratio	0.25	0.31	0.45	0.58
Control Delay	9.5	12.4	21.7	23.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.5	12.4	21.7	23.7
Queue Length 50th (m)	13.1	26.0	22.8	32.3
Queue Length 95th (m)	22.8	35.5	32.4	44.1
Internal Link Dist (m)	85.0	103.5	45.0	56.1
Turn Bay Length (m)	1561	1556	922	963
Base Capacity (vph)	0	0	0	0
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	0.25	0.31	0.42	0.55

Intersection Summary				
EBT	WBT	NBT	SBT	
→	←	↑	↓	

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 20: Parliament Street & Dundas Street E

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	305	25	35	335	85	40	310	15	65	390	40
Future Volume (vph)	30	305	25	35	335	85	40	310	15	65	390	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. 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
Frbp. ped/bikes	0.99	0.99	0.99	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. ped/bikes	0.99	0.99	0.99	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FIL Protected	3171	3090	3112	3112	3090	3112	3112	3090	3112	3090	3112	3090
Sat'd. Flow (prot)	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
FIL Permitted	2840	2798	2798	2798	2798	2798	2798	2798	2798	2798	2798	2798
Sat'd. Flow (perm)	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	324	27	37	356	90	43	330	16	69	415	43
RTOR Reduction (vph)	0	7	0	0	25	0	4	0	0	0	9	0
Lane Group Flow (vph)	0	376	0	0	458	0	0	385	0	0	518	0
Conf. Peds. (#/hr)	155	110	110	110	155	140	155	140	160	160	140	140
Conf. Bikes (#/hr)	10	10	10	10	10	25	10	10	10	10	10	10
Heavy Vehicles (%)	6%	10%	4%	22%	5%	13%	18%	11%	13%	2%	5%	5%
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2	2	2	6	6	6	8	8	8	8	8	4
Permitted Phases	2	2	2	6	6	6	8	8	8	8	8	4
Actuated Green, G (s)	40.3	40.3	40.3	41.3	41.3	41.3	23.7	23.7	23.7	23.7	23.7	23.7
Effective Green, g (s)	41.3	41.3	41.3	41.3	41.3	41.3	24.7	24.7	24.7	24.7	24.7	24.7
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.32	0.32	0.32	0.32	0.32	0.32
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1543	1520	1520	1520	1520	1520	861	861	861	861	861	861
V/S Ratio Prot	0.13	0.13	0.13	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.19
V/S Ratio Perm	0.24	0.24	0.24	0.30	0.30	0.30	0.45	0.45	0.45	0.45	0.45	0.58
Uniform Delay, d1	9.1	9.1	9.1	9.5	9.5	9.5	20.3	20.3	20.3	20.3	20.3	21.3
Progression Factor	1.00	1.00	1.00	1.37	1.37	1.37	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.9
Delay (s)	9.5	9.5	9.5	13.5	13.5	13.5	20.6	20.6	20.6	20.6	20.6	22.2
Level of Service	A	A	A	B	B	B	C	C	C	C	C	C
Approach Delay (s)	9.5	9.5	9.5	13.5	13.5	13.5	20.6	20.6	20.6	20.6	20.6	22.2
Approach LOS	A	A	A	B	B	B	C	C	C	C	C	C
Intersection Summary												
HCM 2000 Control Delay	16.8 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.40											
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 10.0											
Intersection Capacity Utilization	91.7% ICU Level of Service F											
Analysis Period (min)	15											
c Critical Lane Group												

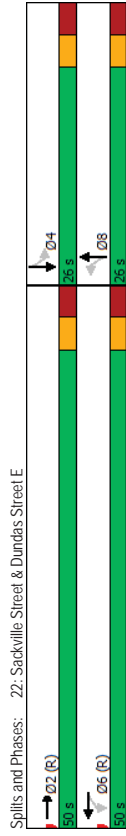
HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 21: Regent Street & Dundas Street E

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	380	10	10	430	35	15	10	5	20	10	20
Future Volume (Veh/h)	10	380	10	10	430	35	15	10	5	20	10	20
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	413	11	11	467	38	16	11	5	22	11	22
Pedestrians	20	20	20	20	20	20	20	20	20	20	20	20
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2	2	2	2	2	2	2	2	2	2	2	2
Right turn flare (veh)	None	None	None	None	None	None	None	None	None	None	None	None
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)	127	127	127	127	127	127	127	127	127	127	127	127
Upstream signal (m)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
pX, platoon unblocked	585	585	585	494	494	494	814	1118	287	832	1104	352
vC, conflicting volume	585	585	585	494	494	494	814	1118	287	832	1104	352
VC1, stage 1 conf vol	585	585	585	494	494	494	814	1118	284	829	1102	352
VC2, stage 2 conf vol	4.1	4.1	4.1	4.1	4.1	4.1	7.6	6.7	6.9	7.6	6.5	7.1
IC, unblocked vol	2.2	2.2	2.2	2.2	2.2	2.2	3.6	4.1	3.3	3.5	4.0	3.4
IF (s)	99	99	99	99	99	99	92	93	99	89	94	96
p0 queue free %	929	929	929	1015	1015	1015	197	164	671	199	182	567
dM capacity (veh/h)	929	929	929	1015	1015	1015	197	164	671	199	182	567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 1	SB 1	SB 1	SB 1	SB 1	SB 1	SB 1
Volumes Total	218	218	244	272	32	32	55	55	55	55	55	55
Volume Left	11	0	11	0	16	22	22	22	22	22	22	22
Volume Right	0	11	0	38	5	22	22	22	22	22	22	22
cSH	929	1700	1015	1700	205	262	262	262	262	262	262	262
Volumes to Capacity	0.01	0.13	0.01	0.16	0.16	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Queue Length 95th (m)	0.3	0.0	0.2	0.0	0.0	4.1	5.9	5.9	5.9	5.9	5.9	5.9
Control Delay (s)	0.6	0.0	0.5	0.0	0.0	25.7	22.3	22.3	22.3	22.3	22.3	22.3
Lane LOS	A	A	A	A	D	C	C	C	C	C	C	C
Approach Delay (s)	0.3	0.2	0.2	25.7	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
Approach LOS	D	D	D	D	D	D	D	D	D	D	D	D
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	35.9% ICU Level of Service A											
Analysis Period (min)	15											

Timings 2032 Future Background AM Model (FutRN) 03-22-2023  
 22: Sackville Street & Dundas Street E

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↑↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	415	10	395	45	0	75	50
Future Volume (vph)	415	10	395	45	0	75	50
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	6	6	8	8	4	4
Permitted Phases	2	6	6	8	8	4	4
Detector Phase							
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	47.5	47.5	47.5	18.5	18.5	18.5	18.5
Actuated g/C Ratio	0.62	0.62	0.62	0.24	0.24	0.24	0.24
v/c Ratio	0.23	0.40	0.40	0.22	0.51	0.51	0.51
Control Delay	6.8	6.2	6.2	12.8	26.3	26.3	26.3
Queue Delay	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Total Delay	6.8	6.5	6.5	12.8	26.3	26.3	26.3
LOS	A	A	A	B	B	C	C
Approach Delay	6.8	6.5	6.5	12.8	26.3	26.3	26.3
Approach LOS	A	A	A	B	B	C	C
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: T1 (14%), Referenced to phase 2EBT and 6WBTL, Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/c Ratio: 0.51							
Intersection Signal Delay: 10.1							
Intersection Capacity Utilization 53.2%							
Analysis Period (min) 15							



Queues 2032 Future Background AM Model (FutRN) 03-22-2023  
 22: Sackville Street & Dundas Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	463	427	73	174
v/c Ratio	0.23	0.40	0.22	0.51
Control Delay	6.8	6.2	12.8	26.3
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	6.8	6.5	12.8	26.3
Queue Length 50th (m)	9.3	30.1	3.2	17.9
Queue Length 95th (m)	31.0	12.6	12.5	35.3
Internal Link Dist (m)	99.8	79.6	36.2	126.8
Turn Bay Length (m)				
Base Capacity (vph)	2019	1072	373	385
Starvation Cap Reductn	0	220	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.50	0.20	0.45
Intersection Summary				

2032 Future Background AM Model (FutRN)  
 03-22-2023  
 HCM Signalized Intersection Capacity Analysis  
 22: Sackville Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Traffic Volume (vph)	0	415	25	10	395	0	45	0	25	75	50	40
Future Volume (vph)	0	415	25	10	395	0	45	0	25	75	50	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor	0.95				1.00			1.00			1.00	
Frbp. ped/bikes	0.99				1.00			0.95			0.98	
Frbp. ped/bikes	1.00				1.00			0.97			0.95	
Frt	0.99				1.00			0.95			0.97	
Flt Protected	1.00				1.00			0.97			0.98	
Sat'd. Flow (prot)	3230				1736			1553			1591	
Flt Permitted	1.00				0.99			0.77			0.82	
Sat'd. Flow (perm)	3230				1716			1234			1338	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	437	26	11	416	0	47	0	26	79	53	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	33	0	0	16	0
Lane Group Flow (vph)	0	463	0	0	427	0	0	40	0	0	158	0
Confl. Peds. (#/hr)	65		85	85		65	65		60	60		65
Confl. Bikes (#/hr)		10			25							
Heavy Vehicles (%)	0%	8%	13%	0%	8%	0%	0%	0%	8%	6%	2%	4%
Turn Type	MA	MA	NA	NA	MA	NA	NA	MA	MA	MA	MA	MA
Protected Phases	2				6			8			4	
Permitted Phases		6			6		8		4		4	
Actuated Green, G (s)	46.5				46.5		17.5		17.5		17.5	
Effective Green, g (s)	47.5				47.5		18.5		18.5		18.5	
Actuated g/C Ratio	0.62				0.62		0.24		0.24		0.24	
Clearance Time (s)	6.0				6.0		6.0		6.0		6.0	
Vehicle Extension (s)	3.0				3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	2018				1072		300		300		325	
v/s Ratio Prot	0.14				0.25		0.03		0.03		0.12	
v/s Ratio Perm	0.23				0.40		0.13		0.13		0.49	
v/c Ratio	0.23				0.40		0.13		0.13		0.49	
Uniform Delay, d1	6.2				7.1		22.5		24.7		24.7	
Progression Factor	0.94				0.62		1.00		1.00		1.00	
Incremental Delay, d2	0.3				1.1		0.2		0.2		1.1	
Delay (s)	6.1				5.5		22.7		25.8		25.8	
Level of Service	A				A		C		C		C	
Approach Delay (s)	6.1				5.5		22.7		25.8		25.8	
Approach LOS	A				A		C		C		C	
Intersection Summary												
HCM 2000 Control Delay	10.0 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	76.0 Sum of lost time (s)											
Intersection Capacity Utilization	53.2% ICU Level of Service A											
Analysis Period (min)	15											
c Critical Lane Group												

2032 Future Background AM Model (FutRN)  
 03-22-2023  
 Timings  
 23: Regent Park Boulevard & Dundas Street E

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	4			4
Traffic Volume (vph)	495	15	405	
Future Volume (vph)	495	15	405	
Turn Type	NA	Perm	NA	
Protected Phases	2		6	4
Permitted Phases		6		
Detector Phase	2	6	6	
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.9		4.9	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8		64.8	
Actuated g/C Ratio	0.85		0.85	
v/c Ratio	0.37		0.30	
Control Delay	4.2		4.6	
Queue Delay	0.0		0.0	
Total Delay	4.2		4.6	
LOS	A		A	
Approach Delay	4.2		4.6	
Approach LOS	A		A	
Intersection Summary				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 8 (11%) Referenced to phase 2:EBT and 6:WBL, Start of 1st Green				
Natural Cycle: 55				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.37				
Intersection Signal Delay: 4.4				
Intersection Capacity Utilization 52.9%				
ICU Level of Service A				
Analysis Period (min) 15				
Spills and Phases: 23: Regent Park Boulevard & Dundas Street E				

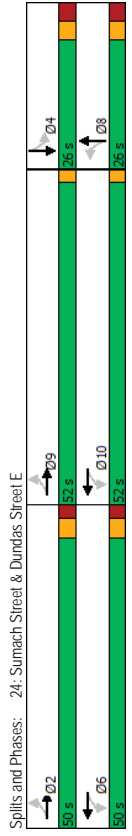
	EBT	WBT
Lane Group	537	438
Lane Group Flow (vph)	0.37	0.30
v/c Ratio	4.2	4.6
Control Delay	0.0	0.0
Queue Delay	4.2	4.6
Total Delay	9.2	0.0
Queue Length 50th (m)	28.5	43.8
Queue Length 95th (m)	79.6	86.0
Internal Link Dist (m)	1465	1447
Turn Bay Length (m)	32	116
Base Capacity (vph)	0	0
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0.37	0.33
Reduced v/c Ratio		
Intersection Summary		

	EBT	EBR	WBL	WBT	NBL	NBR
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	495	20	15	405	0	0
Traffic Volume (vph)	495	20	15	405	0	0
Future Volume (vph)	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	3.5	3.0	3.0	3.5	3.0	3.0
Lane Width	4.9	4.9	4.9	4.9	4.9	4.9
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1717	1717	1717	1717	1717	1717
Satd. Flow (prot)	1.00	0.98	0.98	1.00	0.98	0.98
Flt Permitted	1777	1777	1777	1777	1777	1777
Satd. Flow (perm)	0.96	0.96	0.96	0.96	0.96	0.96
Peak-hour factor, PHF	516	21	16	422	0	0
Adj. Flow (vph)	1	0	0	0	0	0
RTOR Reduction (vph)	536	0	0	438	0	0
Lane Group Flow (vph)	125	125	125	40	60	60
Conf. Peds. (#/hr)	8%	0%	9%	8%	0%	0%
Heavy Vehicles (%)	NA	NA	NA	NA	NA	NA
Turn Type	2	6	6	6	6	6
Protected Phases	59.1	60.1	60.1	59.1	60.1	60.1
Permitted Phases	0.79	5.9	5.9	0.79	5.9	5.9
Actuated Green, G (s)	3.0	3.0	3.0	3.0	3.0	3.0
Effective Green, g (s)	1357	1357	1357	1357	1357	1357
Actuated g/C Ratio	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31
Clearance Time (s)	0.39	0.33	0.26	0.39	0.33	0.26
Vehicle Extension (s)	2.4	2.2	2.2	2.4	2.2	2.2
Lane Grp Cap (vph)	0.82	1.00	1.00	0.82	1.00	1.00
v/s Ratio Prot	0.8	0.7	0.7	0.8	0.7	0.7
v/s Ratio Perm	2.8	2.9	2.9	2.8	2.9	2.9
W/C Ratio	A	A	A	A	A	A
Uniform Delay, d1	2.8	2.9	2.9	2.8	2.9	2.9
Progression Factor	2.8	2.9	2.9	2.8	2.9	2.9
Incremental Delay, d2	2.8	2.9	2.9	2.8	2.9	2.9
Delay (s)	2.8	2.9	2.9	2.8	2.9	2.9
Level of Service	A	A	A	A	A	A
Approach Delay (s)	2.8	2.9	2.9	2.8	2.9	2.9
Approach LOS	A	A	A	A	A	A
Intersection Summary						
HCM 2000 Control Delay	2.9	2.9	2.9	2.9	2.9	2.9
HCM 2000 Volume to Capacity ratio	0.35	0.35	0.35	0.35	0.35	0.35
Actuated Cycle Length (s)	76.0	76.0	76.0	76.0	76.0	76.0
Intersection Capacity Utilization	52.9%	52.9%	52.9%	52.9%	52.9%	52.9%
Analysis Period (min)	15	15	15	15	15	15
c. Critical Lane Group						

Timings 2032 Future Background AM Model (FutRN) 03-22-2023  
 24: Sumach Street & Dundas Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Configurations	15	435	30	395	15	30	40	40					
Traffic Volume (vph)	15	435	30	395	15	30	40	0					
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	NA					
Turn Type	2.9		6.10		8		4		2	6	9	10	
Protected Phases	2	2	6	6	8	8	4	4					
Detector Phase													
Switch Phase													
Minimum Initial (s)					20.0	20.0	20.0	20.0	16.0	16.0	5.0	5.0	
Minimum Split (s)					26.0	26.0	26.0	26.0	21.0	21.0	52.0	52.0	
Total Split (s)					26.0	26.0	26.0	26.0	50.0	50.0	52.0	52.0	
Total Split (%)					20.3%	20.3%	20.3%	20.3%	39%	39%	41%	41%	
Yellow Time (s)					3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	
All-Red Time (s)					3.0	3.0	3.0	3.0	2.0	2.0	0.0	0.0	
Lost Time Adjust (s)					-1.0	-1.0	-1.0	-1.0					
Total Lost Time (s)					5.0	5.0	5.0	5.0					
Lead/Lag													
Lead-Lag Optimize?					None	None	None	None	Min	Min	None	None	
Recall Mode													
Act Effct Green (s)		71.8		71.8		25.4		25.4					
Actuated g/C Ratio		0.78		0.78		0.27		0.27					
v/c Ratio		0.43		0.42		0.28		0.17					
Control Delay		6.9		6.8		28.1		20.5					
Queue Delay		1.4		0.3		0.0		0.0					
Total Delay		8.4		7.1		28.1		20.5					
LOS		A		A		C		C					
Approach Delay		8.4		7.1		28.1		20.5					
Approach LOS		A		A		C		C					

Intersection Summary
Cycle Length: 128
Actuated Cycle Length: 92.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 10.1
Intersection Capacity Utilization 61.6%
Analysis Period (min) 15



Queues 2032 Future Background AM Model (FutRN) 03-22-2023  
 24: Sumach Street & Dundas Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	538	511	109	54
v/c Ratio	0.43	0.42	0.28	0.17
Control Delay	6.9	6.8	28.1	20.5
Queue Delay	1.4	0.3	0.0	0.0
Total Delay	8.4	7.1	28.1	20.5
Queue Length 50th (m)	39.9	37.2	11.7	3.3
Queue Length 95th (m)	58.2	54.7	29.8	15.0
Internal Link Dist (m)	86.0	75.5	76.2	121.5
Turn Bay Length (m)				
Base Capacity (vph)	1248	1218	390	309
Starvation Cap Reductn	495	246	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.53	0.28	0.17

Intersection Summary



HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 24: Sumach Street & Dundas Street E

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	435	45	30	395	45	15	30	55	40	0	10
Future Volume (vph)	15	435	45	30	395	45	15	30	55	40	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.0			4.0			5.0				5.0	
Lane Util. Factor	1.00			1.00			1.00				1.00	
Frbp. ped/bikes	0.96			0.98			0.93				0.94	
Frbp. ped/bikes	1.00			0.99			0.96				0.93	
Frt	0.99			0.99			0.93				0.97	
Flt Protected	1.00			1.00			0.99				0.96	
Sat'd. Flow (prot)	1650			1662			1423				1501	
Flt Permitted	0.98			0.95			0.95				0.69	
Sat'd. Flow (perm)	1624			1584			1364				1083	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	473	49	33	429	49	16	33	60	43	0	11
RTOR Reduction (vph)	0	3	0	0	3	0	0	35	0	0	29	0
Lane Group Flow (vph)	0	535	0	0	508	0	0	74	0	0	25	0
Conf. Bikes (#/hr)	70	135	135	70	120	120	50	50	50	50	120	120
Heavy Vehicles (%)	13%	7%	14%	9%	8%	3%	11%	3%	10%	0%	3%	10%
Turn Type	Perm	MA	Perm	NA	Perm	NA	Perm	NA	Perm	MA	Perm	MA
Protected Phases		2.9		6.10		8		8		4		4
Permitted Phases		2.9		6.10		8		8		4		4
Actuated Green, G (s)		72.2		72.2		73.2		14.9		13.9		13.9
Effective Green, g (s)		73.2		73.2		73.2		14.9		14.9		14.9
Actuated g/C Ratio		0.78		0.78		0.78		0.16		0.16		0.16
Clearance Time (s)								6.0		6.0		6.0
Vehicle Extension (s)								3.0		3.0		3.0
Lane Grp Cap (vph)		1263		1232		215		215		171		171
v/s Ratio Prot												
v/s Ratio Perm		60.33		0.32		60.05		60.05		0.02		0.02
v/c Ratio		0.42		0.41		0.35		0.35		0.15		0.15
Uniform Delay, d1		3.5		3.4		35.3		35.3		34.1		34.1
Progression Factor		1.00		1.00		1.00		1.00		1.00		1.00
Incremental Delay, d2		0.2		0.2		1.0		1.0		0.4		0.4
Delay (s)		3.7		3.6		36.2		36.2		34.5		34.5
Level of Service		A		A		D		D		C		C
Approach Delay (s)		3.7		3.6		36.2		36.2		34.5		34.5
Approach LOS		A		A		D		D		C		C
Intersection Summary												
HCM 2000 Control Delay		8.0		HCM 2000 Level of Service		A						
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		94.1		Sum of lost time (s)		10.0						
Intersection Capacity Utilization		61.6%		ICU Level of Service		B						
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 25: Tubman Avenue & Dundas Street E

03-22-2023

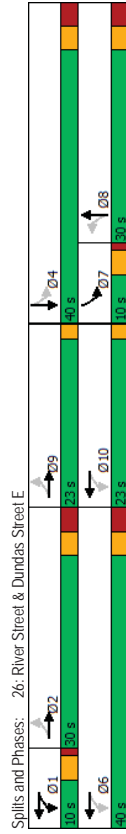
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	515	15	5	470	0	0	0	0	5	0	0
Future Volume (Veh/h)	0	515	15	5	470	0	0	0	0	5	0	0
Sign Control		Free		Free			Stop		Stop			Stop
Grade		0%		0%			0%		0%			0%
Peak Hour Factor		0.90		0.90		0.90	0.90		0.90		0.90	0.90
Hourly flow rate (vph)		0	572	17	6	522	0	0	0	6	0	0
Pedestrians		5		5			115		115		45	45
Lane Width (m)		3.5		3.5			0.0		0.0		3.5	3.5
Walking Speed (m/s)		1.1		1.1			1.1		1.1		1.1	1.1
Percent Blockage		0		0			0		0		4	4
Right turn flare (veh)												
Median type		None		None			None		None			
Median storage (veh)												
Upstream signal (m)		99		98			98		98		98	98
pX, platoon unblocked		0.84		0.91			0.89		0.89		0.89	0.89
vC, conflicting volume		567		704			1234		1274		700	1164
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol		391		627			976		1021		623	897
IC, single (s)		4.1		4.1			7.1		6.5		6.2	6.5
IC, 2 stage (s)												
IF (s)		2.2		2.2			3.5		4.0		3.3	4.0
p0 queue free %		100		99			100		100		97	100
dM capacity (veh/h)		952		879			198		201		444	198
Direction, Lane #		EB 1	WB 1	SB 1								
Volumes Total		589	528	6			6		6		6	6
Volume Left		0	6	6			0		0		0	0
Volume Right		17	0	0			0		0		0	0
ESH		952	879	215			198		201		444	198
Volumes to Capacity		0.00	0.01	0.03			0.00		0.00		0.03	0.03
Queue Length 95th (m)		0.0	0.2	0.7			0.0		0.2		0.7	0.7
Control Delay (s)		0.0	0.2	22.3			0.0		0.2		22.3	22.3
Lane LOS		A		C			A		C		C	C
Approach Delay (s)		0.0	0.2	22.3			0.0		0.2		22.3	22.3
Approach LOS		C		C			C		C		C	C
Intersection Summary												
Average Delay							0.2		41.0%		ICU Level of Service	A
Intersection Capacity Utilization							41.0%					
Analysis Period (min)							15					

Timings 2032 Future Background AM Model (FutRN) 03-22-2023

Queues 2032 Future Background AM Model (FutRN) 03-22-2023

26: River Street & Dundas Street E

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT					
Lane Configurations	15	455	110	315	70	325	110	410					
Traffic Volume (vph)	15	455	110	315	70	325	110	410					
Future Volume (vph)	Perm	NA	custom	NA	Perm	NA	prh+pt	NA					
Turn Type	2	9	1	1	6	10	8	4	2	6	9	10	
Protected Phases	2	9	1	1	6	10	8	4					
Permitted Phases	2	9	1	1	6	10	8	4					
Detector Phase	2	9	1	1	6	10	8	4					
Switch Phase	2	9	1	1	6	10	8	4					
Minimum Initial (s)	6.0	21.0	21.0	21.0	5.0	21.0	21.0	21.0	5.0	21.0	5.0	5.0	
Minimum Split (s)	10.0	27.0	27.0	27.0	9.0	27.0	27.0	27.0	23.0	27.0	23.0	23.0	
Total Split (s)	10.0	30.0	30.0	30.0	10.0	40.0	30.0	40.0	23.0	30.0	23.0	23.0	
Total Split (%)	9.7%	29.1%	29.1%	29.1%	9.7%	38.8%	29%	39%	22%	29%	22%	22%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	
All-Red Time (s)	1.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0					
Total Lost Time (s)	5.0	5.0	5.0	5.0	3.0	5.0	5.0	5.0					
Lead/Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	Min	Min	Min	None	Min	Min	Min					
Act Effct Green (s)	28.6	40.7	25.3	25.3	37.4	35.4	35.4	35.4					
Actuated g/C Ratio	0.34	0.48	0.30	0.30	0.44	0.42	0.42	0.42					
v/c Ratio	0.97	0.82	0.45	0.45	0.53	0.79	0.79	0.79					
Control Delay	59.0	29.2	37.7	37.7	67.1	27.0	32.8	32.8					
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	59.0	29.2	37.7	37.7	67.1	27.0	32.8	32.8					
LOS	E	C	D	E	C	C	C	C					
Approach Delay	59.0	29.2	37.7	37.7	67.1	27.0	32.8	32.8					
Approach LOS	E	C	E	E	C	C	C	C					
Intersection Summary													
Cycle Length	103												
Actuated Cycle Length	84.2												
Natural Cycle	100												
Control Type	Actuated-Uncoordinated												
Maximum v/c Ratio	0.98												
Intersection Signal Delay	45.7												
Intersection Capacity Utilization	115.8%												
Analysis Period (min)	15												



	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	553	505	74	490	117	532
v/c Ratio	0.97	0.82	0.45	0.98	0.53	0.79
Control Delay	59.0	29.2	37.7	67.1	27.0	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	29.2	37.7	67.1	27.0	32.8
Queue Length 50th (m)	-92.7	54.5	8.9	69.6	9.9	64.2
Queue Length 95th (m)	124.9	80.7	#31.6	#179.1	#31.4	#169.2
Internal Link Dist (m)	73.4	80.5		131.0		118.9
Turn Bay Length (m)			20.0		25.0	
Base Capacity (vph)	578	619	164	499	220	674
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.82	0.45	0.98	0.53	0.79
Intersection Summary						
-	Volume exceeds capacity, queue is theoretically infinite.					
-	Queue shown is maximum after two cycles.					
#	95th percentile volume exceeds capacity, queue may be longer.					
-	Queue shown is maximum after two cycles.					

HCM Signalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 26: River Street & Dundas Street E

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4		4	4		4				
Traffic Volume (vph)	15	455	50	110	315	50	70	325	135	110	410	90
Future Volume (vph)	15	455	50	110	315	50	70	325	135	110	410	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0	5.0	3.0	3.0	5.0	5.0	5.0	5.0	3.0	3.0	5.0	5.0
Lane Util. Factor	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.98	0.99	0.99	0.99	0.99	0.99	0.95	1.00	1.00	1.00	0.97	1.00
Frbp. ped/bikes	1.00	0.99	0.99	0.99	0.99	1.00	0.96	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.99	0.99	0.99	0.99	1.00	0.95	1.00	0.95	1.00	0.97	1.00
Flt Protected	1.00	0.99	0.99	0.99	0.99	1.00	0.95	1.00	0.95	1.00	0.97	1.00
Satd. Flow (prot)	1702	1705	1705	1705	1705	1630	1630	1601	1601	1597	1597	1597
Flt Permitted	0.98	0.98	0.68	0.68	0.35	1.00	0.14	1.00	0.14	1.00	0.14	1.00
Satd. Flow (perm)	1671	1166	1166	1166	546	1630	238	1597	238	1597	238	1597
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	484	53	117	335	53	74	346	144	117	436	96
RTOR Reduction (vph)	0	4	0	0	5	0	0	13	0	0	7	0
Lane Group Flow (vph)	0	549	0	0	500	0	74	477	0	117	525	0
Conf. Bikes (#/hr)	65	90	90	90	65	65	65	45	45	45	65	65
Heavy Vehicles (%)	0%	7%	4%	3%	7%	0%	9%	9%	1%	5%	12%	7%
Turn Type	Perm	MA	MA	custom	NA	Perm	NA	NA	pm+pl	MA	MA	MA
Protected Phases	2.9	1	1	6.10	1	6.10	8	8	7	4	4	4
Permitted Phases	2.9	6.10	6.10	8	8	8	8	8	4	4	4	4
Actuated Green, G (s)	33.3	43.4	43.4	24.3	24.3	24.3	24.3	24.3	34.4	34.4	34.4	34.4
Effective Green, g (s)	34.3	39.4	39.4	25.3	25.3	25.3	25.3	25.3	35.4	35.4	35.4	35.4
Actuated g/C Ratio	0.40	0.46	0.46	0.29	0.29	0.29	0.29	0.29	0.41	0.41	0.41	0.41
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0	4.0	4.0	6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	668	580	580	161	480	161	480	210	658	210	658	658
v/s Ratio Prot				c0.07	c0.07	c0.29	c0.29	c0.29	0.05	c0.33	c0.33	c0.33
v/s Ratio Perm	c0.33	c0.32	c0.32	0.14	0.14	0.14	0.18	0.18	0.18	0.18	0.18	0.18
v/c Ratio	0.82	0.86	0.86	0.46	0.46	0.46	0.56	0.56	0.80	0.80	0.80	0.80
Uniform Delay, d1	23.0	20.8	20.8	24.7	30.2	24.7	30.2	18.8	22.1	18.8	22.1	22.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	12.5	12.5	2.1	39.0	2.1	39.0	3.2	6.7	3.2	6.7	6.7
Delay (s)	31.0	33.2	33.2	26.7	69.2	26.7	69.2	22.0	28.8	22.0	28.8	28.8
Level of Service	C	C	C	C	E	C	E	C	C	C	C	C
Approach Delay (s)	31.0	33.2	33.2	63.6	63.6	63.6	63.6	27.5	27.5	27.5	27.5	27.5
Approach LOS	C	C	C	E	E	E	E	C	C	C	C	C
Intersection Summary												
HCM 2000 Control Delay	38.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.95											
Actuated Cycle Length (s)	85.8 Sum of lost time (s)											
Intersection Capacity Utilization	115.8% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 27: Dreamer's Way & Gerrard Street E

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4	4		4	4	
Traffic Volume (veh/h)	340	25	5	780	0	0
Future Volume (Veh/h)	340	25	5	780	0	0
Sign Control	Free	Free	Stop	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	378	28	6	867	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	88			164		
pX platoon unblocked	0.98			0.90		0.98
vC, conflicting volume	406			838		203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	344			488		136
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)						
IF (s)	2.2			3.5		3.3
p0 queue free %	99			100		100
dM capacity (veh/h)	1198			462		873
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volumes Total	252	154	295	578		
Volume Left	0	0	6	0		
Volume Right	0	28	0	0		
cSH	1700	1700	1198	1700		
Volumes to Capacity	0.15	0.09	0.01	0.34		
Queue Length 95th (m)	0.0	0.0	0.1	0.0		
Control Delay (s)	0.0	0.0	0.2	0.0		
Lane LOS			A			
Approach Delay (s)	0.0		0.1			
Approach LOS			A			
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	28.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 29: Sumach Street & Site Driveway

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	80	5	0	0
Future Volume (Veh/h)	0	0	80	5	0	0
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	89	6	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)				None		
Median type				None		
Median storage (veh)					57	
Upstream signal (m)						
pX platoon unblocked					95	
VC, conflicting volume	92	92				
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	92	92			95	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
CM capacity (veh/h)	913	971			1512	
Direction, Lane #	WB 1	NB 1				
Volumes Total	0	95				
Volume Left	0	0				
Volume Right	0	6				
cSH	1700	1700				
Volumes to Capacity	0.00	0.06				
Queue Length 95th (m)	0.0	0.0				
Control Delay (s)	0.0	0.0				
Lane LOS	A	A				
Approach Delay (s)	0.0	0.0				
Approach LOS	A	A				
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			7.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 31: Street 'G' & Gerrard Street E

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	350	0	0	845	0	5
Future Volume (Veh/h)	350	0	0	845	0	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	389	0	0	939	0	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)				None		
Median type				None		
Median storage (veh)						
Upstream signal (m)				80		
pX platoon unblocked						
VC, conflicting volume	389	389			858	194
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	389	389			513	194
IC, single (s)	4.1	4.1			6.8	6.9
IC, 2 stage (s)						
IF (s)	2.2	2.2			3.5	3.3
p0 queue free %	100	100			100	99
CM capacity (veh/h)	1181	1181			427	820
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volumes Total	194	194	470	470	6	6
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	6	6
cSH	1700	1700	1700	1700	820	820
Volumes to Capacity	0.11	0.11	0.28	0.28	0.01	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	0.0	0.0	9.4	9.4
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.0	0.0	0.0	0.0	9.4	9.4
Approach LOS	A	A	A	A	A	A
Intersection Summary						
Average Delay					0.0	
Intersection Capacity Utilization			26.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background AM Model (FutRN)  
 32: Oak Street & Street 'G'

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	50	35	0	0	0
Future Volume (Veh/h)	5	50	35	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	56	39	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None				
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					107	39
VC conflicting volume	39					
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	39				107	39
IC single (s)	4.1				6.4	6.2
IC 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
CM capacity (veh/h)	1584				892	1038
Direction Lane #	EB 1	WB 1				
Volumes Total	62	39				
Volume Left	6	0				
Volume Right	0	0				
cSH	1584	1700				
Volumes to Capacity	0.00	0.02				
Queue Length 95th (m)	0.1	0.0				
Control Delay (s)	0.7	0.0				
Lane LOS	A					
Approach Delay (s)	0.7	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			10.1%			ICU Level of Service A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 1: Parliament Street & Gerrard Street E (North Section)

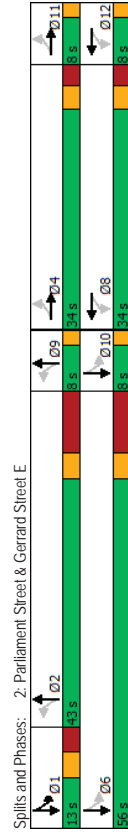
03-22-2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	10	515	585	75
Future Volume (Veh/h)	0	0	10	515	585	75
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	11	579	657	84
Pedestrians	150				5	10
Lane Width (m)	0.0				3.5	3.5
Walking Speed (m/s)	1.1				1.1	1.1
Percent Blockage	0				0	1
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)					39	
pX platoon unblocked						
VC conflicting volume	1170	526	891			
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	1066	526	891			
IC single (s)	6.8	6.9	4.3			
IC 2 stage (s)						
IF (s)	3.5	3.3	2.3			
p0 queue free %	100	100	98			
CM capacity (veh/h)	204	500	702			
Direction Lane #	NB 1	NB 2	SB 1	SB 2		
Volumes Total	204	386	438	303		
Volume Left	11	0	0	0		
Volume Right	0	0	0	84		
cSH	702	1700	1700	1700		
Volumes to Capacity	0.02	0.23	0.26	0.18		
Queue Length 95th (m)	0.4	0.0	0.0	0.0		
Control Delay (s)	0.7	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	0.2		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			32.9%			ICU Level of Service A
Analysis Period (min)			15			

Timings  
2: Parliament Street & Gerrard Street E

2032 Future Background PM Model (FutRN)  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø4	Ø6	Ø8
Lane Configurations												
Traffic Volume (vph)	30	540	45	250	75	360	230	285	41%	285		
Future Volume (vph)	30	540	45	250	75	360	230	285				
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA				
Protected Phases	4 11		8 12		2 9		1 16 10		2	4	6	8
Permitted Phases	4	4	8	8	2	2	1	1 6				
Detector Phase												
Switch Phase												
Minimum Initial (s)					6.0				22.0	21.0	22.0	21.0
Minimum Split (s)					12.5				33.2	31.8	33.2	31.8
Total Split (s)					13.0				43.0	34.0	56.0	34.0
Total Split (%)					12.3%				41%	32%	53%	32%
Yellow Time (s)					3.3				3.3	3.0	3.3	3.0
All-Red Time (s)					3.2				7.9	2.8	7.9	2.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead/Lag Optimize?					Yes				Lag			
Recall Mode					None				Yes	Min	Min	Min
Act Effct Green (s)	31.4		31.4		28.9				53.1			
Actuated g/C Ratio	0.33		0.33		0.30				0.56			
v/c Ratio	0.64		0.50		0.77				0.51			
Control Delay	30.0		23.4		37.3				13.4			
Queue Delay	0.0		0.0		0.0				0.0			
Total Delay	30.0		23.4		37.3				13.4			
LOS	C		C		D				B			
Approach Delay	30.0		23.4		37.3				13.4			
Approach LOS	C		C		D				B			
Intersection Summary												
Cycle Length: 106												
Actuated Cycle Length: 95												
Natural Cycle: 95												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 26.1												
Intersection Capacity Utilization: 100.2%												
Analysis Period (min): 15												



Timings  
2: Parliament Street & Gerrard Street E

2032 Future Background PM Model (FutRN)  
03-22-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type				
Protected Phases	9	10	11	12
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	8.0	8.0	8.0	8.0
Total Split (s)	8.0	8.0	8.0	8.0
Total Split (%)	8%	8%	8%	8%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead/Lag Optimize?				
Recall Mode	None	None	None	None
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				



Queues 2032 Future Background PM Model (FutRN)  
 2: Parliament Street & Gerrard Street E

03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	665	443	567	603
Lane Group Flow (vph)	0.64	0.50	0.77	0.51
v/c Ratio	30.0	23.4	37.3	13.4
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	30.0	23.4	37.3	13.4
Total Delay	54.9	28.9	50.5	30.9
Queue Length 50th (m)	76.3	45.1	73.1	43.6
Queue Length 95th (m)	33.0	65.6	119.2	15.0
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1097	902	848	1234
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.49	0.67	0.49
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 2: Parliament Street & Gerrard Street E

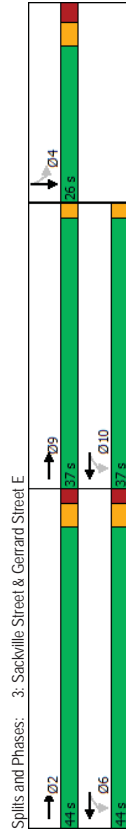
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB			4TB			4TB				4TB
Traffic Volume (vph)	30	540	75	45	250	135	75	360	115	230	285	70
Future Volume (vph)	30	540	75	45	250	135	75	360	115	230	285	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		4.8			4.8			10.2				5.5
Lane Util. Factor		0.95			0.95			0.95				0.95
Frpb, ped/bikes		0.98			0.95			0.93				0.99
Flpb, ped/bikes		1.00			1.00			0.99				0.97
Flt		0.98			0.95			0.97				0.98
Flt Protected		1.00			0.99			0.99				0.98
Sat'd Flow (prot)		3390			3105			3109				3172
Flt Permitted		0.91			0.81			0.75				0.60
Sat'd Flow (perm)		3108			2522			2353				1946
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	31	557	77	46	258	139	77	371	119	237	294	72
RTOR Reduction (vph)	0	9	0	0	48	0	0	18	0	0	11	0
Lane Group Flow (vph)	0	656	0	0	395	0	0	549	0	0	592	0
Confl. Peds. (#/hr)	130	120	120	130	125	125	235	235	125	235	235	125
Confl. Bikes (#/hr)			25			10			15			5
Heavy Vehicles (%)	10%	0%	5%	0%	0%	10%	4%	2%	2%	6%	4%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	custom	NA	NA
Protected Phases	4 11		8 12		8 12		2 9		2 9	1	6 10	
Permitted Phases										6 10		
Actuated Green, G (s)		35.1			35.1			43.8			56.9	
Effective Green, g (s)		36.1			36.1			44.8			47.7	
Actuated g/C Ratio		0.38			0.38			0.47			0.50	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		1168			948			1098			1063	
v/s Ratio Prot		c0.21			0.16			c0.23			c0.23	
v/c Ratio Perm		0.56			0.42			0.50			0.56	
v/c Ratio		23.7			22.2			17.8			16.8	
Uniform Delay, d1		1.00			1.00			1.00			1.00	
Progression Factor		0.6			0.3			0.4			0.6	
Incremental Delay, d2		24.3			22.5			18.2			17.4	
Delay (s)		C			C			B			B	
Level of Service		C			C			B			B	
Approach Delay (s)		24.3			22.5			18.2			17.4	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	20.6 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	96.0 Sum of lost time (s) 22.5											
Intersection Capacity Utilization	100.2% ICU Level of Service G											
Analysis Period (min)	15											
c Critical Lane Group												

Timings 2032 Future Background PM Model (FutRN) 03-22-2023

3. Sackville Street & Gerrard Street E

Lane Group	EBT	WBL	WBT	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	↑↑		↑↑	↔				
Traffic Volume (vph)	930	50	540	40				
Future Volume (vph)	930	50	540	40				
Turn Type	NA	Perm	NA	NA				
Protected Phases	2.9		6.10	4	2	6	9	10
Permitted Phases	6.10							
Detector Phase								
Switch Phase	2	6	6	4				
Minimum Initial (s)				20.0	16.0	16.0	5.0	5.0
Minimum Split (s)				25.7	21.0	21.0	37.0	37.0
Total Split (s)				26.0	44.0	44.0	37.0	37.0
Total Split (%)				24.3%	41%	41%	35%	35%
Yellow Time (s)				3.0	3.0	3.0	2.0	2.0
All-Red Time (s)				2.7	2.0	2.0	0.0	0.0
Lost Time Adjust (s)				-1.0				
Total Lost Time (s)				4.7				
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode				Min	Min	Min	None	None
Act Effct Green (s)	37.3		37.3	21.6				
Actuated g/C Ratio	0.55		0.55	0.32				
v/c Ratio	0.53		0.41	0.40				
Control Delay	10.1		9.1	23.6				
Queue Delay	0.0		0.0	0.0				
Total Delay	10.1		9.1	23.6				
LOS	B		A	C				
Approach Delay	10.1		9.1	23.6				
Approach LOS	B		A	C				
<b>Intersection Summary</b>								
Cycle Length:	107							
Actuated Cycle Length:	67.8							
Natural Cycle:	85							
Control Type:	Actuated-Uncoordinated							
Maximum v/c Ratio:	0.53							
Intersection Signal Delay:	11.3							
Intersection Capacity Utilization:	72.1%							
Analysis Period (min):	15							



Queues 2032 Future Background PM Model (FutRN) 03-22-2023

3. Sackville Street & Gerrard Street E

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	995	615	209
v/c Ratio	0.53	0.41	0.40
Control Delay	10.1	9.1	23.6
Queue Delay	0.0	0.0	0.0
Total Delay	10.1	9.1	23.6
Queue Length 50th (m)	36.6	20.8	21.2
Queue Length 95th (m)	49.0	29.7	44.9
Internal Link Dist (m)	56.5	47.8	15.3
Turn Bay Length (m)			
Base Capacity (vph)	2208	1772	529
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.35	0.40
<b>Intersection Summary</b>			

3. Sackville Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4↑	4↑								4↓	4↓
Traffic Volume (vph)	0	930	25	50	540	0	0	0	0	135	40	25
Future Volume (vph)	0	930	25	50	540	0	0	0	0	135	40	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		4.0	4.0								4.7	
Lane Util. 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
Frbp. ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	3437	3437	3437	3437	3437	3437	3437	3437	3437	3437	3437	3437
FIL Permitted	1.00	0.82	0.82	1.00	0.82	0.82	1.00	0.82	0.82	1.00	0.82	0.82
Satd. Flow (perm)	3437	2760	2760	3437	2760	2760	3437	2760	2760	3437	2760	2760
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	969	26	52	562	0	0	0	0	141	42	26
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	993	0	0	615	0	0	0	0	0	205	0
Conf. Bikes (#/hr)	85	70	70	85	90	85	90	60	60	60	90	90
Heavy Vehicles (%)	0%	3%	0%	0%	6%	0%	0%	0%	0%	1%	0%	0%
Turn Type	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA
Protected Phases	2.9	6.10	6.10	2.9	6.10	6.10	2.9	6.10	6.10	2.9	6.10	6.10
Permitted Phases		6.10	39.8							4		
Actuated Green, G (s)	39.8	40.8	40.8	39.8	40.8	40.8	39.8	40.8	40.8	39.8	40.8	40.8
Effective Green, g (s)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	2059	1653	1653	2059	1653	1653	2059	1653	1653	2059	1653	1653
v/s Ratio Prot	c0.29											
v/s Ratio Perm	0.48	0.22	0.37	0.48	0.22	0.37	0.48	0.22	0.37	0.48	0.22	0.37
v/c Ratio	7.7	7.0	7.0	7.7	7.0	7.0	7.7	7.0	7.0	7.7	7.0	7.0
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1
Incremental Delay, d2	7.9	7.2	7.2	7.9	7.2	7.2	7.9	7.2	7.2	7.9	7.2	7.2
Delay (s)	A	A	A	A	A	A	A	A	A	A	A	A
Level of Service	B	B	B	B	B	B	B	B	B	B	B	B
Approach Delay (s)	7.9	7.2	7.2	7.9	7.2	7.2	7.9	7.2	7.2	7.9	7.2	7.2
Approach LOS	A	A	A	A	A	A	A	A	A	A	A	A
Intersection Summary												
HCM 2000 Control Delay	8.9 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.47											
Actuated Cycle Length (s)	68.1 Sum of lost time (s) 9.7											
Intersection Capacity Utilization	72.1% ICU Level of Service C											
Analysis Period (min)	15											
c Critical Lane Group												

4. Gerrard Street E & Gifford Street  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	4↑		W	W
Traffic Volume (veh/h)	10	1055	585	5	15	5
Future Volume (Veh/h)	10	1055	585	5	15	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	1241	688	6	18	6
Pedestrians		5			65	
Lane Width (m)		3.5			3.0	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			5	
Right turn flare (veh)		None			None	
Median type		None			None	
Median storage (veh)						
Upstream signal (m)		72	141			
pX platoon unblocked	0.97			0.86	0.97	
vC, conflicting volume	759			1400	417	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	684			960	331	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
IF (s)	2.2			3.5	3.3	
p0 queue free %	99			91	99	
dM capacity (veh/h)	845			207	614	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	426	827	459	235	24	
Volume Left	12	0	0	0	18	
Volume Right	0	0	0	6	6	
ESH	845	1700	1700	1700	248	
Volumes to Capacity	0.01	0.49	0.27	0.14	0.10	
Queue Length 95th (m)	0.3	0.0	0.0	0.0	2.4	
Control Delay (s)	0.4	0.0	0.0	0.0	21.1	
Lane LOS	A	A	A	C	C	
Approach Delay (s)	0.1	0.0	0.0	21.1		
Approach LOS				C		
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	41.7%					
ICU Level of Service	A					
Analysis Period (min)	15					

5. Gerrard Street E & Nasmith Avenue

6. Summach Street & Gerrard Street E

03-22-2023

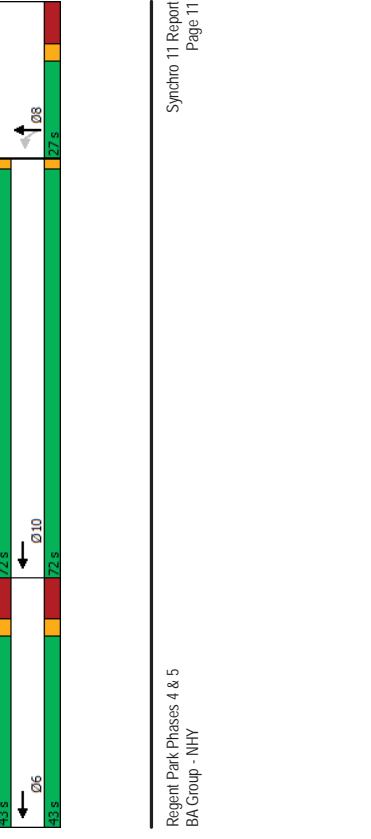
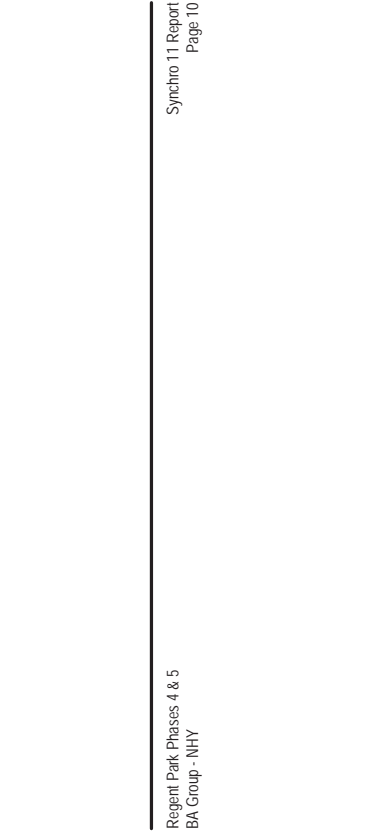
03-22-2023

2032 Future Background PM Model (FutRN)

2032 Future Background PM Model (FutRN)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4A	4A	4B	4B	W	W
Traffic Volume (veh/h)	5	1065	585	5	5	5
Future Volume (Veh/h)	5	1065	585	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	1224	672	6	6	6
Pedestrians					60	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					5	
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)	0.94	145	68		0.88	0.94
pX platoon unblocked	738				1359	399
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	601				844	241
IC, single (s)	4.1				6.8	6.9
IC, 2 stage (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
CM capacity (veh/h)	888				256	689
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volume Total	414	816	448	230	12	12
Volume Left	6	0	0	0	6	6
Volume Right	0	0	0	0	6	6
cSH	888	1700	1700	1700	373	
Volumes to Capacity	0.01	0.48	0.26	0.14	0.03	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.8	
Control Delay (s)	0.2	0.0	0.0	0.0	15.0	
Lane LOS	A				B	
Approach Delay (s)	0.1		0.0		15.0	
Approach LOS					B	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	42.9%					
Analysis Period (min)	15					
ICU Level of Service	A					

Lane Group	EBL	EBT	WBT	WBR	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	4A	4A	4B	4B	4B				
Traffic Volume (vph)	10	1060	565	25					
Future Volume (vph)	10	1060	565	25					
Turn Type	Perm	NA	NA	NA	NA				
Protected Phases	2.9	2.9	6.10	8	2	6	9	10	
Permitted Phases	2.9	2.9	6.10	8					
Detector Phase									
Switch Phase									
Minimum Initial (s)					15.0	11.0	5.0	5.0	
Minimum Split (s)					25.4	26.2	72.0	72.0	
Total Split (s)					27.0	43.0	72.0	72.0	
Total Split (%)					19.0%	30%	30%	51%	
Yellow Time (s)					3.0	3.0	2.0	2.0	
All-Red Time (s)					7.4	7.2	7.2	0.0	
Lost Time Adjust (s)					-1.0				
Total Lost Time (s)					9.4				
Lead-Lag									
Lead-Lag Optimize?									
Recall Mode					None	Min	None	None	
Act Effct Green (s)		58.1	58.1	16.4					
Actuated g/C Ratio		0.62	0.62	0.18					
v/C Ratio		0.54	0.34	0.47					
Control Delay		10.9	8.3	29.2					
Queue Delay		0.0	0.0	0.0					
Total Delay		10.9	8.3	29.2					
LOS		B	A	C					
Approach Delay		10.9	8.3	29.2					
Approach LOS		B	A	C					
Intersection Summary									
Cycle Length	142								
Actuated Cycle Length	93.3								
Natural Cycle	725								
Control Type	Actuated-Uncoordinated								
Maximum v/C Ratio	0.54								
Intersection Signal Delay	11.4								
Intersection Capacity Utilization	68.7%								
Analysis Period (min)	15								



Queues 2032 Future Background PM Model (FutRN) 03-22-2023  
 6: Summach Street & Gerrard Street E

	EBT	WBT	NBT
Lane Group	1103	670	145
Lane Group Flow (vph)	0.54	0.34	0.47
v/c Ratio	10.9	8.3	29.2
Control Delay	0.0	0.0	0.0
Queue Delay	10.9	8.3	29.2
Total Delay	52.5	25.3	15.8
Queue Length 50th (m)	70.4	35.9	35.5
Queue Length 95th (m)	44.0	75.7	30.7
Internal Link Dist (m)			
Turn Bay Length (m)	3242	3028	329
Base Capacity (vph)	245	0	0
Station Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.37	0.22	0.44
<b>Intersection Summary</b>			

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN) 03-22-2023  
 6: Summach Street & Gerrard Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4			4			4			
Traffic Volume (vph)	10	1060	0	0	565	85	25	25	90	0	0
Future Volume (vph)	10	1060	0	0	565	85	25	25	90	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5
Total Lost time (s)		9.2			9.2			9.4			
Lane Util. Factor		0.95			0.95			1.00			
Frbp. ped/bikes		1.00			0.96			0.95			
Frbp. ped/bikes		1.00			1.00			0.97			
Frt		1.00			0.98			0.91			
Flt Protected		3495			3247			1569			
Sat'd. Flow (prot)		0.95			1.00			0.99			
Flt Permitted		3312			3247			1569			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	1093	0	0	582	88	26	26	93	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	43	0	0	0
Lane Group Flow (vph)	0	1103	0	0	661	0	0	102	0	0	0
Confl. Peds. (#/hr)	95	95	95	95	95	80	35	35	35	35	80
Confl. Bikes (#/hr)		75			35			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	Perm	NA	NA	NA	NA	NA
Protected Phases	2.9				6.10			8			
Permitted Phases	2.9				6.10			8			
Actuated Green, G (s)	65.3				65.3			15.4			
Effective Green, g (s)	66.3				66.3			16.4			
Actuated g/C Ratio	0.71				0.71			0.18			
Clearance Time (s)								10.4			
Vehicle Extension (s)								3.0			
Lane Grp Cap (vph)	2358				2312			276			
v/s Ratio Prot					0.20						
v/s Ratio Perm	0.33				0.29			0.07			
v/c Ratio	0.47				0.29			0.37			
Uniform Delay, d1	5.8				4.8			33.8			
Progression Factor	1.00				1.00			1.00			
Incremental Delay, d2	0.1				0.1			0.8			
Delay (s)	5.9				4.9			34.6			
Level of Service	A				A			C			
Approach Delay (s)	5.9				4.9			34.6			0.0
Approach LOS	A				A			C			A
<b>Intersection Summary</b>											
HCM 2000 Control Delay	7.7 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.49										
Actuated Cycle Length (s)	93.1										
Intersection Capacity Utilization	68.7%										
Analysis Period (min)	15										
c Critical Lane Group											

7. Street J/Sword Street & Gerrard Street E

03-22-2023

2032 Future Background PM Model (FutRN)

HCAM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB
Traffic Volume (veh/h)	0	1140	10	0	640	0	0	0	0	15	0	10
Future Volume (Veh/h)	0	1140	10	0	640	0	0	0	0	15	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1267	11	0	711	0	0	0	0	17	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None											
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked	0.93			0.87			0.90	0.90	0.87	0.90	0.90	0.93
VC, conflicting volume	776			1278			1639	2048	639	1410	2054	420
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
IC, unblocked vol	621			1009			1157	1613	271	902	1620	241
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.1
IC, 2 stage (s)												
p0 queue free %	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free (s)	100			100			100	100	100	91	100	98
CM capacity (veh/h)	862			601			131	90	634	194	89	660
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1							
Volume Total	845	433	237	474	28							
Volume Left	0	0	0	0	17							
Volume Right	0	11	0	0	11							
cSH	1700	1700	601	1700	268							
Volumes to Capacity	0.50	0.25	0.00	0.28	0.10							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.6							
Control Delay (s)	0.0	0.0	0.0	0.0	20.0							
Lane LOS					C							
Approach Delay (s)	0.0	0.0	0.0	20.0								
Approach LOS				C								
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	41.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

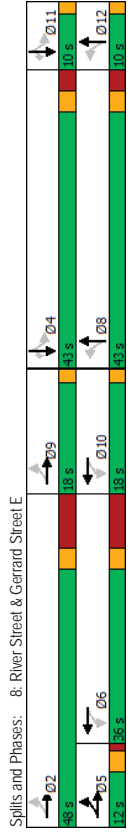
8. River Street & Gerrard Street E

03-22-2023

2032 Future Background PM Model (FutRN)

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	225	855	85	380	70	340	165	450	190			
Future Volume (vph)	225	855	85	380	70	340	165	450	190			
Turn Type	custom	NA	Perm	NA	Perm	NA	Perm	NA	Perm	2	4	6
Protected Phases	5	5 2 9	6 10	8 12	8 12	4 11	4 11	4 11	4 11			
Detector Phase	5	5 2	6	6	8	8	4	4	4			
Switch Phase												
Minimum Initial (s)	6.0									23.0	19.0	23.0
Minimum Split (s)	10.0									33.8	30.0	33.8
Total Split (s)	12.0									48.0	43.0	36.0
Total Split (%)	10.1%									40%	36%	30%
Yellow Time (s)	3.0									3.0	3.0	3.0
All-Red Time (s)	1.0									7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None											
Act Effct Green (s)	55.6				36.5	39.0	39.0	39.0	39.0	39.0	39.0	
Actuated g/C Ratio	0.54				0.36	0.38	0.38	0.38	0.38	0.38	0.38	
v/c Ratio	0.90				0.92	0.36	0.77	1.00	0.67	0.30		
Control Delay	30.4				51.8	31.3	36.8	104.7	33.0	4.6		
Queue Delay	18.5				0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	48.9				51.8	31.3	36.8	104.7	33.0	4.6		
LOS	D				D	C	D	F	C	C	A	
Approach Delay	48.9				51.8	36.1	41.0					
Approach LOS	D				D	D	D					
Intersection Summary												
Cycle Length	119											
Actuated Cycle Length	102.7											
Natural Cycle	105											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	1.00											
Intersection Signal Delay	45.0											
Intersection Capacity Utilization	116.5%											
Analysis Period (min)	15											





Timings 2032 Future Background PM Model (FutRN) 03-22-2023  
8: River Street & Gerrard Street E

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Split (s)	30.0	18.0	18.0	10.0	10.0
Total Split (s)	43.0	18.0	18.0	10.0	10.0
Total Split (%)	36%	15%	15%	8%	8%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues 2032 Future Background PM Model (FutRN) 03-22-2023  
8: River Street & Gerrard Street E

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1203	594	73	521	172	469	198
v/c Ratio	0.90	0.92	0.36	0.77	1.00	0.67	0.30
Control Delay	30.4	51.8	31.3	36.8	104.7	33.0	4.6
Queue Delay	18.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	51.8	31.3	36.8	104.7	33.0	4.6
Queue Length 50th (m)	82.2	55.7	11.6	96.9	-41.0	86.1	0.0
Queue Length 95th (m)	#142.2	#99.8	24.8	138.5	#82.6	121.3	14.0
Internal Link Dist (m)	67.0	81.6	30.0	126.5	61.7		
Turn Bay Length (m)			30.0				
Base Capacity (vph)	1334	644	211	697	178	730	678
Starvation Cap Reductn	163	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.92	0.35	0.75	0.97	0.64	0.29
Intersection Summary							
-	Volume exceeds capacity, queue is theoretically infinite.						
-	Queue shown is maximum after two cycles.						
#	95th percentile volume exceeds capacity, queue may be longer.						
-	Queue shown is maximum after two cycles.						

8: River Street & Gerrard Street E

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	855	75	85	380	105	70	340	160	165	450	190
Future Volume (vph)	225	855	75	85	380	105	70	340	160	165	450	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.5	3.0
Total Lost time (s)	3.0	9.8	3.0	9.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. 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
Frbp. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt Protected	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Sat'd. Flow (prot)	3380	3271	1625	1742	1643	1860	1424					
FIL Permitted	0.67	0.54										
Sat'd. Flow (perm)	2278	1770	536	1742	456	1860	1424					
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	891	78	89	396	109	73	354	167	172	469	198
RTOR Reduction (vph)	0	5	0	0	15	0	0	14	0	0	0	114
Lane Group Flow (vph)	0	1198	0	0	579	0	73	507	0	172	469	84
Conf. Bikes (#/hr)	40	80	80	40	15	40	40	15	40	40	15	10
Heavy Vehicles (%)	3%	2%	3%	0%	4%	0%	3%	0%	1%	1%	1%	2%
Turn Type	custom	MA	Perm	NA	Perm	NA	Perm	NA	Perm	MA	Perm	MA
Protected Phases	5	5.29	6.10	6.10	8.12	8.12	4.11					
Permitted Phases	2.9	57.4	45.3	44.6	43.6	43.6	43.6	43.6	43.6	43.6	43.6	43.6
Effective Green, G (s)	48.6	46.3	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Actuated g/C Ratio	0.46	0.44	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1149	780	227	739	193	790	604					
v/s Ratio Prot	c0.09			0.29			0.25					
v/s Ratio Perm	c0.39			0.14			0.38					
v/c Ratio	1.04	0.74	0.32	0.69	0.89	0.59	0.14					
Uniform Delay, d1	28.2	24.4	20.1	24.5	28.0	23.2	18.5					
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2	38.4	3.8	0.8	2.7	36.2	1.2	0.1					
Delay (s)	66.6	28.2	20.9	27.2	64.1	24.4	18.6					
Level of Service	E	C	C	C	E	C	C					
Approach Delay (s)	66.6	28.2	26.4		31.2							
Approach LOS	E	C	C		C							
Intersection Summary												
HCM 2000 Control Delay	43.0 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	1.02											
Actuated Cycle Length (s)	106.0 Sum of lost time (s)											
Intersection Capacity Utilization	116.5% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

9: Sackville Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	10	10	0	0	0	0	0	5	110	0
Future Volume (Veh/h)	0	0	10	10	0	0	0	0	0	5	110	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	12	12	0	0	0	0	0	6	129	0
Pedestrians	60	35	35	35	35	5	5	5	5	15	15	15
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	0.0	0.0	0.0	0.0	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	5	3	3	3	3	0	0	0	0	1	1	1
Right turn flare (veh)												
Median type	None											
Median storage (veh)												
Upstream signal (m)												
pk. platoon unblocked												
v/c, conflicting volume	216	236	194	193	236	50	189			35		
vc1, stage 1 conf vol												
vc2, stage 2 conf vol												
vcu, unblocked vol	216	236	194	193	236	50	189			35		
ic, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
ic, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
pd queue free %	100	100	99	98	100	100	100			100		
pd capacity (veh/h)	650	611	807	688	611	979	1323			1540		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	12	12	135									
Volume Left	0	12	6									
Volume Right	12	0	0									
cSH	807	688	1540									
Volumes to Capacity	0.01	0.02	0.00									
Queue Length 95th (m)	0.3	0.4	0.1									
Control Delay (s)	9.5	10.3	0.4									
Lane LOS	A	B	A									
Approach Delay (s)	9.5	10.3	0.4									
Approach LOS	A	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	29.2%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 10: Parliament Street & Oak Street

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (veh/h)	35	55	495	25	25	380
Future Volume (Veh/h)	35	55	495	25	25	380
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	41	65	582	29	29	447
Pedestrians	200	5	5	5	55	55
Lane Width (m)	3.0	3.5	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	17	0	0	0	5	5
Right turn flare (veh)						
Median type		None			None	
Median storage (veh)						
Upstream signal (m)			151		143	
PX platoon unblocked	0.93	0.93			0.93	
VC conflicting volume	1103	580			831	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCU unblocked vol	962	401			670	
IC single (s)	6.8	6.9			4.3	
IC 2 stage (s)						
IF (s)	3.5	3.3			2.3	
p0 queue free %	78	85			96	
pM capacity (veh/h)	190	446			661	
Direction_Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	106	388	223	178	298	
Volume Left	41	0	0	29	0	
Volume Right	65	0	29	0	0	
cSH	293	1700	1700	661	1700	
Volumes to Capacity	0.36	0.23	0.13	0.04	0.18	
Queue Length 95th (m)	12.1	0.0	0.0	1.0	0.0	
Control Delay (s)	24.1	0.0	0.0	2.2	0.0	
Lane LOS	C	A	A	A	A	
Approach Delay (s)	24.1	0.0	0.0	0.8		
Approach LOS	C			A		
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	48.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 11: Oak Street & Dreamers Way

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		T	T	T	T	T
Traffic Volume (veh/h)	0	55	40	0	15	45
Future Volume (Veh/h)	0	55	40	0	15	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	59	43	0	16	48
Pedestrians	25	10	10	40	40	40
Lane Width (m)	3.5	3.5	3.0	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2	1	1	3	3	3
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
PX platoon unblocked					152	108
VC conflicting volume	83					
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCU unblocked vol	83				152	108
IC single (s)	4.1				6.4	6.2
IC 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	100				98	95
pM capacity (veh/h)	1481				872	902
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	59	43	64			
Volume Left	0	0	16			
Volume Right	0	0	48			
cSH	1700	1700	878			
Volumes to Capacity	0.03	0.03	0.07			
Queue Length 95th (m)	0.0	0.0	1.8			
Control Delay (s)	0.0	0.0	9.4			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.4			
Approach LOS	A		A			
Intersection Summary						
Average Delay	3.6					
Intersection Capacity Utilization	27.2%					
ICU Level of Service	A					
Analysis Period (min)	15					

12: Regent Street & Oak Street  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑				↑	↑
Traffic Volume (veh/h)	70	0	0	25	15	45
Future Volume (Veh/h)	70	0	0	25	15	45
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	84	0	0	30	18	54
Pedestrians	15			15	40	
Lane Width (m)	3.5			3.5	3.0	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume		124		169	139	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol		124		169	139	
IC, single (s)		4.1		6.4	6.2	
IC, 2 stage (s)		2.2		3.5	3.3	
p0 queue free %		100		98	94	
CM capacity (veh/h)		1431		790	875	
Direction_Lane #	EB 1	WB 1	NB 1			
Volume Total	84	30	72			
Volume Left	0	0	18			
Volume Right	0	0	54			
cSH	1700	1700	852			
Volume to Capacity	0.05	0.02	0.08			
Queue Length 95th (m)	0.0	0.0	2.1			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			27.2%		ICU Level of Service	A
Analysis Period (min)			15			

14: Sackville Street & Oak Street  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop		Stop	Stop			Stop			Stop	
Traffic Volume (vph)	0	85	20	0	5	0	0	0	0	0	35	85
Future Volume (vph)	0	85	20	0	5	0	0	0	0	0	35	85
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	94	22	0	6	0	0	0	0	0	39	94
Direction_Lane #	EB 1	WB 1	SB 1									
Volume Total (vph)	116	6	139									
Volume Left (vph)	0	0	39									
Volume Right (vph)	22	0	6									
Head (s)	-0.09	0.00	0.10									
Departure Headway (s)	4.1	4.3	4.3									
Degree Utilization, x	0.13	0.01	0.16									
Capacity (veh/h)	840	785	816									
Control Delay (s)	7.8	7.4	8.1									
Approach Delay (s)	7.8	7.4	8.1									
Approach LOS	A	A	A									
Intersection Summary												
Delay			7.9									
Level of Service			A									
Intersection Capacity Utilization			32.7%									A
Analysis Period (min)			15									

15: Sumach Street & Oak Street

16: Tubman Avenue/Street 'J' & Oak Street

03-22-2023

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	45	60	15	0	0	0	5	80	75	0	0	0
Future Volume (vph)	45	60	15	0	0	0	5	80	75	0	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	49	66	16	0	0	0	5	88	82	0	0	0
Direction, Lane #	EB 1	NB 1										
Volume Total (vph)	131	175										
Volume Left (vph)	49	5										
Volume Right (vph)	16	82										
HadJ (s)	0.07	-0.20										
Departure Headway (s)	4.3	4.0										
Degree Utilization, x	0.16	0.19										
Capacity (veh/h)	797	868										
Control Delay (s)	8.2	8.0										
Approach Delay (s)	8.2	8.0										
Approach LOS	A	A										
Intersection Summary												
Delay	8.0											
Level of Service	A											
Intersection Capacity Utilization	34.6%											
ICU Level of Service	A											
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	125	10	0	0	0	0	0	0	0	5	5
Future Volume (Veh/h)	0	125	10	0	0	0	0	0	0	0	5	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	0	134	11	0	0	0	0	0	0	0	5	5
Pedestrians	20			5			30					
Lane Width (m)	3.5			0.0			0.0					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	2			0			0					
Right turn flare (veh)												
Median type	None			None			None					
Median storage (veh)												
Upstream signal (m)												
Upstream unblocked												
VC, platooning unblocked												
VC, conflicting volume	0		175				192		170		144	175
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	0		175				192		170		144	175
IC, single (s)	4.1		4.1				7.1		6.5		7.1	6.5
IC, 2 stage (s)												
IF (s)	2.2		2.2				3.5		4.0		3.5	4.0
p0 queue free %	100		100				100		100		99	99
dm capacity (veh/h)	1636		1414				754		727		874	722
1045												
Direction, Lane #	EB 1	SB 1										
Volume Total	145	10										
Volume Left	0	5										
Volume Right	11	0										
cSH	1700	772										
Volume to Capacity	0.09	0.01										
Queue Length 95th (m)	0.0	0.3										
Control Delay (s)	0.0	9.7										
Lane LOS	A	A										
Approach Delay (s)	0.0	9.7										
Approach LOS	A	A										
Intersection Summary												
Average Delay	0.6											
Intersection Capacity Utilization	26.7%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
17: Oak Street & Site Driveway

03-22-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4			1	
Traffic Volume (veh/h)	5	125	0	0	10	0
Future Volume (Veh/h)	5	125	0	0	10	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	6	142	0	0	11	0
Pedestrians	5	5	5	5	25	5
Lane Width (m)	3.5	0.0	3.0	3.0	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	0	0	2	2
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					184	30
VC, conflicting volume	25					
VC1, stage 1 conf vol						
VCu, unblocked vol	25				184	30
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
CM capacity (veh/h)	1572				792	1026
Direction, Lane #	EB 1	SB 1				
Volumes Total	148	11				
Volume Left	6	11				
Volume Right	0	0				
cSH	1572	792				
Volumes to Capacity	0.00	0.01				
Queue Length 95th (m)	0.1	0.3				
Control Delay (s)	0.3	9.6				
Lane LOS	A	A				
Approach Delay (s)	0.3	9.6				
Approach LOS	A	A				
Intersection Summary						
Average Delay		1.0				
Intersection Capacity Utilization		22.2%			ICU Level of Service	A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
18: River Street & Oak Street

03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations		4	4		4			1			4
Traffic Volume (veh/h)	85	5	45	20	0	50	0	435	40	50	560
Future Volume (Veh/h)	85	5	45	20	0	50	0	435	40	50	560
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	5	49	22	0	54	0	473	43	54	609
Pedestrians	75	75	45	45	45	50	50	3.5	3.5	3.5	5
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	7	7	4	4	4	4	4	4	4	4	0
Right turn flare (veh)											
Median type	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)											
Upstream signal (m)								143			151
pX platoon unblocked	0.85	0.85	0.80	0.85	0.85	0.90	0.80			0.90	
VC, conflicting volume	1346	1353	734	1358	1332	544	684			561	
VC1, stage 1 conf vol											
VC2, stage 2 conf vol											
VCu, unblocked vol	1060	1069	541	1075	1044	442	478			460	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1	
IC, 2 stage (s)											
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2	
p0 queue free %	28	97	87	81	100	90	100			94	
CM capacity (veh/h)	127	160	382	116	166	535	816			964	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1							
Volumes Total	146	76	516	663							
Volume Left	92	22	0	54							
Volume Right	49	54	43	0							
cSH	165	262	1700	964							
Volumes to Capacity	0.88	0.29	0.30	0.06							
Queue Length 95th (m)	47.8	8.9	0.0	1.4							
Control Delay (s)	97.1	24.3	0.0	1.4							
Lane LOS	F	C	A	A							
Approach Delay (s)	97.1	24.3	0.0	1.4							
Approach LOS	F	C	A	A							
Intersection Summary											
Average Delay			12.1								
Intersection Capacity Utilization			83.6%			ICU Level of Service					E
Analysis Period (min)			15								



19: Parliament Street & Cole Street

03-22-2023

2032 Future Background PM Model (FutRN)

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	520	20	25	390
Future Volume (Veh/h)	0	0	520	20	25	390
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	619	24	30	464
Pedestrians	255	0	25	0	15	0
Lane Width (m)	0.0	3.5	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	2	0	0	0	0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.89	0.89	0.89	0.89	0.89	0.89
VC, conflicting volume	1203	592				898
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	990	306				649
IC, single (s)	6.8	6.9				4.1
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IF (s)	100	100				96
CM capacity (veh/h)	208	614				846
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	413	230	185	309		
Volume Left	0	0	30	0		
Volume Right	0	24	0	0		
cSH	1700	1700	846	1700		
Volumes to Capacity	0.24	0.14	0.04	0.18		
Queue Length 95th (m)	0.0	0.0	0.8	0.0		
Control Delay (s)	0.0	0.0	1.8	0.0		
Lane LOS			A			
Approach Delay (s)	0.0	0.7				
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			43.5%			ICU Level of Service A
Analysis Period (min)			15			

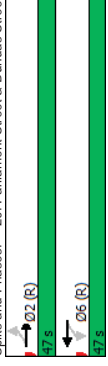
20: Parliament Street & Dundas Street E

03-22-2023

2032 Future Background PM Model (FutRN)

03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	65	490	45	190	45	405	45	320
Future Volume (vph)	65	490	45	190	45	405	45	320
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Yellow Time (s)	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	61.8%	61.8%	61.8%	61.8%	61.8%	61.8%	61.8%	61.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)								
LeadLag		5.0		5.0		5.0		5.0
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.3	41.3	41.3	41.3	41.3	41.3	41.3	41.3
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
v/c Ratio	0.45	0.45	0.26	0.26	0.59	0.59	0.51	0.51
Control Delay	11.5	12.1	12.1	23.7	22.5	22.5	22.5	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	12.1	12.1	23.7	22.5	22.5	22.5	22.5
LOS	B	B	B	C	C	C	C	C
Approach Delay	11.5	12.1	12.1	23.7	22.5	22.5	22.5	22.5
Approach LOS	B	B	B	C	C	C	C	C
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 9 (12%) Referenced to phase 2:EBTL and 6:WBTL Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.59								
Intersection Signal Delay: 17.3								
Intersection Capacity Utilization 93.3%								
Analysis Period (min) 15								



Queues 2032 Future Background PM Model (FutRN) 03-22-2023

20: Parliament Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	691	343	551	439
Lane Group Flow (vph)	0.45	0.26	0.69	0.51
v/c Ratio	11.5	12.1	23.7	22.5
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	11.5	12.1	23.7	22.5
Total Delay	27.3	9.8	34.0	26.2
Queue Length 50th (m)	43.3	27.8	45.3	36.1
Queue Length 95th (m)	85.0	103.5	45.0	56.1
Internal Link Dist (m)				
Turn Bay Length (m)	1558	1347	935	867
Base Capacity (vph)	0	0	0	0
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	0.44	0.25	0.69	0.51
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN) 03-22-2023

20: Parliament Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4TB			4TB			4TB				4TB	
Traffic Volume (vph)	65	490	60	45	190	70	45	405	40	45	320	25	
Future Volume (vph)	65	490	60	45	190	70	45	405	40	45	320	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	
Lane Util. 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	
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Frbp. psd/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Frt	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Flt Protected	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Satd. Flow (prot)	3205	3007	3272	3272	3007	3272	3272	3007	3272	3272	3007	3272	
Flt Permitted	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Satd. Flow (perm)	2802	2802	2425	2425	2802	2425	2802	2425	2802	2425	2802	2425	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
Adj. Flow (vph)	73	551	67	51	213	79	51	465	45	51	360	28	
RTOR Reduction (vph)	0	11	0	0	9	0	0	9	0	0	7	0	
Lane Group Flow (vph)	0	680	0	0	334	0	0	542	0	0	432	0	
Confl. Peds. (#/hr)	260	155	155	260	165	225	225	165	260	155	155	260	
Confl. Bikes (#/hr)	25	25	25	20	20	20	20	25	25	25	20	25	
Heavy Vehicles (%)	3%	6%	5%	5%	6%	6%	3%	5%	0%	3%	8%	10%	
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Permitted Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Actuated Green, G (s)	40.3	40.3	40.3	40.3	40.3	40.3	23.7	23.7	23.7	23.7	23.7	23.7	
Effective Green, g (s)	41.3	41.3	41.3	41.3	41.3	41.3	24.7	24.7	24.7	24.7	24.7	24.7	
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.32	0.32	0.32	0.32	0.32	0.32	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1522	1522	1317	1317	1522	1317	927	927	1522	1317	1522	927	
v/s Ratio Prot													
v/s Ratio Perm	0.24	0.14	0.14	0.14	0.14	0.14	0.19	0.19	0.16	0.16	0.16	0.16	
v/c Ratio	0.45	0.25	0.25	0.25	0.25	0.25	0.58	0.58	0.50	0.50	0.50	0.50	
Uniform Delay, d1	10.5	9.2	9.2	9.2	9.2	9.2	21.4	21.4	20.7	20.7	20.7	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.5	0.5	0.5	0.5	0.5	0.9	0.9	0.5	0.5	0.5	0.5	
Delay (s)	11.4	12.3	12.3	12.3	12.3	12.3	22.3	22.3	21.2	21.2	21.2	21.2	
Level of Service	B	B	B	B	B	B	C	C	C	C	C	C	
Approach Delay (s)	11.4	12.3	12.3	12.3	12.3	12.3	22.3	22.3	21.2	21.2	21.2	21.2	
Approach LOS	B	B	B	B	B	B	C	C	C	C	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	16.7											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.3%											ICU Level of Service	F
Analysis Period (min)	15												
c Critical Lane Group													

21: Regent Street & Dundas Street E

03-22-2023

2032 Future Background PM Model (FutRN)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	40	505	15	5	295	25	5	10	5	5	5	25
Traffic Volume (veh/h)	40	505	15	5	295	25	5	10	5	5	5	25
Future Volume (Veh/h)	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Sign Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Grade	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak Hour Factor	43	543	16	5	317	27	5	11	5	5	5	27
Hourly flow rate (vph)	30	30	30	10	10	10	125	125	125	135	135	135
Pedestrians	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Lane Width (m)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	3	3	3	1	1	1	11	11	11	12	12	12
Percent Blockage	None	None	None	None	None	None	None	None	None	None	None	None
Right turn flare (veh)	127	127	127	124	124	124	0.95	0.95	0.95	0.95	0.95	0.95
Median storage (veh)	684	684	684	990	990	990	1251	1251	414	854	1246	1246
Upstream signal (m)	479	479	479	562	562	562	884	1159	278	740	1153	337
pX platoon unblocked	4.1	4.1	4.1	4.4	4.4	4.4	7.5	6.5	7.9	7.5	6.5	6.9
VC, conflicting volume	2.2	2.2	2.2	2.4	2.4	2.4	3.5	4.0	3.8	3.5	4.0	3.3
VC1, stage 1 conf vol	96	96	96	99	99	99	97	92	99	97	96	95
VC2, stage 2 conf vol	963	963	963	773	773	773	149	140	498	192	141	570
IC, single (s)	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
IC, 2 stage (s)	314	288	164	186	21	37						
Volume Total	43	0	5	0	5	5	5	5	5	5	5	5
Volume Left	0	16	0	27	5	27						
Volume Right	963	1700	773	1700	171	339						
cSH	0.04	0.17	0.01	0.11	0.12	0.11						
Volumes to Capacity	1.1	0.0	0.1	0.0	3.1	2.8						
Queue Length 95th (m)	1.6	0.0	0.4	0.0	28.9	16.9						
Control Delay (s)	A	A	A	D	C	C						
Lane LOS	0.9	0.2	0.2	28.9	16.9	16.9						
Approach Delay (s)				D	C	C						
Approach LOS												
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	49.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

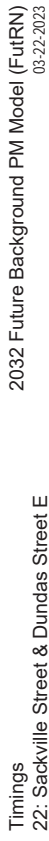


22: Sackville Street & Dundas Street E

03-22-2023

2032 Future Background PM Model (FutRN)

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	495	15	245	40	0	35	35
Traffic Volume (vph)	495	15	245	40	0	35	35
Future Volume (vph)	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	2	6	6	8	8	4	4
Protected Phases	2	6	6	6	8	8	4
Detector Phase	2	6	6	6	8	8	4
Switch Phase	17.0	17.0	17.0	17.0	7.0	7.0	7.0
Minimum Initial (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Minimum Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (s)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Total Split (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Yellow Time (s)	All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Lost Time Adjust (s)	Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lead-Lag						
Lead-Lag	Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Recall Mode	Ad Effct Green (s)	47.6	47.6	18.4	18.4	18.4	18.4
Ad Effct Green (s)	Actuated g/C Ratio	0.63	0.63	0.24	0.24	0.24	0.24
Actuated g/C Ratio	v/C Ratio	0.27	0.26	0.23	0.31	0.31	0.31
v/C Ratio	Control Delay	5.1	7.0	13.2	17.8	17.8	17.8
Control Delay	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	Total Delay	5.1	7.0	13.2	17.8	17.8	17.8
Total Delay	LOS	A	A	B	B	B	B
LOS	Approach Delay	5.1	7.0	13.2	17.8	17.8	17.8
Approach Delay	Approach LOS	A	A	B	B	B	B
Approach LOS	Intersection Summary						
Intersection Summary	Cycle Length: 76						
Cycle Length: 76	Actuated Cycle Length: 76						
Actuated Cycle Length: 76	Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green						
Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green	Natural Cycle: 50						
Natural Cycle: 50	Control Type: Actuated-Coordinated						
Control Type: Actuated-Coordinated	Maximum v/C Ratio: 0.31						
Maximum v/C Ratio: 0.31	Intersection Signal Delay: 7.7						
Intersection Signal Delay: 7.7	Intersection Capacity Utilization 49.4%						
Intersection Capacity Utilization 49.4%	Analysis Period (min) 15						
Analysis Period (min) 15	Spills and Phases: 22: Sackville Street & Dundas Street E						
Spills and Phases: 22: Sackville Street & Dundas Street E							



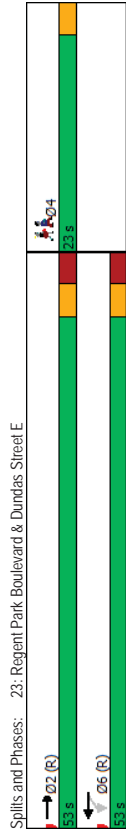
Queues 2032 Future Background PM Model (FutRN) 03-22-2023  
 22: Sackville Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	564	279	75	119
Lane Group Flow (vph)	0.27	0.26	0.23	0.31
v/c Ratio	5.1	7.0	13.2	17.8
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	5.1	7.0	13.2	17.8
Total Delay	12.7	17.6	3.4	9.0
Queue Length 50th (m)	16.5	21.8	12.9	21.6
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2059	1061	367	427
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.26	0.20	0.28
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN) 03-22-2023  
 22: Sackville Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4			4			4			4		
Traffic Volume (vph)	0	495	30	15	245	0	40	0	30	35	35	40	
Future Volume (vph)	0	495	30	15	245	0	40	0	30	35	35	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.98	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.97	0.97	0.97	
Frbp. psd/bikes	1.00	0.99	1.00	0.99	1.00	0.96	0.96	0.96	0.96	0.97	0.97	0.97	
Frt	1.00	0.99	1.00	1.00	1.00	0.94	0.94	0.94	0.94	0.95	0.95	0.95	
Flt Protected	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	0.97	0.98	0.98	0.98	
Satd. Flow (prot)	3290	1755	1755	1755	1495	1495	1495	1495	1495	1609	1609	1609	
Flt Permitted	1.00	0.96	1.00	0.96	1.00	0.79	0.79	0.79	0.79	0.89	0.89	0.89	
Satd. Flow (perm)	3290	1694	1694	1694	1220	1220	1220	1220	1220	1452	1452	1452	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	532	32	16	263	0	43	0	32	38	38	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	564	0	0	279	0	42	0	42	0	0	91	
Conf. Peds. (#/hr)	105	175	175	175	105	70	55	55	55	55	55	70	
Conf. Bikes (#/hr)	35	35	35	35	20	20	20	20	20	20	20	20	
Heavy Vehicles (%)	0%	5%	6%	0%	6%	0%	0%	0%	12%	0%	2%	5%	
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Protected Phases	2	6	6	6	6	8	8	8	8	4	4	4	
Permitted Phases													
Actuated Green, C (s)	46.6	46.6	46.6	46.6	46.6	17.4	17.4	17.4	17.4	17.4	17.4	17.4	
Effective Green, g (s)	47.6	47.6	47.6	47.6	47.6	18.4	18.4	18.4	18.4	18.4	18.4	18.4	
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.63	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	2060	1060	1060	1060	295	295	295	295	295	351	351	351	
v/s Ratio Prot	c0.17												
v/s Ratio Perm	0.27	0.16	0.26	0.16	0.26	0.14	0.14	0.14	0.14	0.26	0.26	0.26	
v/c Ratio	6.4	6.4	6.4	6.4	6.4	22.6	22.6	22.6	22.6	23.3	23.3	23.3	
Uniform Delay, d1	0.67	0.87	0.67	0.87	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Progression Factor	0.3	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.4	0.4	0.4	
Incremental Delay, d2	4.6	6.1	6.1	6.1	6.1	22.8	22.8	22.8	22.8	23.7	23.7	23.7	
Delay (s)	A	A	A	A	A	C	C	C	C	C	C	C	
Level of Service	A	A	A	A	A	C	C	C	C	C	C	C	
Approach Delay (s)	4.6	6.1	6.1	6.1	6.1	22.8	22.8	22.8	22.8	23.7	23.7	23.7	
Approach LOS	A	A	A	A	A	C	C	C	C	C	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	8.5											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.4%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	530	15	260	
Future Volume (vph)	530	15	260	
Turn Type	NA	Perm	NA	
Protected Phases	2	6	6	4
Permitted Phases		6	6	
Detector Phase	2	6	6	
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.9	4.9	4.9	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.43	0.21	0.21	
Control Delay	3.2	4.0	4.0	
Queue Delay	0.0	0.0	0.0	
Total Delay	3.3	4.0	4.0	
LOS	A	A	A	
Approach Delay	3.3	4.0	4.0	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green				
Natural Cycle: 60				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.43				
Intersection Signal Delay: 3.5				
Intersection Capacity Utilization 49.8%				
ICU Level of Service A				
Analysis Period (min) 15				



Lane Group	EBT	WBT
Lane Group Flow (vph)	630	309
v/c Ratio	0.43	0.21
Control Delay	3.2	4.0
Queue Delay	0.0	0.0
Total Delay	3.3	4.0
Queue Length 50th (m)	1.7	0.0
Queue Length 95th (m)	51.7	28.6
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1462	1448
Starvation Cap Reductn	41	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.44	0.21
<b>Intersection Summary</b>		

23: Regent Park Boulevard & Dundas Street E

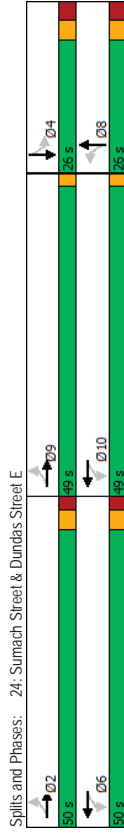
2032 Future Background PM Model (FutRN)  
03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Volume (vph)	530	30	15	260	0	0
Future Volume (vph)	530	30	15	260	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.97		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	0.99		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1712		1755			
Flt Permitted	1.00		0.96			
Sat'd Flow (perm)	1712		1695			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	596	34	17	292	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	629	0	0	309	0	0
Conf. Peds. (#/hr)	235	235	60	65		
Heavy Vehicles (%)	6%	6%	0%	6%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases			6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1353		1340			
v/s Ratio Prot	0.37					
v/s Ratio Perm	0.18		0.18			
w/s Ratio	0.46		0.23			
Uniform Delay, d1	2.6		2.0			
Progression Factor	0.50		1.00			
Incremental Delay, d2	1.1		0.4			
Delay (s)	2.4		2.4			
Level of Service	A		A			
Approach Delay (s)	2.4		2.4	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.4 HCM 2000 Level of Service A					
HCM 2000 Volume to Capacity ratio	0.41					
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 7.9					
Intersection Capacity Utilization	49.8% ICU Level of Service A					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

2032 Future Background PM Model (FutRN)  
03-22-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB
Traffic Volume (vph)	45	465	30	245	25	90	15	10
Future Volume (vph)	45	465	30	245	25	90	15	10
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2 9		6 10		8		4	
Permitted Phases	2		6		8		4	
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	16.0	16.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	21.0	21.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	50.0	50.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	40%	40%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Lost Time Adjust (s)			-1.0		-1.0			
Total Lost Time (s)			5.0		5.0			
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	62.8		62.8		22.8		22.8	
Actuated g/C Ratio	0.66		0.66		0.24		0.24	
w/s Ratio	0.54		0.37		0.47		0.10	
Control Delay	9.3		6.7		40.8		33.2	
Queue Delay	2.2		0.0		0.0		0.0	
Total Delay	11.5		6.7		40.8		33.2	
LOS	B		A		D		C	
Approach Delay	11.5		6.7		40.8		33.2	
Approach LOS	B		A		D		C	
Intersection Summary								
Cycle Length: 125								
Actuated Cycle Length: 95.4								
Natural Cycle: 100								
Control Type: Actuated-Uncoordinated								
Maximum w/s Ratio: 0.54								
Intersection Signal Delay: 15.1								
Intersection Capacity Utilization: 60.9%								
Analysis Period (min): 15								





Queues  
24: Sumach Street & Dundas Street E

2032 Future Background PM Model (FutRN)  
03-22-2023

	EBT	WBT	NBT	SBT
Lane Group	570	354	172	32
Lane Group Flow (vph)	0.54	0.37	0.47	0.10
v/c Ratio	9.3	6.7	40.8	33.2
Control Delay	2.2	0.0	0.0	0.0
Queue Delay	11.5	6.7	40.8	33.2
Total Delay	44.5	21.8	28.7	4.4
Queue Length 50th (m)	64.7	33.5	55.9	13.8
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1194	1093	364	328
Station Cap Reductn	466	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.32	0.47	0.10
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
24: Sumach Street & Dundas Street E

2032 Future Background PM Model (FutRN)  
03-22-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4	4		4	4		4			4	4	
Traffic Volume (vph)	45	465	20	30	245	55	25	90	45	15	10	5	
Future Volume (vph)	45	465	20	30	245	55	25	90	45	15	10	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Frbp. psd/bikes	0.99	0.99	0.99	0.98	0.98	0.98	0.96	0.96	0.96	0.96	0.96	0.96	
Frt	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.98	0.98	0.98	0.98	
Flt Protected	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.688	1.688	
Satd. Flow (prot)	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	
Flt Permitted	1604	1604	1604	1478	1478	1478	1519	1519	1386	1386	1386	1386	
Satd. Flow (perm)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	48	500	22	32	263	59	27	97	48	16	11	5	
RTOR Reduction (vph)	0	2	0	0	7	0	0	10	0	0	4	0	
Lane Group Flow (vph)	0	568	0	0	347	0	0	162	0	0	28	0	
Conf. Peds. (#/hr)	100	185	185	100	105	100	105	50	50	50	105	105	
Conf. Bikes (#/hr)	25	25	25	20	20	20	20	20	20	20	20	20	
Heavy Vehicles (%)	12%	6%	8%	0%	9%	5%	4%	5%	6%	0%	9%	0%	
Turn Type	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	Permitted	
Protected Phases	2.9	6.10	6.10	8	8	8	8	8	8	8	8	8	
Permitted Phases	2.9	6.10	6.10	8	8	8	8	8	8	8	8	8	
Actuated Green, G (s)	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	
Effective Green, g (s)	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1119	1119	1119	1031	1031	1031	362	362	330	330	330	330	
v/s Ratio Prot	60.35	60.35	60.35	0.23	0.23	0.23	60.11	60.11	0.02	0.02	0.02	0.02	
v/c Ratio Perm	0.51	0.51	0.51	0.34	0.34	0.34	0.45	0.45	0.09	0.09	0.09	0.09	
v/c Ratio	6.7	6.7	6.7	5.7	5.7	5.7	30.9	30.9	28.1	28.1	28.1	28.1	
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Progression Factor	0.4	0.4	0.4	0.2	0.2	0.2	0.9	0.9	0.1	0.1	0.1	0.1	
Incremental Delay, d2	7.1	7.1	7.1	5.9	5.9	5.9	31.7	31.7	28.2	28.2	28.2	28.2	
Delay (s)	A	A	A	A	A	A	C	C	C	C	C	C	
Level of Service	7.1	7.1	7.1	5.9	5.9	5.9	31.7	31.7	28.2	28.2	28.2	28.2	
Approach Delay (s)	A	A	A	A	A	A	C	C	C	C	C	C	
Approach LOS	A	A	A	A	A	A	C	C	C	C	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	11.1											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51												
Actuated Cycle Length (s)	95.1											Sum of lost time (s)	10.0
Intersection Capacity Utilization	60.9%											ICU Level of Service	B
Analysis Period (min)	15												
c Critical Lane Group													

25: Tubman Avenue & Dundas Street E

26: River Street & Dundas Street E

03-22-2023

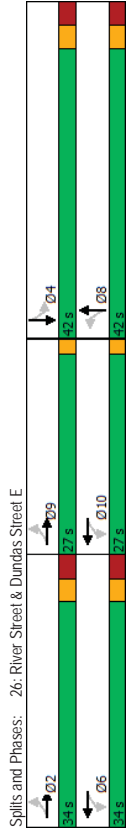
03-22-2023

2032 Future Background PM Model (FutRN)

2032 Future Background PM Model (FutRN)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	SBR
Lane Configurations		4		4					4		4
Traffic Volume (veh/h)	0	515	10	10	325	0	0	0	10	0	5
Future Volume (Veh/h)	0	515	10	10	325	0	0	0	10	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	0	542	11	11	342	0	0	0	11	0	5
Pedestrians	10			10			130		11		50
Lane Width (m)	3.5			3.5			0.0		3.5		3.5
Walking Speed (m/s)	1.1			1.1			1.1		1.1		1.1
Percent Blockage	1			1			0		4		4
Right turn flare (veh)											
Median type	None			None							
Median storage (veh)											
Upstream signal (m)	99			98							
pX platoon unblocked											
VC, conflicting volume	392			683			1056	1092	688	972	1097
VC1, stage 1 conf vol											
VC2, stage 2 conf vol											
VCU, unblocked vol	392			555			987	1028	561	889	1034
IC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5
IC, 2 stage (s)											
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	100			99			100	100	100	95	100
CM capacity (veh/h)	1125			887			186	193	455	209	191
Direction, Lane #	EB 1	WB 1	SB 1								
Volume Total	553	353	16								
Volume Left	0	11	11								
Volume Right	11	0	5								
cSH	1125	887	263								
Volume to Capacity	0.00	0.01	0.06								
Queue Length 95th (m)	0.0	0.3	1.5								
Control Delay (s)	0.0	0.4	19.6								
Lane LOS	A	A	C								
Approach Delay (s)	0.0	0.4	19.6								
Approach LOS	C	C	C								
Intersection Summary											
Average Delay											0.5
Intersection Capacity Utilization											43.9%
Analysis Period (min)											15
											A
											ICU Level of Service

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Configurations		4		4			4						
Traffic Volume (vph)	25	440	95	210	45	365	105	445					
Future Volume (vph)	25	440	95	210	45	365	105	445					
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA					
Protected Phases	2, 9		6, 10		8		4						
Permitted Phases	2		6		8		4						
Detector Phase													
Switch Phase													
Minimum Initial (s)					21.0		21.0		21.0		21.0		5.0
Minimum Split (s)					27.0		27.0		27.0		27.0		27.0
Total Split (s)					42.0		42.0		42.0		34.0		27.0
Total Split (%)					40.8%		40.8%		40.8%		33%		26%
Yellow Time (s)					3.0		3.0		3.0		3.0		2.0
All-Red Time (s)					3.0		3.0		3.0		3.0		0.0
Lost Time Adjust (s)					-1.0		-1.0		-1.0		-1.0		0.0
Total Lost Time (s)					5.0		5.0		5.0		5.0		0.0
Lead-Lag													
Lead-Lag Optimize?													
Recall Mode													
Act Effct Green (s)		31.8		31.8		37.7		37.7		37.7			
Actuated g/C Ratio		0.40		0.40		0.47		0.47		0.47			
v/C Ratio		0.82		0.85		0.21		0.79		0.58			
Control Delay		31.5		37.3		19.6		28.2		34.8			
Queue Delay		0.0		0.0		0.0		0.0		0.0			
Total Delay		31.5		37.3		19.6		28.2		34.8			
LOS		C		D		B		C		C			
Approach Delay		31.5		37.3		27.6		27.4		27.4			
Approach LOS		C		D		C		C		C			
Intersection Summary													
Cycle Length		103											
Actuated Cycle Length		79.7											
Natural Cycle		95											
Control Type		Actuated-Uncoordinated											
Maximum v/C Ratio		0.85											
Intersection Signal Delay		30.3											
Intersection Capacity Utilization		120.3%											
Analysis Period (min)		15											



Queues 2032 Future Background PM Model (FutRN) 03-22-2023  
 26: River Street & Dundas Street E

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	552	421	47	610	111	552
Lane Group Flow (vph)	0.82	0.85	0.21	0.79	0.58	0.72
v/c Ratio	31.5	37.3	19.6	28.2	34.8	26.0
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	31.5	37.3	19.6	28.2	34.8	26.0
Total Delay	70.0	52.4	3.7	64.4	10.6	57.3
Queue Length 50th (m)	103.3	86.0	16.6	#192.0	#49.6	#170.6
Queue Length 95th (m)	73.4	80.5		131.0		118.9
Internal Link Dist (m)			20.0		25.0	
Turn Bay Length (m)						
Base Capacity (vph)	711	523	227	777	193	769
Station Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.80	0.21	0.79	0.58	0.72

**Intersection Summary**  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN) 03-22-2023  
 26: River Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+	+									
Traffic Volume (vph)	25	440	60	95	210	95	45	365	215	105	445	80
Future Volume (vph)	25	440	60	95	210	95	45	365	215	105	445	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0						5.0			5.0		5.0
Lane Util. Factor	1.00						1.00			1.00		1.00
Frbp. ped/bikes	0.98			0.97			1.00	0.94		1.00	0.97	
Frbp. psd/bikes	1.00			0.99			0.96	1.00		0.96	1.00	
Frt	1.00			0.97			1.00	0.94		1.00	0.98	
Flt Protected	1.00			0.99			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1724			1637			1533	1633		1591	1624	
Flt Permitted	0.97			0.73			0.28	1.00		0.23	1.00	
Satd. Flow (perm)	1676			1214			460	1633		393	1624	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	463	63	100	221	100	47	384	226	111	468	84
RTOR Reduction (vph)	0	5	0	0	13	0	0	17	0	0	5	0
Lane Group Flow (vph)	0	547	0	0	408	0	47	593	0	111	547	0
Confl. Peds. (#/hr)	55	75	75	75	75	55	75	75	75	75	75	5
Confl. Bikes (#/hr)			25			20			10			5
Heavy Vehicles (%)	9%	5%	0%	1%	9%	0%	5%	3%	0%	2%	12%	0%
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm
Protected Phases	2.9			6.10			8				4	
Permitted Phases	2.9			6.10			8				4	
Actuated Green, G (s)	36.5			36.5			36.7	36.7			36.7	36.7
Effective Green, g (s)	37.5			37.5			37.7	37.7			37.7	37.7
Actuated g/C Ratio	0.46			0.46			0.46	0.46			0.46	0.46
Clearance Time (s)							6.0	6.0			6.0	6.0
Vehicle Extension (s)							3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	774			560			213	758			182	754
v/s Ratio Prot							0.36				0.34	
v/s Ratio Perm	0.33			0.34			0.10				0.28	
v/c Ratio	0.71			0.73			0.22	0.78			0.61	0.72
Uniform Delay, d1	17.5			17.7			13.0	18.3			16.3	17.6
Progression Factor	1.00			1.00			1.00	1.00			1.00	1.00
Incremental Delay, d2	3.0			4.7			0.5	5.3			5.7	3.5
Delay (s)	20.4			22.4			13.5	23.6			21.9	21.0
Level of Service	C			C			B	C			C	C
Approach Delay (s)	20.4			22.4			22.9				21.2	
Approach LOS	C			C			C				C	C
Intersection Summary												
HCM 2000 Control Delay	21.7 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.79											
Actuated Cycle Length (s)	81.2 Sum of lost time (s) 11.0											
Intersection Capacity Utilization	120.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 27: Dreamer's Way & Gerrard Street E

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (veh/h)	830	55	10	430	0	0
Future Volume (Veh/h)	830	55	10	430	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	874	58	11	453	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)						
Upstream signal (m)	90			162		
pX platoon unblocked	0.87			0.87	0.87	0.87
VC, conflicting volume	932			1152	466	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	619			871	82	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
p0 queue free %	2.2			3.5	3.3	
IF (s)	99			100	100	
CM capacity (veh/h)	844			252	840	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volumes Total	583	349	162	302		
Volume Left	0	0	11	0		
Volume Right	0	58	0	0		
cSH	1700	1700	844	1700		
Volumes to Capacity	0.34	0.21	0.01	0.18		
Queue Length 95th (m)	0.0	0.0	0.3	0.0		
Control Delay (s)	0.0	0.0	0.8	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0		0.3			
Approach LOS			A			
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	28.0%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 29: Sumach Street & Site Driveway

03-22-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	15	125	0	0	0
Future Volume (Veh/h)	0	15	125	0	0	0
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	16	132	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)						
Upstream signal (m)						55
pX platoon unblocked						
VC, conflicting volume	132	132		132		
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	132	132		132		
IC, single (s)	6.4	6.2		4.1		
IC, 2 stage (s)						
p0 queue free %	3.5	3.3		2.2		
IF (s)	100	98		100		
CM capacity (veh/h)	867	923		1466		
Direction, Lane #	WB 1	NB 1				
Volumes Total	16	132				
Volume Left	0	0				
Volume Right	16	0				
cSH	923	1700				
Volumes to Capacity	0.02	0.08				
Queue Length 95th (m)	0.4	0.0				
Control Delay (s)	9.0	0.0				
Lane LOS	A	A				
Approach Delay (s)	9.0	0.0				
Approach LOS	A	A				
Intersection Summary						
Average Delay	1.0					
Intersection Capacity Utilization	16.6%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 31: Street 'G' & Gerrard Street E

03-22-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔
Traffic Volume (veh/h)	950	0	0	565	0	5
Future Volume (Veh/h)	950	0	0	565	0	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1000	0	0	595	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)	171			80		
pX platoon unblocked		0.90		0.93		0.90
VC conflicting volume		1000		1298		500
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCU unblocked vol		773		838		216
IC single (s)		4.1		6.8		6.9
IC 2 stage (s)						
p0 queue free %		2.2		3.5		3.3
IF (s)		100		100		99
CM capacity (veh/h)		765		288		714
Direction_Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volumes Total	500	500	298	298	5	5
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	5	5
cSH	1700	1700	1700	1700	714	714
Volumes to Capacity	0.29	0.29	0.17	0.17	0.01	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2	0.2
Control Delay (s)	0.0	0.0	0.0	0.0	10.1	10.1
Lane LOS					B	B
Approach Delay (s)	0.0	0.0	0.0	10.1		
Approach LOS				B		
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	36.3%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Background PM Model (FutRN)  
 32: Oak Street & Street 'G'

03-22-2023

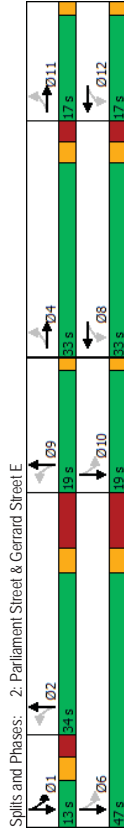
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	110	25	0	0	0
Future Volume (Veh/h)	5	110	25	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	116	26	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume		26		152		26
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCU unblocked vol		26		152		26
IC single (s)		4.1		6.4		6.2
IC 2 stage (s)						
p0 queue free %		2.2		3.5		3.3
IF (s)		100		100		100
CM capacity (veh/h)		1601		842		1056
Direction_Lane #	EB 1	WB 1				
Volumes Total	121	26				
Volume Left	5	0				
Volume Right	0	0				
cSH	1601	1700				
Volumes to Capacity	0.00	0.02				
Queue Length 95th (m)	0.1	0.0				
Control Delay (s)	0.3	0.0				
Lane LOS	A					
Approach Delay (s)	0.3	0.0				
Approach LOS						
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	13.2%					
ICU Level of Service	A					
Analysis Period (min)	15					

2032 Future Total AM Model  
04-04-2023  
HCM Unsignalized Intersection Capacity Analysis  
1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4A	4A	
Traffic Volume (veh/h)	0	0	5	575	495	60
Future Volume (Veh/h)	0	0	5	575	495	60
Sign Control	Sloped Free					
Grade	0%					
Peak Hour Factor	0.92					
Hourly flow rate (vph)	0	0	5	625	538	65
Pedestrians	80					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	39					
pX platoon unblocked	0.93					
VC, conflicting volume	978					
VC1, stage 1 conf vol	382					
VC2, stage 2 conf vol	683					
VCu, unblocked vol	820					
IC, single (s)	6.8					
IC, 2 stage (s)	6.9					
p0 queue free %	3.5					
IF (s)	3.3					
CM capacity (veh/h)	100					
Direction, Lane #	NB 1		NB 2		SB 2	
Volume Total	213		417		244	
Volume Left	5		0		0	
Volume Right	0		0		65	
cSH	795		1700		1700	
Volumes to Capacity	0.01		0.25		0.21	
Queue Length 95th (m)	0.1		0.0		0.0	
Control Delay (s)	0.3		0.0		0.0	
Lane LOS	A		A		A	
Approach Delay (s)	0.1		0.0		0.0	
Approach LOS	A		A		A	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	22.7%					
Analysis Period (min)	15					
ICU Level of Service	A					

2032 Future Total AM Model  
04-04-2023  
Timings  
2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		4TB		4TB		4TB		4TB
Traffic Volume (vph)	25	250	65	555	110	345	85	340
Future Volume (vph)	25	250	65	555	110	345	85	340
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases	4 11 8 12 2 9 1 16 10 2 4 6 8							
Permitted Phases	4 4 4 8 8 8 2 2 1 16							
Detector Phase								
Switch Phase								
Minimum Initial (s)	6.0							
Minimum Split (s)	12.5							
Total Split (s)	13.0							
Total Split (%)	11.2%							
Yellow Time (s)	3.3							
All-Red Time (s)	3.2							
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead Lag							
Recall Mode	Yes Yes							
Lead-Lag Optimize?	None							
Act Effct Green (s)	33.5		33.5		30.4		48.8	
Actuated g/C Ratio	0.36		0.36		0.33		0.52	
w/C Ratio	0.35		0.84		0.70		0.38	
Control Delay	21.1		34.4		32.6		13.5	
Queue Delay	0.0		0.0		0.0		0.0	
Total Delay	21.1		34.4		32.6		13.5	
LOS	C		C		C		B	
Approach Delay	21.1		34.4		32.6		13.5	
Approach LOS	C		C		C		B	
Intersection Summary								
Cycle Length	116							
Actuated Cycle Length	93							
Natural Cycle	115							
Control Type	Actuated-Uncoordinated							
Maximum w/C Ratio	0.84							
Intersection Signal Delay	27.1							
Intersection Capacity Utilization	101.0%							
Analysis Period (min)	15							





Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	19.0	19.0	17.0	17.0
Total Split (s)	19.0	19.0	17.0	17.0
Total Split (%)	16%	16%	15%	15%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	368	873	526	521
v/c Ratio	0.35	0.84	0.70	0.38
Control Delay	21.1	34.4	32.6	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.1	34.4	32.6	13.5
Queue Length 50th (m)	19.2	60.4	37.2	21.2
Queue Length 95th (m)	39.3	111.1	68.4	43.5
Internal Link Dist (m)	33.0	63.9	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1042	1074	764	1397
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	0.35	0.81	0.69	0.37
Intersection Summary				

2. Parliament Street & Gerrard Street E

2032 Future Total AM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB				4TB		4TB		
Traffic Volume (vph)	25	250	75	65	555	210	110	345	45	85	340	70
Future Volume (vph)	25	250	75	65	555	210	110	345	45	85	340	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8		4.8			10.2			5.5		
Lane Util. Factor	0.95	0.95		0.95			0.95			0.95		
Fpb, ped/bikes	0.98	0.97		0.97			0.99			0.99		
Fpb, ped/bikes	1.00	1.00		1.00			0.99			0.99		
Frt	0.97	0.96		0.96			0.99			0.98		
Frt Protected	1.00	1.00		1.00			0.99			0.99		
Sat'd Flow (prot)	3315	3200		3200			3174			3199		
FIL Permitted	0.86	0.88		0.88			0.72			0.78		
Sat'd Flow (perm)	2855	2829		2829			2298			2518		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	263	79	68	584	221	116	363	47	89	358	74
RTOR Reduction (vph)	0	21	0	0	28	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	347	0	0	845	0	0	520	0	0	508	0
Conf. Peds. (#/hr)	80	85	85	80	85	80	85	120	120	120	85	85
Conf. Bikes (#/hr)			5		20			5		5		10
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	MA	Perm	NA	Perm	NA	Perm	NA	custom	MA	MA
Protected Phases	4 11			8 12			2 9			1 6 10		
Permitted Phases	4 11			8 12		2 9				6 10		
Actuated Green, G (s)	38.0			38.0			40.6			53.8		
Effective Green, g (s)	39.0			39.0			41.6			44.6		
Actuated g/C Ratio	0.41			0.41			0.43			0.47		
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1162			1151			997			1226		
v/s Ratio Prot				c0.30			60.23			c0.03		
v/s Ratio Perm	0.12			0.73			0.52			0.16		
v/c Ratio	0.30			0.73			0.52			0.41		
Uniform Delay, d1	19.2			24.0			19.8			17.0		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.1			2.5			0.5			0.2		
Delay (s)	19.3			26.5			20.3			17.2		
Level of Service	B			C			C			B		
Approach Delay (s)	19.3			26.5			20.3			17.2		
Approach LOS	B			C			C			B		

Intersection Summary

HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Regent Park Phases 4 & 5  
BA Group - NHY

Synchro 11 Report  
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3. Sackville Street & Gerrard Street E

2032 Future Total AM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB				4TB		4TB		
Traffic Volume (vph)	335	145	880	335	145	880	35			880	35	
Future Volume (vph)	335	145	880	335	145	880	35			880	35	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8		4.8			10.2			5.5		
Lane Util. Factor	0.95	0.95		0.95			0.95			0.95		
Fpb, ped/bikes	0.98	0.97		0.97			0.99			0.99		
Fpb, ped/bikes	1.00	1.00		1.00			0.99			0.99		
Frt	0.97	0.96		0.96			0.99			0.98		
Frt Protected	1.00	1.00		1.00			0.99			0.99		
Sat'd Flow (prot)	3315	3200		3200			3174			3199		
FIL Permitted	0.86	0.88		0.88			0.72			0.78		
Sat'd Flow (perm)	2855	2829		2829			2298			2518		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	263	79	68	584	221	116	363	47	89	358	74
RTOR Reduction (vph)	0	21	0	0	28	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	347	0	0	845	0	0	520	0	0	508	0
Conf. Peds. (#/hr)	80	85	85	80	85	80	85	120	120	120	85	85
Conf. Bikes (#/hr)			5		20			5		5		10
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	MA	Perm	NA	Perm	NA	Perm	NA	custom	MA	MA
Protected Phases	4 11			8 12			2 9			1 6 10		
Permitted Phases	4 11			8 12		2 9				6 10		
Actuated Green, G (s)	38.0			38.0			40.6			53.8		
Effective Green, g (s)	39.0			39.0			41.6			44.6		
Actuated g/C Ratio	0.41			0.41			0.43			0.47		
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1162			1151			997			1226		
v/s Ratio Prot				c0.30			60.23			c0.03		
v/s Ratio Perm	0.12			0.73			0.52			0.16		
v/c Ratio	0.30			0.73			0.52			0.41		
Uniform Delay, d1	19.2			24.0			19.8			17.0		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.1			2.5			0.5			0.2		
Delay (s)	19.3			26.5			20.3			17.2		
Level of Service	B			C			C			B		
Approach Delay (s)	19.3			26.5			20.3			17.2		
Approach LOS	B			C			C			B		

Intersection Summary

HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

Regent Park Phases 4 & 5  
BA Group - NHY

Synchro 11 Report  
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Timings

2032 Future Total AM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB				4TB		4TB		
Traffic Volume (vph)	335	145	880	335	145	880	35			880	35	
Future Volume (vph)	335	145	880	335	145	880	35			880	35	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8		4.8			10.2			5.5		
Lane Util. Factor	0.95	0.95		0.95			0.95			0.95		
Fpb, ped/bikes	0.98	0.97		0.97			0.99			0.99		
Fpb, ped/bikes	1.00	1.00		1.00			0.99			0.99		
Frt	0.97	0.96		0.96			0.99			0.98		
Frt Protected	1.00	1.00		1.00			0.99			0.99		
Sat'd Flow (prot)	3315	3200		3200			3174			3199		
FIL Permitted	0.86	0.88		0.88			0.72			0.78		
Sat'd Flow (perm)	2855	2829		2829			2298			2518		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	263	79	68	584	221	116	363	47	89	358	74
RTOR Reduction (vph)	0	21	0	0	28	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	347	0	0	845	0	0	520	0	0	508	0
Conf. Peds. (#/hr)	80	85	85	80	85	80	85	120	120	120	85	85
Conf. Bikes (#/hr)			5		20			5		5		10
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	MA	Perm	NA	Perm	NA	Perm	NA	custom	MA	MA
Protected Phases	4 11			8 12			2 9			1 6 10		
Permitted Phases	4 11			8 12		2 9				6 10		
Actuated Green, G (s)	38.0											

Queues  
3: Sackville Street & Gerrard Street E

HCM Signalized Intersection Capacity Analysis  
3: Sackville Street & Gerrard Street E

2032 Future Total AM Model  
04-04-2023

	EBT	WBT	SBT
Lane Group	406	1126	114
Lane Group Flow (vph)	0.20	0.67	0.28
v/c Ratio	5.6	11.1	33.4
Control Delay	0.0	0.0	0.0
Queue Delay	5.6	11.1	33.4
Total Delay	11.3	51.0	17.6
Queue Length 50th (m)	16.2	66.6	35.3
Queue Length 95th (m)	58.8	47.8	15.3
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)	2211	1880	412
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.18	0.60	0.28
<b>Intersection Summary</b>			

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4			4+4							4+4
Traffic Volume (vph)	0	335	35	145	880	0	0	0	0	55	35	15
Future Volume (vph)	0	335	35	145	880	0	0	0	0	55	35	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		4.0			4.0							4.7
Lane Util. Factor		0.95			0.95							1.00
Frbp. ped/bikes		0.98			1.00							0.99
Frbp. ped/bikes		1.00			0.99							0.90
Frt		0.99			1.00							0.98
Frt Protected		1.00			0.99							0.97
Sat'd. Flow (prot)		3171			3342							1560
Flt Permitted		1.00			0.80							0.97
Sat'd. Flow (perm)		3171			2707							1560
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	368	38	159	967	0	0	0	0	60	38	16
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	0	397	0	0	1126	0	0	0	0	0	0	109
Confl. Peds. (#/hr)	40	60	60	60	40	60	140	140	60	60	60	60
Confl. Bikes (#/hr)		15			75							5
Heavy Vehicles (%)	0%	10%	0%	9%	4%	0%	0%	0%	0%	0%	6%	6%
Turn Type	NA	Perm	NA	NA	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	2.9			6.10						4		
Permitted Phases				6.10								4
Actuated Green, G (s)	56.9			56.9						21.5		
Effective Green, g (s)	57.9			57.9						22.5		
Actuated g/C Ratio	0.67			0.67						0.26		
Clearance Time (s)												5.7
Vehicle Extension (s)												3.0
Lane Grp Cap (vph)	2132			1820						407		
v/s Ratio Prot	0.13											
v/s Ratio Perm				0.42						0.07		
v/c Ratio	0.19			0.62						0.27		
Uniform Delay, d1	5.3			7.9						25.3		
Progression Factor	1.00			1.00						1.00		
Incremental Delay, d2	0.0			0.6						0.4		
Delay (s)	5.3			8.5						25.6		
Level of Service	A			A						C		
Approach Delay (s)	5.3			8.5			0.0			25.6		
Approach LOS	A			A			A			C		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	8.9			HCM 2000 Level of Service			A					
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	86.1											
Sum of lost time (s)	9.7											
Intersection Capacity Utilization	69.1%											
ICU Level of Service	C											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 4: Gerrard Street E & Gifford Street

HCM Unsignalized Intersection Capacity Analysis  
 5: Gerrard Street E & Nasmith Avenue

2032 Future Total AM Model  
 04-04-2023

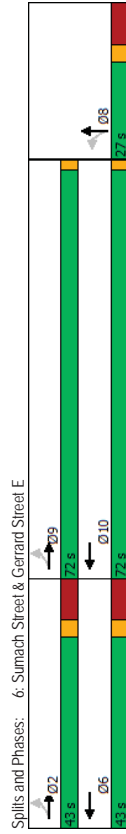
2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	385	1020	20	5	5
Future Volume (Veh/h)	5	385	1020	20	5	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	401	1062	21	5	5
Pedestrians		5	5		50	
Lane Width (m)		3.5	3.5	3.0		
Walking Speed (m/s)		1.1	1.1	1.1		
Percent Blockage		0	0		4	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
PX platoon unblocked	0.86			0.87	0.86	
VC conflicting volume	1133			1338	596	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	824			983	198	
IC single (s)	4.1			7.5	7.3	
IC 2 stage (s)						
p0 queue free %	2.2			3.8	3.5	
IF (s)	99			97	99	
CM capacity (veh/h)	673			163	622	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	139	267	708	375	10	10
Volume Left	5	0	0	0	5	5
Volume Right	0	0	0	21	5	5
cSH	673	1700	1700	1700	258	258
Volumes to Capacity	0.01	0.16	0.42	0.22	0.04	0.04
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.9	0.9
Control Delay (s)	0.5	0.0	0.0	0.0	19.5	19.5
Lane LOS	A				C	C
Approach Delay (s)	0.2		0.0		19.5	
Approach LOS			C			C
Intersection Summary						
Average Delay	0.2					
Intersection Capacity Utilization	40.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	385	1030	5	15	10
Future Volume (Veh/h)	5	385	1030	5	15	10
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	397	1062	5	15	10
Pedestrians					75	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					6	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
PX platoon unblocked	0.84			0.84	0.84	0.84
VC conflicting volume	1142			1348	608	
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	781			1027	144	
IC single (s)	4.1			6.9	7.1	
IC 2 stage (s)						
p0 queue free %	99			91	99	
IF (s)	2.2			3.6	3.4	
CM capacity (veh/h)	668			174	674	
Direction Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	137	265	708	359	25	25
Volume Left	5	0	0	0	15	15
Volume Right	0	0	0	5	10	10
cSH	668	1700	1700	1700	247	247
Volumes to Capacity	0.01	0.16	0.42	0.21	0.10	0.10
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.5	2.5
Control Delay (s)	0.5	0.0	0.0	0.0	21.2	21.2
Lane LOS	A				C	C
Approach Delay (s)	0.2		0.0		21.2	
Approach LOS			C			C
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	38.7%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings 2032 Future Total AM Model 04-04-2023  
 6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations		4↑	1↑	4↓				
Traffic Volume (vph)	5	395	925	10				
Future Volume (vph)	5	395	925	10				
Turn Type	Perm	NA	NA	NA				
Protected Phases		2, 9	6, 10	8	2	6	9	10
Permitted Phases	2, 9							
Detector Phase	2	2	6	8				
Switch Phase								
Minimum Initial (s)				15.0	11.0	11.0	5.0	5.0
Minimum Split (s)				25.4	26.2	26.2	72.0	72.0
Total Split (s)				27.0	43.0	43.0	72.0	72.0
Total Split (%)				19.0%	30%	30%	51%	51%
Yellow Time (s)				3.0	3.0	3.0	2.0	2.0
All-Red Time (s)				7.4	7.2	7.2	0.0	0.0
Lost Time Adjust (s)				-1.0				
Total Lost Time (s)				9.4				
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode				None	Min	Min	None	None
Act Effct Green (s)		56.5	56.5	20.0				
Actuated g/C Ratio		0.58	0.58	0.20				
v/c Ratio		0.25	0.64	0.84				
Control Delay		8.5	12.6	63.9				
Queue Delay		0.0	0.3	0.0				
Total Delay		8.5	13.0	63.9				
LOS		A	B	E				
Approach Delay		8.5	13.0	63.9				
Approach LOS		A	B	E				
Intersection Summary								
Cycle Length: 142								
Actuated Cycle Length: 97.7								
Natural Cycle: 125								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.84								
Intersection Signal Delay: 18.5								
Intersection Capacity Utilization 66.8%								
Analysis Period (min) 15								



Queues 2032 Future Total AM Model 04-04-2023  
 6: Summach Street & Gerrard Street E

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	460	1207	246
v/c Ratio	0.25	0.64	0.84
Control Delay	8.5	12.6	63.9
Queue Delay	0.0	0.3	0.0
Total Delay	8.5	13.0	63.9
Queue Length 50th (m)	18.0	62.6	26.4
Queue Length 95th (m)	22.5	70.8	#131.4
Internal Link Dist (m)	44.0	75.7	33.2
Turn Bay Length (m)			
Base Capacity (vph)	1897	1948	293
Starvation Cap Reductn	0	252	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.24	0.71	0.84
Intersection Summary			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

6: Sumach Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis  
 2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1		1+1			4					
Traffic Volume (vph)	5	395	0	0	925	125	110	110	95	0	0	0
Future Volume (vph)	5	395	0	0	925	125	110	110	95	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp, ped/bikes	1.00			0.97			0.94					
Frbp, ped/bikes	1.00			1.00			0.90					
Frt	1.00			0.98			0.94					
Flt Protected	1.00			1.00			0.98					
Sat'd. Flow (prot)	3399			3280			1456					
Flt Permitted	0.94			1.00			0.98					
Sat'd. Flow (perm)	3185			3280			1456					
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	454	0	0	1063	144	126	111	109	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	460	0	0	1198	0	0	228	0	0	0	0
Conf. Bikes (#/hr)	65	85	85	65	100		65	65	65			100
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Permi	MA	NA	NA	Permi	NA	NA	NA	NA	NA	NA	NA
Protected Phases		2.9		6.10		8						
Permitted Phases		2.9				8						
Effective Green, G (s)		65.3		65.3		18.9						
Actuated Green, g (s)		66.3		66.3		19.9						
Actuated g/C Ratio		0.69		0.69		0.21						
Clearance Time (s)						10.4						
Vehicle Extension (s)						3.0						
Lane Grp Cap (vph)		2185		2251		299						
v/s Ratio Prot				c0.37								
v/s Ratio Perm		0.14				0.16						
v/c Ratio		0.21		0.53		0.76						
Uniform Delay, d1		5.6		7.5		36.1						
Progression Factor		1.00		1.00		1.00						
Incremental Delay, d2		0.0		0.2		10.9						
Delay (s)		5.6		7.7		47.0						
Level of Service		A		A		D						
Approach Delay (s)		5.6		7.7		47.0						0.0
Approach LOS		A		A		D						A
Intersection Summary												
HCM 2000 Control Delay		12.3				HCM 2000 Level of Service						B
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		96.6				Sum of lost time (s)						19.6
Intersection Capacity Utilization		66.8%				ICU Level of Service						C
Analysis Period (min)		15										
c Critical Lane Group												

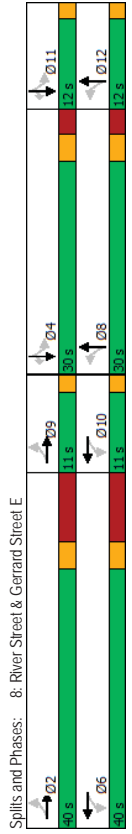
7: Street J/Sword Street & Gerrard Street E  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1		4+1								
Traffic Volume (veh/h)	0	475	15	0	1045	0	0	0	0	10	0	5
Future Volume (Veh/h)	0	475	15	0	1045	0	0	0	0	10	0	5
Sign Control		Free		Free			Stop		Stop			
Grade		0%		0%			0%		0%			
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
Hourly flow rate (vph)	0	500	16	0	1100	0	0	0	0	11	0	5
Pedestrians												75
Lane Width (m)												3.0
Walking Speed (m/s)												1.1
Percent Blockage												6
Right turn flare (veh)												
Median type							None					
Median storage (veh)												
Upstream signal (m)		100					91					
pX platoon unblocked	0.79			0.97			0.81	0.81	0.97	0.81	0.81	0.79
vC, conflicting volume	1175			516			1063	1683	258	1425	1691	625
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	696			448			446	1216	183	896	1226	2
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	94	100	99
dM capacity (veh/h)	679			1093			383	139	812	173	137	813
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1							
Volumes Total	333	183	367	733	16							
Volume Left	0	0	0	0	11							
Volume Right	0	16	0	0	5							
cSH	1700	1700	1093	1700	230							
Volumes to Capacity	0.20	0.11	0.00	0.43	0.07							
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.7							
Control Delay (s)	0.0	0.0	0.0	0.0	21.8							
Lane LOS					C							
Approach Delay (s)	0.0		0.0		21.8							
Approach LOS					C							
Intersection Summary												
Average Delay					0.2							
Intersection Capacity Utilization					38.9%							A
Analysis Period (min)					15							



Timings 2032 Future Total AM Model  
8: River Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	125	280	165	830	45	365	125	365	170			
Future Volume (vph)	125	280	165	830	45	365	125	365	170			
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	2.9	6.10	6.10	8.12	8.12	4.11	4.11	4.11	4.11	2	4	6
Permitted Phases	2	2	6	6	8	8	4	4	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)										23.0	19.0	23.0
Minimum Split (s)										33.8	30.0	33.8
Total Split (s)										40.0	30.0	40.0
Total Split (%)										43%	32%	43%
Yellow Time (s)										3.0	3.0	3.0
All-Red Time (s)										7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode										Min	Min	Min
Act Effct Green (s)	36.8		36.8	29.9	29.9	29.9	29.9	29.9	29.9			
Actuated g/C Ratio	0.45		0.45	0.37	0.37	0.37	0.37	0.37	0.37			
v/C Ratio	0.67		1.06	0.19	0.71	0.64	0.56	0.30	0.30			
Control Delay	22.9		67.7	20.8	28.7	38.2	24.6	8.9	8.9			
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	22.9		67.7	20.8	28.7	38.2	24.6	8.9	8.9			
LOS	C		E	C	C	D	C	C	A			
Approach Delay	22.9		67.7	28.0	23.1	23.1	23.1	23.1	23.1			
Approach LOS	C		E	C	C	C	C	C	C			
Intersection Summary												
Cycle Length	93											
Actuated Cycle Length	81.9											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/C Ratio	1.06											
Intersection Signal Delay	42.6											
Intersection Capacity Utilization	118.1%											
Analysis Period (min)	15											



Timings 2032 Future Total AM Model  
8: River Street & Gerrard Street E

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Split (s)	30.0	11.0	11.0	12.0	12.0
Total Split (s)	30.0	11.0	11.0	12.0	12.0
Total Split (%)	32%	12%	12%	13%	13%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode					
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					



HCM Unsignalized Intersection Capacity Analysis  
 9. Sackville Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
 10. Parliament Street & Oak Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	80	55	0	0	0	0	0	0	20	170
Future Volume (Veh/h)	0	0	80	55	0	0	0	0	0	0	20	170
Sign Control	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	0	0	104	71	0	0	0	0	0	0	26	221
Pedestrians	70	70	70	40	40	40	15	15	15	15	10	10
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	6	6	6	4	4	4	0	0	0	0	1	1
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	369	399	322	448	415	50	323				40	
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	369	399	322	448	415	50	323				40	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
IF (s)	100	100	85	82	100	100	100				98	
p0 capacity (veh/h)	503	482	679	392	472	979	1171				1527	
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	104	71	279									
Volume Left	0	71	26									
Volume Right	104	0	32									
cSH	679	392	1527									
Volumes to Capacity	0.15	0.18	0.02									
Queue Length 95th (m)	4.1	5.0	0.4									
Control Delay (s)	11.3	16.2	0.8									
Lane LOS	B	C	A									
Approach Delay (s)	11.3	16.2	0.8									
Approach LOS	B	C	A									
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			36.2%									A
Analysis Period (min)			15									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	105	395	15	5	475
Future Volume (Veh/h)	70	105	395	15	5	475
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	74	111	416	16	5	500
Pedestrians	260	260	5	5	175	175
Lane Width (m)	3.0	3.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	20	20	0	0	15	15
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)				151		143
pX platoon unblocked	0.99	0.99			0.99	
VC, conflicting volume	949	651			692	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	898	633			674	
IC, single (s)	6.8	7.0			4.1	
IC, 2 stage (s)						
p0 queue free %	3.5	3.3			2.2	
IF (s)	67	60			99	
p0 capacity (veh/h)	223	280			738	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	185	277	155	172	333	
Volume Left	74	0	0	5	0	
Volume Right	111	0	16	0	0	
cSH	254	1700	1700	738	1700	
Volumes to Capacity	0.73	0.16	0.09	0.01	0.20	
Queue Length 95th (m)	38.5	0.0	0.0	0.2	0.0	
Control Delay (s)	49.6	0.0	0.0	0.4	0.0	
Lane LOS	E	C	A	A	A	
Approach Delay (s)	49.6	0.0	0.0	0.1	0.0	
Approach LOS	E	C	A	A	A	
Intersection Summary						
Average Delay			8.2			
Intersection Capacity Utilization			38.1%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 11: Oak Street & Dreamer's Way

HCM Unsignalized Intersection Capacity Analysis  
 12: Regent Street & Oak Street

2032 Future Total AM Model  
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2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	20	125	0	15	55
Future Volume (Veh/h)	0	20	125	0	15	55
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	24	152	0	18	67
Pedestrians	15				40	
Lane Width (m)	3.5	3.5	3.0	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					216	207
VC, conflicting volume	192					
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	192				216	207
VCu, unblocked vol	4.1				6.4	6.3
IC, single (s)					3.5	3.4
IC, 2 stage (s)	2.2					
p0 queue free %	100				98	91
CM capacity (veh/h)	1351				753	774
Direction, Lane #	EB 1	WB 1	SB 1			
Volumes Total	24	152	85			
Volume Left	0	0	18			
Volume Right	0	0	67			
cSH	1700	1700	769			
Volumes to Capacity	0.01	0.09	0.11			
Queue Length 95th (m)	0.0	0.0	2.8			
Control Delay (s)	0.0	0.0	10.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			28.9%		ICU Level of Service	A
Analysis Period (min)			15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	35	0	0	95	30	25
Future Volume (Veh/h)	35	0	0	95	30	25
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	45	0	0	122	38	32
Pedestrians	15			10	30	
Lane Width (m)	3.5	3.5	3.0	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	1			1	2	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					75	212
VC, conflicting volume						85
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol						
IC, single (s)						6.4
IC, 2 stage (s)						6.2
p0 queue free %	100					3.3
CM capacity (veh/h)	1502				744	938
Direction, Lane #	EB 1	WB 1	NB 1			
Volumes Total	45	122	70			
Volume Left	0	0	38			
Volume Right	0	0	32			
cSH	1700	1700	822			
Volumes to Capacity	0.03	0.07	0.09			
Queue Length 95th (m)	0.0	0.0	2.1			
Control Delay (s)	0.0	0.0	9.8			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			28.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 14: Sackville Street & Oak Street

HCM Unsignalized Intersection Capacity Analysis  
 15: Sumach Street & Oak Street

2032 Future Total AM Model  
 04-04-2023

2032 Future Total AM Model  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop		Stop		Stop		Stop		Stop		Stop
Traffic Volume (vph)	0	35	15	0	20	0	0	0	0	60	175	70
Future Volume (vph)	0	35	15	0	20	0	0	0	0	60	175	70
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
Hourly flow rate (vph)	0	43	19	0	25	0	0	0	0	74	216	86
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total (vph)	62	25	376									
Volume Left (vph)	0	0	74									
Volume Right (vph)	19	0	86									
Head (s)	-0.08	0.00	0.01									
Departure Headway (s)	4.7	4.8	4.1									
Degree Utilization, x	0.08	0.03	0.43									
Capacity (veh/h)	703	680	857									
Control Delay (s)	8.1	8.0	10.2									
Approach Delay (s)	8.1	8.0	10.2									
Approach LOS	A	A	B									
Intersection Summary												
Delay	9.8											
Level of Service	A											
Intersection Capacity Utilization	42.1%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop		Stop		Stop		Stop		Stop		Stop
Traffic Volume (vph)	35	30	30	0	0	0	20	90	35	0	0	0
Future Volume (vph)	35	30	30	0	0	0	20	90	35	0	0	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	47	40	40	0	0	0	27	120	47	0	0	0
Direction, Lane #	EB 1	NB 1										
Volume Total (vph)	127	194										
Volume Left (vph)	47	27										
Volume Right (vph)	40	47										
Head (s)	-0.02	-0.04										
Departure Headway (s)	4.3	4.2										
Degree Utilization, x	0.15	0.22										
Capacity (veh/h)	800	837										
Control Delay (s)	8.1	8.3										
Approach Delay (s)	8.1	8.3										
Approach LOS	A	A										
Intersection Summary												
Delay	8.2											
Level of Service	A											
Intersection Capacity Utilization	34.9%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											

16: Tubman Avenue/Street 'J' & Oak Street  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	65	0	0	0	0	0	0	0	25	55	0
Future Volume (Veh/h)	0	65	0	0	0	0	0	0	0	25	55	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	87	0	0	0	0	0	0	0	33	73	0
Pedestrians	40	40	40	10	10	10	45	45	45	33	73	0
Lane Width (m)	3.5	3.5	3.5	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	4	4	4	0	0	0	0	0	0	0	0	0
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked												
VC, conflicting volume	0	132	132	208	132	142	97	132	40			
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	0	132	132	208	132	142	97	132	40			
IC, single (s)	4.1	4.1	4.1	7.1	6.5	6.7	7.1	6.5	6.2			
IC, 2 stage (s)												
IF (s)	2.2	2.2	2.2	3.5	4.0	3.8	3.5	4.0	3.3			
p0 queue free %	100	100	100	100	100	100	96	90	100			
CM capacity (veh/h)	1636	1466	1466	673	762	793	890	762	1000			
Direction, Lane #	EB 1	SB 1										
Volumes Total	87	106										
Volume Left	0	33										
Volume Right	0	0										
cSH	1700	798										
Volumes to Capacity	0.05	0.13										
Queue Length 95th (m)	0.0	3.5										
Control Delay (s)	0.0	10.2										
Lane LOS	B	B										
Approach Delay (s)	0.0	10.2										
Approach LOS	B	B										
Intersection Summary												
Average Delay		5.6										
Intersection Capacity Utilization		30.5%										A
Analysis Period (min)		15										

18: River Street & Oak Street  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	50	35	0	65	0	375	25	40	570	0
Future Volume (Veh/h)	40	0	50	35	0	65	0	375	25	40	570	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	44	0	55	38	0	71	0	412	27	44	626	0
Pedestrians	75	75	75	65	65	65	35	35	3.5	3.5	3.5	5
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	7	7	7	6	6	6	3	3	3	3	3	0
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked												
VC, conflicting volume	1290	1293	736	1294	1280	496	701	504				
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	866	869	600	870	853	228	559	239				
IC, single (s)	7.2	6.5	6.2	7.1	7.0	6.2	4.1	4.1				
IC, 2 stage (s)												
IF (s)	3.6	4.0	3.3	3.5	4.5	3.3	2.2	2.2				
p0 queue free %	73	100	86	76	100	88	100	96				
CM capacity (veh/h)	165	213	388	160	181	601	810	997				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	99	109	439	670								
Volume Left	44	38	0	44								
Volume Right	55	71	27	0								
cSH	242	306	1700	997								
Volumes to Capacity	0.41	0.36	0.26	0.04								
Queue Length 95th (m)	14.3	11.8	0.0	1.1								
Control Delay (s)	29.7	23.1	0.0	1.1								
Lane LOS	D	C	A	A								
Approach Delay (s)	29.7	23.1	0.0	1.1								
Approach LOS	D	C	C	C								
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			75.8%									D
Analysis Period (min)			15									



19: Parliament Street & Cole Street

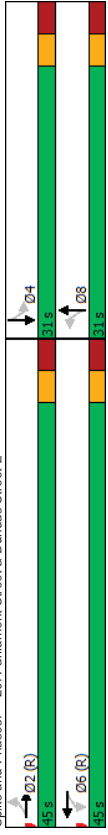
2032 Future Total AM Model  
04-04-2023

20: Parliament Street & Dundas Street E

2032 Future Total AM Model  
04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			←	←	←	←
Traffic Volume (veh/h)	0	0	410	20	25	520
Future Volume (Veh/h)	0	0	410	20	25	520
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	446	22	27	565
Pedestrians	250		10			15
Lane Width (m)	0.0	3.5	3.5			3.5
Walking Speed (m/s)	1.1	1.1	1.1			1.1
Percent Blockage	0		1			1
Right turn flare (veh)			None			None
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.94	0.94	499			718
VC1, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	927	337				570
IC, single (s)	6.8	6.9				4.2
IC, 2 stage (s)						
IF (s)	3.5	3.3				2.2
p0 queue free %	100	100				97
CM capacity (veh/h)	245	616				925
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	297	171	215	377		
Volume Left	0	0	27	0		
Volume Right	0	22	0	0		
cSH	1700	1700	925	1700		
Volumes to Capacity	0.17	0.10	0.03	0.22		
Queue Length 95th (m)	0.0	0.0	0.7	0.0		
Control Delay (s)	0.0	0.0	1.4	0.0		
Lane LOS			A			
Approach Delay (s)	0.0		0.5			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			45.7%			
Analysis Period (min)			15			
ICU Level of Service			A			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations			←	←	←	←	←	←
Traffic Volume (vph)	35	305	60	340	40	310	65	400
Future Volume (vph)	35	305	60	340	40	310	65	400
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		8	4
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	45.0	45.0	45.0	45.0	31.0	31.0	31.0	31.0
Total Split (%)	59.2%	59.2%	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)								
Lead-Lag	5.0		5.0		5.0		5.0	5.0
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.0	41.0	C-Min	C-Min	Min	Min	Min	Min
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.33	0.33	0.33	0.33
v/C Ratio	0.26	0.26	0.36	0.36	0.45	0.45	0.60	0.60
Control Delay	9.8	9.8	12.3	12.3	21.4	21.4	23.7	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	9.8	12.3	12.3	21.4	21.4	23.7	23.7
LOS	A	A	B	B	C	C	C	C
Approach Delay	9.8		12.3		21.4		23.7	
Approach LOS	A		B		C		C	
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 54 (7%), Referenced to phase 2EBTL and 6:WBTL, Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/C Ratio: 0.60								
Intersection Signal Delay: 17.1								
Intersection Capacity Utilization 93.3%								
Analysis Period (min) 15								
ICU Level of Service F								



	EBT	WBT	NBT	SBT
Lane Group	388	516	389	554
Lane Group Flow (vph)	0.26	0.36	0.45	0.60
v/c Ratio	9.8	12.3	21.4	23.7
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	9.8	12.3	21.4	23.7
Total Delay	13.4	27.3	22.9	34.1
Queue Length 50th (m)	23.6	39.0	32.0	45.6
Queue Length 95th (m)	85.0	103.5	45.0	56.1
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1529	1461	922	969
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	0.25	0.35	0.42	0.57
<b>Intersection Summary</b>				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4TB			4TB			4TB					
Traffic Volume (vph)	35	305	25	60	340	85	40	310	15	65	400	55	
Future Volume (vph)	35	305	25	60	340	85	40	310	15	65	400	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. 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	
Frbp. ped/bikes	0.99	0.99	0.99	0.97	0.97	0.99	0.99	0.99	0.99	0.98	0.98	0.98	
Frbp. psd/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Frt	1.00	1.00	1.00	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Flt Protected	3170	3170	3170	3065	3065	3113	3113	3113	3113	3247	3247	3247	
Satd. Flow (prot)	0.88	0.88	0.88	0.86	0.86	0.84	0.84	0.84	0.84	0.84	0.84	0.84	
Flt Permitted	2789	2789	2789	2638	2638	2641	2641	2641	2641	2753	2753	2753	
Satd. Flow (perm)	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	37	324	27	64	362	90	43	330	16	69	426	59	
RTOR Reduction (vph)	0	7	0	0	23	0	0	4	0	0	12	0	
Lane Group Flow (vph)	0	381	0	0	493	0	0	385	0	0	542	0	
Confl. Peds. (#/hr)	155	110	110	110	110	155	140	160	160	140	140	140	
Confl. Bikes (#/hr)	10	10	10	25	25	25	25	25	25	25	25	25	
Heavy Vehicles (%)	6%	10%	4%	22%	5%	13%	18%	11%	13%	2%	5%	5%	
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA	NA	
Protected Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Permitted Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Actuated Green, G (s)	40.0	40.0	40.0	40.0	40.0	40.0	24.0	24.0	24.0	24.0	24.0	24.0	
Effective Green, g (s)	41.0	41.0	41.0	41.0	41.0	41.0	25.0	25.0	25.0	25.0	25.0	25.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.33	0.33	0.33	0.33	0.33	0.33	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1504	1504	1504	1423	1423	1423	868	868	868	868	905	905	
v/s Ratio Prot	0.14	0.14	0.14	0.19	0.19	0.15	0.15	0.15	0.15	0.15	0.20	0.20	
v/c Ratio Perm	0.25	0.25	0.25	0.35	0.35	0.44	0.44	0.44	0.44	0.44	0.60	0.60	
Uniform Delay, d1	9.3	9.3	9.3	9.9	9.9	20.0	20.0	20.0	20.0	20.0	21.3	21.3	
Progression Factor	1.00	1.00	1.00	1.25	1.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4	0.4	0.6	0.6	0.4	0.4	0.4	0.4	0.4	1.1	1.1	
Delay (s)	9.7	9.7	9.7	13.0	13.0	20.4	20.4	20.4	20.4	20.4	22.4	22.4	
Level of Service	A	A	A	B	B	B	B	B	B	B	C	C	
Approach Delay (s)	9.7	9.7	9.7	13.0	13.0	20.4	20.4	20.4	20.4	20.4	22.4	22.4	
Approach LOS	A	A	A	B	B	B	B	B	B	B	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	16.7											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.3%											ICU Level of Service	F
Analysis Period (min)	15												
c Critical Lane Group													

21: Regent Street & Dundas Street E

22: Sackville Street & Dundas Street E

2032 Future Total AM Model  
04-04-2023

2032 Future Total AM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T	4T
Traffic Volume (veh/h)	10	380	10	10	460	35	15	10	5	20	10	20
Future Volume (Veh/h)	10	380	10	10	460	35	15	10	5	20	10	20
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	413	11	11	500	38	16	11	5	22	11	22
Pedestrians	20			5			70			80		
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2			0			6			7		
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)	127			1.00	1.24		1.00	1.00	1.00	1.00	1.00	1.00
pX platoon unblocked				494			830	1150	287	865	1137	369
VC, conflicting volume	618											
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	618			492			828	1149	285	863	1135	369
IC, single (s)	4.1			4.1			7.6	6.7	6.9	7.6	6.5	7.1
IC, 2 stage (s)												
p0 queue free %	2.2			2.2			3.6	4.1	3.3	3.5	4.0	3.4
IF (s)	99			99			92	93	99	88	94	96
CM capacity (veh/h)	903			1014			190	157	670	188	174	553
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 1					
Volume Total	218	218	261	288	32	55						
Volume Left	11	0	11	0	16	22						
Volume Right	0	11	0	38	5	22						
cSH	903	1700	1014	1700	198	250						
Volumes to Capacity	0.01	0.13	0.01	0.17	0.16	0.22						
Queue Length 95th (m)	0.3	0.0	0.2	0.0	4.3	6.2						
Control Delay (s)	0.6	0.0	0.5	0.0	26.7	23.5						
Lane LOS	A	A	A	D	C	C						
Approach Delay (s)	0.3		0.2	26.7	23.5							
Approach LOS			D	C								
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	36.7%											
Analysis Period (min)	15											
	ICU Level of Service A											

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4T	4T	4T	4T	4T	4T	4T
Traffic Volume (vph)	415	10	405	45	0	105	50
Future Volume (vph)	415	10	405	45	0	105	50
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4
Permitted Phases	2	6	6	8	8	4	4
Detector Phase							
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Spill (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	46.3	46.3	46.3	19.7	19.7	19.7	19.7
Actuated g/C Ratio	0.61	0.61	0.61	0.26	0.26	0.26	0.26
v/C Ratio	0.24	0.24	0.42	0.21	0.21	0.64	0.64
Control Delay	7.8	6.8	6.8	12.0	12.0	29.9	29.9
Queue Delay	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Total Delay	7.8	7.1	7.1	12.0	12.0	29.9	29.9
LOS	A	A	A	B	B	C	C
Approach Delay	7.8	7.1	7.1	12.0	12.0	29.9	29.9
Approach LOS	A	A	A	B	B	C	C
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: T1 (14%), Referenced to phase 2EBT and 6,WBTL Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/C Ratio: 0.64							
Intersection Signal Delay: 12.0							
Intersection Capacity Utilization 54.1%							
Analysis Period (min) 15							
ICU Level of Service A							

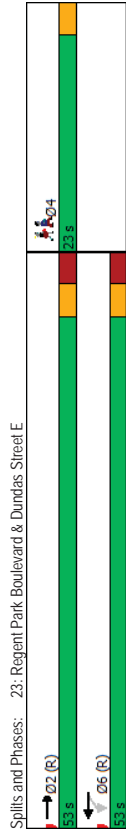


Spills and Phases: 22: Sackville Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	463	437	73	227
Lane Group Flow (vph)	0.24	0.42	0.21	0.64
v/c Ratio	7.8	6.8	12.0	29.9
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	7.8	7.1	12.0	29.9
Total Delay	9.0	31.0	3.2	25.0
Queue Length 50th (m)	33.9	10.6	11.5	43.2
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)	2003	1064	372	390
Base Capacity (vph)	0	207	0	0
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.51	0.20	0.58
<b>Intersection Summary</b>				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4			4			4+4				
Traffic Volume (vph)	0	415	25	10	405	0	45	0	25	105	50	60
Future Volume (vph)	0	415	25	10	405	0	45	0	25	105	50	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.99	0.99	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.98	0.98	0.98
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	0.97	0.95	0.95	0.95
Frt	0.99	0.99	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.98	0.98	0.98
Flt Protected	0.99	0.99	1.00	1.00	1.00	0.97	0.97	0.97	0.97	0.95	0.95	0.95
Sat'd. Flow (prot)	3230	3230	1736	1736	1569	1569	1569	1569	1569	1566	1566	1566
Flt Permitted	1.00	1.00	0.99	0.99	0.74	0.74	0.74	0.74	0.74	0.81	0.81	0.81
Sat'd. Flow (perm)	3230	3230	1716	1716	1192	1192	1192	1192	1192	1296	1296	1296
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	437	26	11	426	0	47	0	26	111	53	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	463	0	0	437	0	0	41	0	0	208	0
Confl. Peds. (#/hr)	65	85	85	85	65	65	65	60	60	60	60	65
Confl. Bikes (#/hr)	10	10	10	10	25	25	25	25	25	25	25	25
Heavy Vehicles (%)	0%	8%	13%	0%	8%	0%	0%	0%	8%	6%	2%	4%
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	2	6	6	6	6	6	8	8	8	8	8	4
Permitted Phases	45.3	45.3	45.3	45.3	45.3	45.3	45.3	45.3	45.3	45.3	45.3	45.3
Actuated Green, G (s)	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3	46.3
Effective Green, g (s)	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Actuated g/C Ratio	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	1967	1967	1045	1045	308	308	308	308	308	308	308	308
Lane Grp Cap (vph)	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
v/s Ratio Perm	0.24	0.24	0.42	0.42	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
v/c Ratio	6.8	6.8	7.8	7.8	21.6	21.6	21.6	21.6	21.6	24.9	24.9	24.9
Uniform Delay, d1	0.98	0.98	0.62	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.3	0.3	1.2	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Incremental Delay, d2	6.9	6.9	6.0	6.0	21.8	21.8	21.8	21.8	21.8	28.4	28.4	28.4
Delay (s)	A	A	A	A	C	C	C	C	C	C	C	C
Level of Service	6.9	6.9	6.0	6.0	21.8	21.8	21.8	21.8	21.8	28.4	28.4	28.4
Approach Delay (s)	A	A	A	A	C	C	C	C	C	C	C	C
Approach LOS	A	A	A	A	C	C	C	C	C	C	C	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	11.5 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	76.0 Sum of lost time (s)											
Intersection Capacity Utilization	54.1% ICU Level of Service A											
Analysis Period (min)	15											
c Critical Lane Group												

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	525	15	415	4
Future Volume (vph)	525	15	415	
Turn Type	NA	Perm	NA	
Protected Phases	2	6	6	4
Permitted Phases		6	6	
Detector Phase	2	6	6	
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.9	4.9	4.9	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.39	0.31	0.31	
Control Delay	4.4	4.4	4.6	
Queue Delay	0.0	0.0	0.0	
Total Delay	4.4	4.4	4.6	
LOS	A	A	A	
Approach Delay	4.4	4.4	4.6	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 8 (1%) Referenced to phase 2:EBT and 6:WBT, Start of 1st Green				
Natural Cycle: 55				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.39				
Intersection Signal Delay: 4.5				
Intersection Capacity Utilization 53.4%				
Analysis Period (min) 15				



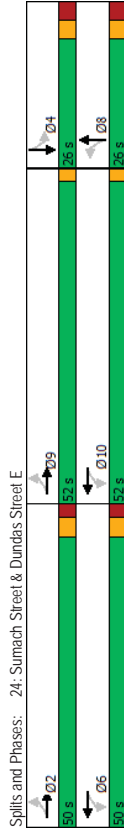
Lane Group	EBT	WBT
Lane Group Flow (vph)	568	448
v/c Ratio	0.39	0.31
Control Delay	4.4	4.6
Queue Delay	0.0	0.0
Total Delay	4.4	4.6
Queue Length 50th (m)	9.8	0.0
Queue Length 95th (m)	31.8	45.2
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1466	1446
Starvation Cap Reductn	17	114
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.34
<b>Intersection Summary</b>		

2032 Future Total AM Model  
04-04-2023  
HCM Signalized Intersection Capacity Analysis  
23: Regent Park Boulevard & Dundas Street E

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Volume (vph)	525	20	15	415	0	0
Future Volume (vph)	525	20	15	415	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.99		1.00			
Frbp. ped/bikes	1.00		1.00			
Frt	1.00		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1718		1729			
Flt Permitted	1.00		0.98			
Sat'd Flow (perm)	1718		1694			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	547	21	16	432	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	567	0	0	448	0	0
Conf. Peds. (#/hr)	125	125	125	40	60	60
Heavy Vehicles (%)	8%	0%	9%	8%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases	6		6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1358		1339			
v/s Ratio Prot	0.33		0.26			
v/s Ratio Perm	0.42		0.33			
v/s Ratio	2.5		2.3			
Uniform Delay, d1	0.82		1.00			
Progression Factor	0.9		0.7			
Incremental Delay, d2	3.0		2.9			
Delay (s)	A		A			
Level of Service	A		A			
Approach Delay (s)	3.0		2.9	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.9		2.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.37		0.37			
Actuated Cycle Length (s)	76.0		76.0	Sum of lost time (s)	7.9	
Intersection Capacity Utilization	53.4%		53.4%	ICU Level of Service	A	
Analysis Period (min)	15		15			
c. Critical Lane Group						

2032 Future Total AM Model  
04-04-2023  
Timings  
24: Sumach Street & Dundas Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBL	Ø2	Ø6	Ø9	Ø10
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB				
Traffic Volume (vph)	15	465	30	405	15	30	60	0				
Future Volume (vph)	15	465	30	405	15	30	60	0				
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA				
Protected Phases	2,9		6,10		8		4					
Detector Phase	2		6		8		4					
Switch Phase												
Minimum Initial (s)	20.0		20.0		20.0		20.0		16.0	16.0	5.0	5.0
Minimum Split (s)	26.0		26.0		26.0		26.0		21.0	21.0	52.0	52.0
Total Split (s)	26.0		26.0		26.0		26.0		50.0	50.0	52.0	52.0
Total Split (%)	20.3%		20.3%		20.3%		20.3%		39%	39%	41%	41%
Yellow Time (s)	3.0		3.0		3.0		3.0		3.0	3.0	2.0	2.0
All-Red Time (s)	3.0		3.0		3.0		3.0		2.0	2.0	0.0	0.0
Lost Time Adjust (s)					-1.0		-1.0					
Total Lost Time (s)					5.0		5.0					
Lead-Lag												
Lead-Lag Optimize?					None		None		Min	Min	None	None
Recall Mode												
Act Effct Green (s)	73.8		73.8		25.6		25.6					
Actuated g/C Ratio	0.78		0.78		0.27		0.27					
v/s Ratio	0.45		0.47		0.28		0.26					
Control Delay	7.1		7.1		29.1		27.5					
Queue Delay	1.7		0.4		0.0		0.0					
Total Delay	8.7		7.5		29.1		27.5					
LOS	A		A		C		C					
Approach Delay	8.7		7.5		29.1		27.5					
Approach LOS	A		A		C		C					
Intersection Summary												
Cycle Length	128											
Actuated Cycle Length	94.6											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/s Ratio	0.47											
Intersection Signal Delay	11.0								Intersection LOS: B			
Intersection Capacity Utilization	65.0%								ICU Level of Service C			
Analysis Period (min)	15											





Queues 2032 Future Total AM Model  
24: Sumach Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	570	560	109	76
Lane Group Flow (vph)	0.45	0.47	0.28	0.26
v/c Ratio	7.1	7.1	29.1	27.5
Control Delay	1.7	0.4	0.0	0.0
Queue Delay	8.7	7.5	29.1	27.5
Total Delay	43.7	42.5	12.0	7.3
Queue Length 50th (m)	63.0	62.3	31.1	23.0
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1258	1204	385	292
Station Cap Reductn	492	233	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.58	0.28	0.26
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Total AM Model  
24: Sumach Street & Dundas Street E

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations												
Traffic Volume (vph)	15	465	45	30	405	80	15	30	55	60	0	10
Future Volume (vph)	15	465	45	30	405	80	15	30	55	60	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Frbp. psd/bikes	1.00	1.00	0.99	0.99	0.99	0.96	0.96	0.96	0.96	0.96	0.92	0.92
Frt	1.00	0.99	0.99	1.00	0.98	0.98	0.93	0.93	0.93	0.93	0.98	0.98
Flt Protected	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.96	0.96
Sat'd. Flow (prot)	1655	1655	1631	1631	1631	1624	1624	1624	1624	1624	1634	1634
Flt Permitted	0.98	0.98	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Sat'd. Flow (perm)	1628	1628	1557	1557	1557	1557	1557	1557	1557	1557	1628	1628
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	505	49	33	440	87	16	33	60	65	0	11
RTOR Reduction (vph)	0	2	0	0	5	0	0	35	0	0	29	0
Lane Group Flow (vph)	0	568	0	0	555	0	0	74	0	0	47	0
Confl. Peds. (#/hr)	70	135	135	70	120	70	120	50	50	50	120	120
Confl. Bikes (#/hr)			5			30						
Heavy Vehicles (%)	13%	7%	14%	9%	8%	3%	11%	3%	10%	0%	3%	10%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2.9	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10
Permitted Phases	2.9	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10
Actuated Green, G (s)	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1	74.1
Effective Green, g (s)	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1273	1273	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218
v/s Ratio Prot												
v/s Ratio Perm	0.35	0.35	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
v/c Ratio	0.45	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Uniform Delay, d1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Delay (s)	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Level of Service	A	A	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Approach LOS	A	A	A	A	A	A	A	A	A	A	A	A
<b>Intersection Summary</b>												
HCM 2000 Control Delay	8.5 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.45											
Actuated Cycle Length (s)	96.0 Sum of lost time (s) 10.0											
Intersection Capacity Utilization	65.0% ICU Level of Service C											
Analysis Period (min)	15											
c Critical Lane Group												

25: Tubman Avenue & Dundas Street E

2032 Future Total AM Model  
04-04-2023

26: River Street & Dundas Street E

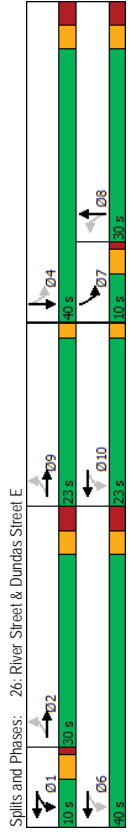
2032 Future Total AM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	565	15	5	485	0	0	0	0	25	0	30
Traffic Volume (veh/h)	0	565	15	5	485	0	0	0	0	25	0	30
Future Volume (Veh/h)	0	565	15	5	485	0	0	0	0	25	0	30
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	628	17	6	539	0	0	0	0	28	0	33
Pedestrians	5			5			115			45		
Lane Width (m)	3.5			3.5			0.0			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			4		
Right turn flare (veh)	None			None								
Median type	None			None								
Median storage (veh)	99			98								
Upstream signal (m)	0.83			0.90			0.88			0.88		
pX platoon unblocked	584			760			1348			756		
VC, conflicting volume												
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	401			679			1069			1077		
IC, single (s)	4.1			4.1			7.1			6.2		
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5			3.3		
p0 queue free %	100			99			100			100		
CM capacity (veh/h)	935			832			159			186		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	645	545	61									
Volume Left	0	6	28									
Volume Right	17	0	33									
cSH	935	832	295									
Volume to Capacity	0.00	0.01	0.21									
Queue Length 95th (m)	0.0	0.2	5.8									
Control Delay (s)	0.0	0.2	20.3									
Lane LOS	A	A	C									
Approach Delay (s)	0.0	0.2	20.3									
Approach LOS	C	C	C									
Intersection Summary												
Average Delay	1.1											
Intersection Capacity Utilization	48.1%											
Analysis Period (min)	15											
ICU Level of Service	A											

26: River Street & Dundas Street E

2032 Future Total AM Model  
04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	4	4	4	4	4	4	4	4				
Traffic Volume (vph)	15	510	110	320	75	325	155	440				
Future Volume (vph)	15	510	110	320	75	325	155	440				
Turn Type	Perm	NA	custom	NA	Perm	NA	pm+pt	NA				
Protected Phases	2	9	1	1	6	10	8	7	4	2	6	9
Permitted Phases	2	2	1	1	1	6	8	7	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0				21.0		5.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)	10.0				27.0		9.0	27.0	27.0	27.0	23.0	23.0
Total Split (s)	10.0				30.0		10.0	30.0	30.0	30.0	23.0	23.0
Total Split (%)	9.7%				29.1%		9.7%	38.8%	29%	39%	22%	22%
Yellow Time (s)	3.0				3.0		3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	1.0				3.0		3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)	-1.0				-1.0		-1.0	-1.0	-1.0	-1.0		
Total Lost Time (s)					5.0		5.0	5.0	5.0	5.0		
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	None	None	None	None		
Act Effct Green (s)	29.0				41.2		25.3	37.4	35.4			
Actuated g/C Ratio	0.34				0.49		0.30	0.30	0.44	0.42		
v/c Ratio	1.09				0.87		0.88	0.99	0.75	0.85		
Control Delay	93.8				34.0		47.1	68.4	41.3	37.3		
Queue Delay	0.8				0.0		0.0	0.0	0.0	0.0		
Total Delay	94.6				34.0		47.1	68.4	41.3	37.3		
LOS	F				C		D	E	D	D		
Approach Delay	94.6				34.0		65.4	38.2				
Approach LOS	F				C		E	D				
Intersection Summary												
Cycle Length	103											
Actuated Cycle Length	84.6											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	1.09											
Intersection Signal Delay	58.2											
Intersection Capacity Utilization	121.8%											
Analysis Period (min)	15											



26: River Street & Dundas Street E

26: River Street & Dundas Street E

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	628	510	80	490	165	569
v/c Ratio	1.09	0.87	0.58	0.99	0.75	0.85
Control Delay	93.8	34.0	47.1	68.4	41.3	37.3
Queue Delay	0.8	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	34.0	47.1	68.4	41.3	37.3
Queue Length 50th (m)	-117.5	55.4	10.0	69.6	14.4	71.3
Queue Length 95th (m)	#153.8	81.6	#38.9	#179.1	#57.2	#186.9
Internal Link Dist (m)	73.4	80.5	20.0	131.0	25.0	118.9
Turn Bay Length (m)						
Base Capacity (vph)	574	588	139	497	220	670
Station Cap Reductn	1	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.87	0.58	0.99	0.75	0.85
<b>Intersection Summary</b>						
-	Volume exceeds capacity, queue is theoretically infinite.					
-	Queue shown is maximum after two cycles.					
#	95th percentile volume exceeds capacity, queue may be longer.					
-	Queue shown is maximum after two cycles.					

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	510	65	110	320	50	75	325	135	155	440	95
Future Volume (vph)	15	510	65	110	320	50	75	325	135	155	440	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1694	1694	1694	1694	1694	1694	1694	1694	1694	1694	1694	1694
Flt Permitted	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Satd. Flow (perm)	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	543	69	117	340	53	80	346	144	165	468	101
RTOR Reduction (vph)	0	5	0	0	5	0	0	13	0	0	6	0
Lane Group Flow (vph)	0	623	0	0	505	0	80	477	0	165	563	0
Conf. Peds. (#/hr)	65	90	90	90	65	65	65	65	45	45	65	15
Conf. Bikes (#/hr)												
Heavy Vehicles (%)	0%	7%	4%	3%	7%	0%	9%	9%	1%	5%	12%	7%
Turn Type	Perm	NA	NA	custom	NA	NA	Perm	NA	NA	pm+pl	NA	NA
Protected Phases	2	9	1	1	6	10				7		4
Permitted Phases	2	9	6	10			8	8		4		4
Actuated Green, G (s)	33.6	33.6	43.7	39.7	25.2	25.2	24.2	24.2	34.3	34.3	34.3	34.3
Effective Green, g (s)	34.6	34.6	44.6	40.6	26.2	26.2	25.2	25.2	35.3	35.3	35.3	35.3
Actuated g/C Ratio	0.40	0.40	0.46	0.46	0.29	0.29	0.29	0.29	0.41	0.41	0.41	0.41
Clearance Time (s)							6.0	6.0	4.0	4.0	6.0	6.0
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	670	670	556	556	556	556	136	477	210	656	656	656
v/s Ratio Prot	c0.37	c0.37	c0.37	c0.37	c0.37	c0.37	c0.29	c0.29	c0.06	c0.35	c0.35	c0.35
v/c Ratio Perm	0.93	0.93	0.91	0.91	0.91	0.91	0.59	1.00	0.79	0.86	0.86	0.86
Uniform Delay, d1	24.5	24.5	21.5	21.5	26.0	30.4	19.7	19.7	23.1	23.1	23.1	23.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.6	19.6	18.5	18.5	6.4	40.7	17.4	17.4	10.7	10.7	10.7	10.7
Delay (s)	44.1	44.1	39.9	39.9	32.3	71.0	37.1	37.1	33.8	33.8	33.8	33.8
Level of Service	D	D	D	D	C	E	D	D	D	D	D	C
Approach Delay (s)	44.1	44.1	39.9	39.9	65.6	65.6	34.5	34.5	34.5	34.5	34.5	34.5
Approach LOS	D	D	D	D	E	E	D	D	D	D	D	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	45.4 HCM 2000 Level of Service D											
HCM 2000 Volume to Capacity ratio	1.00											
Actuated Cycle Length (s)	86.0 Sum of lost time (s) 17.0											
Intersection Capacity Utilization	121.8% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 27: Dreamers Way & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
 28: Dreamers Way & Site Driveway

04-04-2023

04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	350	30	5	830	0	0
Traffic Volume (veh/h)	350	30	5	830	0	0
Future Volume (Veh/h)	350	30	5	830	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	389	33	6	922	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None	None	None	None	None	None
Median type						
Median storage (veh)	88			164		
Upstream signal (m)	0.97			0.90		0.97
pX platoon unblocked	422			878		211
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	347			490		130
VCu, unblocked vol	4.1			6.8		6.9
IC, single (s)	2.2			3.5		3.3
IC, 2 stage (s)	99			100		100
p0 queue free %	1188			457		876
CM capacity (veh/h)						
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	259	163	313	615		
Volume Left	0	0	6	0		
Volume Right	0	33	0	0		
cSH	1700	1700	1188	1700		
Volumes to Capacity	0.15	0.10	0.01	0.36		
Queue Length 95th (m)	0.0	0.0	0.1	0.0		
Control Delay (s)	0.0	0.0	0.2	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0	0.1				
Approach LOS						
Intersection Summary						
Average Delay			0.0			A
Intersection Capacity Utilization		29.8%			ICU Level of Service	
Analysis Period (min)		15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	25	0	0	0	5	30
Traffic Volume (veh/h)	25	0	0	0	5	30
Future Volume (Veh/h)	25	0	0	0	5	30
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	0	0	0	6	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None	None	None	None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked	45				0	
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	45				0	
VCu, unblocked vol	6.4				6.2	
IC, single (s)	3.5				3.3	
IC, 2 stage (s)	97				100	
p0 queue free %	967				1091	
CM capacity (veh/h)						1636
Direction, Lane #	WB 1	SB 1				
Volume Total	28	39				
Volume Left	28	6				
Volume Right	0	0				
cSH	967	1636				
Volumes to Capacity	0.03	0.00				
Queue Length 95th (m)	0.7	0.1				
Control Delay (s)	8.8	1.1				
Lane LOS	A	A				
Approach Delay (s)	8.8	1.1				
Approach LOS	A	A				
Intersection Summary						
Average Delay			4.4			A
Intersection Capacity Utilization		13.3%			ICU Level of Service	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
 29: Sumach Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
 30: Street 'J' & Site Laneway

04-04-2023

2032 Future Total AM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	0	0	0	80	0	100	25	0	0	0
Future Volume (Veh/h)	35	0	0	0	0	80	0	100	25	0	0	0
Sign Control	Stop	0%	0%	Stop	0%	Free	0%	Free	0%	Free	0%	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	0	0	0	0	89	0	111	28	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None											
Median storage (veh)												
Upstream signal (m)	57											
pX platoon unblocked												
VC, conflicting volume	214	139	0	125	125	125	0	139				
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	214	139	0	125	125	125	0	139				
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
IF (s)	94	100	100	100	100	90	100	100				
p0 queue free %	676	756	1091	854	769	931	1636	1457				
CM capacity (veh/h)												
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	39	89	139									
Volume Left	39	0	0									
Volume Right	0	89	28									
cSH	676	931	1636									
Volume to Capacity	0.06	0.10	0.00									
Queue Length 95th (m)	1.4	2.4	0.0									
Control Delay (s)	10.7	9.3	0.0									
Lane LOS	B	A	A									
Approach Delay (s)	10.7	9.3	0.0									
Approach LOS	B	A	A									
Intersection Summary												
Average Delay	4.6											
Intersection Capacity Utilization	22.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	0	0	0	5	10
Future Volume (Veh/h)	70	0	0	0	5	10
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	78	0	0	0	6	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	23	0	0	0	0	0
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	23	0	0	0	0	0
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
IF (s)	92	100	100			
p0 queue free %	995	1091	1636			
CM capacity (veh/h)						
Direction, Lane #	WB 1	SB 1				
Volume Total	78	17				
Volume Left	78	6				
Volume Right	0	0				
cSH	995	1636				
Volume to Capacity	0.08	0.00				
Queue Length 95th (m)	1.9	0.1				
Control Delay (s)	8.9	2.6				
Lane LOS	A	A				
Approach Delay (s)	8.9	2.6				
Approach LOS	A	A				
Intersection Summary						
Average Delay	7.8					
Intersection Capacity Utilization	13.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 31: Street 'G' & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
 32: Oak Street & Street 'G'

2032 Future Total AM Model  
 04-04-2023

2032 Future Total AM Model  
 04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔↔	↔↔	↔	↔
Traffic Volume (veh/h)	360	0	0	895	0	10
Future Volume (Veh/h)	360	0	0	895	0	10
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	400	0	0	994	0	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	169		83			
pX platoon unblocked						
VC, conflicting volume		400		897		200
VC1, stage 1 conf vol						
VC2, stage 2 conf vol		400		531		200
VCu, unblocked vol		4.1		6.8		6.9
IC, single (s)						
IC, 2 stage (s)		2.2		3.5		3.3
p0 queue free %		100		100		99
ICM capacity (veh/h)		1170		411		814
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volumes Total	200	200	497	497	11	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	11	
cSH	1700	1700	1700	1700	814	
Volumes to Capacity	0.12	0.12	0.29	0.29	0.01	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	
Control Delay (s)	0.0	0.0	0.0	0.0	9.5	
Lane LOS	A	A	A	A	A	
Approach Delay (s)	0.0	0.0	0.0	9.5		
Approach LOS	A	A	A	A		
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	28.1%					
ICU Level of Service	A					
Analysis Period (min)	15					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔↔	↔↔	↔	↔
Traffic Volume (veh/h)	10	50	95	0	0	0
Future Volume (Veh/h)	10	50	95	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	56	106	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume		106		184		106
VC1, stage 1 conf vol						
VC2, stage 2 conf vol		106		184		106
VCu, unblocked vol		4.1		6.4		6.2
IC, single (s)						
IC, 2 stage (s)		2.2		3.5		3.3
p0 queue free %		99		100		100
ICM capacity (veh/h)		1488		804		954
Direction, Lane #	EB 1	WB 1				
Volumes Total	67	106				
Volume Left	11	0				
Volume Right	0	0				
cSH	1488	1700				
Volumes to Capacity	0.01	0.06				
Queue Length 95th (m)	0.2	0.0				
Control Delay (s)	1.3	0.0				
Lane LOS	A	A				
Approach Delay (s)	1.3	0.0				
Approach LOS	A	A				
Intersection Summary						
Average Delay	0.5					
Intersection Capacity Utilization	13.2%					
ICU Level of Service	A					
Analysis Period (min)	15					

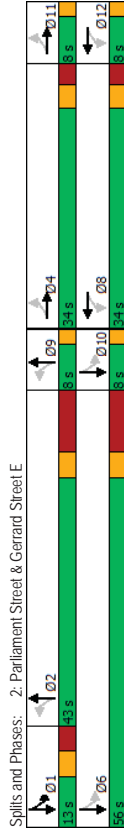


2032 Future Total PM Model  
04-04-2023  
HCM Unsignalized Intersection Capacity Analysis  
1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4A	4A	
Traffic Volume (veh/h)	0	0	10	520	600	75
Future Volume (Veh/h)	0	0	10	520	600	75
Sign Control	Free					
Grade	0%					
Peak Hour Factor	0.89					
Hourly flow rate (vph)	0	0	11	584	674	84
Pedestrians	150					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	39					
Upstream signal (m)	39					
pX platoon unblocked	1190					
VC, conflicting volume	534					
VC1, stage 1 conf vol	908					
VC2, stage 2 conf vol	1190					
VCU, unblocked vol	534					
IC, single (s)	6.8					
IC, 2 stage (s)	3.5					
p0 queue free %	100					
IF (s)	179					
CM capacity (veh/h)	494					
Direction, Lane #	NB 1		NB 2		SB 2	
Volumes Total	206		389		449	
Volume Left	11		0		0	
Volume Right	0		0		84	
cSH	692		1700		1700	
Volumes to Capacity	0.02		0.23		0.26	
Queue Length 95th (m)	0.4		0.0		0.0	
Control Delay (s)	0.7		0.0		0.0	
Lane LOS	A		A		A	
Approach Delay (s)	0.3		0.0		0.0	
Approach LOS	A		A		A	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	33.0%					
Analysis Period (min)	15					
ICU Level of Service	A					

2032 Future Total PM Model  
04-04-2023  
Timings  
2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		4TB		4TB		4TB		4TB
Traffic Volume (vph)	30	57.5	40	265	80	360	255	275
Future Volume (vph)	30	57.5	40	265	80	360	255	275
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA
Protected Phases	4 11							
Permitted Phases	4 4 4 8 8 8 2 2 1 1 6							
Switch Phase	4 4 4 8 8 8 2 2 1 1 6							
Minimum Initial (s)	6.0							
Minimum Split (s)	12.5							
Total Split (s)	13.0							
Total Split (%)	12.3%							
Yellow Time (s)	3.3							
All-Red Time (s)	3.2							
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead Lag							
Recall Mode	Yes Yes							
Act Effct Green (s)	33.3		33.3		30.2		54.3	
Actuated g/C Ratio	0.34		0.34		0.31		0.55	
v/C Ratio	0.66		0.50		0.84		0.55	
Control Delay	30.8		23.6		41.7		14.5	
Queue Delay	0.0		0.0		0.0		0.0	
Total Delay	30.8		23.6		41.7		14.5	
LOS	C		C		D		B	
Approach Delay	30.8		23.6		41.7		14.5	
Approach LOS	C		C		D		B	
Intersection Summary								
Cycle Length	106							
Actuated Cycle Length	98.1							
Natural Cycle	95							
Control Type	Actuated-Uncoordinated							
Maximum v/C Ratio	0.84							
Intersection Signal Delay	28.0							
Intersection Capacity Utilization	101.0%							
Analysis Period (min)	15							



Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	8.0	8.0	8.0	8.0
Total Split (s)	8.0	8.0	8.0	8.0
Total Split (%)	8%	8%	8%	8%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	701	458	618	619
v/c Ratio	0.66	0.50	0.84	0.55
Control Delay	30.8	23.6	41.7	14.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.8	23.6	41.7	14.5
Queue Length 50th (m)	61.7	31.6	56.7	33.0
Queue Length 95th (m)	81.4	46.6	#86.7	45.2
Internal Link Dist (m)	33.0	65.6	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1088	912	811	1183
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	0.64	0.50	0.76	0.52
Intersection Summary				

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



Queues  
3: Sackville Street & Gerrard Street E

2032 Future Total PM Model  
04-04-2023

	EBT	WBT	SBT
Lane Group	1094	682	209
Lane Group Flow (vph)	0.57	0.52	0.42
v/c Ratio	10.2	10.3	25.9
Control Delay	0.0	0.0	0.0
Queue Delay	10.2	10.3	25.9
Total Delay	41.6	25.5	23.2
Queue Length 50th (m)	55.7	37.1	48.6
Queue Length 95th (m)	57.2	47.8	15.3
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)	2150	1479	502
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.51	0.46	0.42
<b>Intersection Summary</b>			

HCM Signalized Intersection Capacity Analysis  
3: Sackville Street & Gerrard Street E

2032 Future Total PM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1			4+1							4+1
Traffic Volume (vph)	0	950	100	95	560	0	0	0	0	135	40	25
Future Volume (vph)	0	950	100	95	560	0	0	0	0	135	40	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		4.0			4.0							4.7
Lane Util. Factor		0.95			0.95							1.00
Frbp. ped/bikes		0.98			1.00							0.99
Frbp. ped/bikes		1.00			1.00							0.98
Frt		0.99			1.00							0.97
Flt Protected		3360			3359							1674
Satd. Flow (prot)		1.00			0.68							0.97
Flt Permitted		3360			2299							1674
Satd. Flow (perm)		0.96			0.96							0.96
Peak-hour factor, PHF		0.990			0.99							0.96
Adj. Flow (vph)		0			583							42
RTOR Reduction (vph)		0			0							0
Lane Group Flow (vph)		1084			682							205
Confl. Peds. (#/hr)		85			70							60
Confl. Bikes (#/hr)		60			15							10
Heavy Vehicles (%)		0%			0%							0%
Turn Type		NA			NA							NA
Protected Phases		2.9			6.10							4
Permitted Phases					6.10							4
Actuated Green, G (s)		43.3			43.3							20.6
Effective Green, g (s)		44.3			44.3							21.6
Actuated g/C Ratio		0.62			0.62							0.30
Clearance Time (s)												5.7
Vehicle Extension (s)												3.0
Lane Grp Cap (vph)		2078			1422							505
v/s Ratio Prot		c0.32										
v/s Ratio Perm		0.52			0.30							0.12
v/c Ratio		7.7			7.4							19.9
Uniform Delay, d1		1.00			1.00							1.00
Progression Factor		0.2			0.3							0.5
Incremental Delay, d2		7.9			7.7							20.4
Delay (s)		A			A							C
Level of Service		7.9			7.7							20.4
Approach Delay (s)		A			A							C
Approach LOS		A			A							C
<b>Intersection Summary</b>												
HCM 2000 Control Delay		9.1			HCM 2000 Level of Service							A
HCM 2000 Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		71.6			Sum of lost time (s)							9.7
Intersection Capacity Utilization		77.2%			ICU Level of Service							D
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
4: Gerrard Street E & Gifford Street

HCM Unsignalized Intersection Capacity Analysis  
5: Gerrard Street E & Nasmith Avenue

2032 Future Total PM Model  
04-04-2023

2032 Future Total PM Model  
04-04-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4A	4B		W	
Traffic Volume (veh/h)	10	1075	650	5	15	5
Future Volume (Veh/h)	10	1075	650	5	15	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	1265	765	6	18	6
Pedestrians		5			65	
Lane Width (m)		3.5	3.0		3.0	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0			5	
Right turn flare (veh)		None	None			
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
pX platoon unblocked	0.96			0.85	0.96	
VC, conflicting volume	836			1490	456	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	741			994	344	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
p0 queue free %	2.2			3.5	3.3	
IF (s)	98			91	99	
CM capacity (veh/h)	797			195	596	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	434	843	510	261	24	
Volume Left	12	0	0	0	18	
Volume Right	0	0	0	6	6	
cSH	797	1700	1700	1700	234	
Volumes to Capacity	0.02	0.50	0.30	0.15	0.10	
Queue Length 95th (m)	0.3	0.0	0.0	0.0	2.6	
Control Delay (s)	0.5	0.0	0.0	0.0	22.1	
Lane LOS	A				C	
Approach Delay (s)	0.2		0.0		22.1	
Approach LOS					C	
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	48.3%					
ICU Level of Service	A					
Analysis Period (min)	15					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4A	4B		W	
Traffic Volume (veh/h)	5	1085	650	5	5	5
Future Volume (Veh/h)	5	1085	650	5	5	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	1247	747	6	6	6
Pedestrians					60	
Lane Width (m)		3.0			3.0	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage					5	
Right turn flare (veh)		None	None			
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
pX platoon unblocked	0.93			0.88	0.93	
VC, conflicting volume	813			1446	436	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	661			894	258	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
p0 queue free %	2.2			3.5	3.3	
IF (s)	99			97	99	
CM capacity (veh/h)	836			236	667	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	422	831	498	255	12	
Volume Left	6	0	0	0	6	
Volume Right	0	0	0	6	6	
cSH	836	1700	1700	1700	349	
Volumes to Capacity	0.01	0.49	0.29	0.15	0.03	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.8	
Control Delay (s)	0.2	0.0	0.0	0.0	15.7	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		15.7	
Approach LOS					C	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	43.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings 2032 Future Total PM Model 04-04-2023

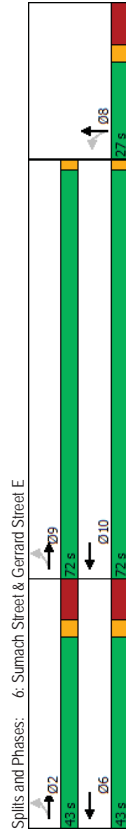
Queues 2032 Future Total PM Model 04-04-2023

6: Summach Street & Gerrard Street E

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations								
Traffic Volume (vph)	10	1080	590	25				
Future Volume (vph)	10	1080	590	25				
Turn Type	Perm	NA	NA	NA				
Protected Phases		2,9	6,10	8	2	6	9	10
Permitted Phases	2,9							
Detector Phase	2,9	2,9	6,10	8				
Switch Phase								
Minimum Initial (s)				15,0	11,0	11,0	5,0	5,0
Minimum Split (s)				25,4	26,2	26,2	72,0	72,0
Total Split (s)				27,0	43,0	43,0	72,0	72,0
Total Split (%)				19,0%	30%	30%	51%	51%
Yellow Time (s)				3,0	3,0	3,0	2,0	2,0
All-Red Time (s)				7,4	7,2	7,2	0,0	0,0
Lost Time Adjust (s)				-1,0				
Total Lost Time (s)				9,4				
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode				None	Min	Min	None	None
Act Effct Green (s)		56,3	56,3	17,4				
Actuated g/C Ratio		0,61	0,61	0,19				
v/c Ratio		0,56	0,36	0,64				
Control Delay		11,7	8,9	42,2				
Queue Delay		0,0	0,0	0,0				
Total Delay		11,7	8,9	42,2				
LOS		B	A	D				
Approach Delay		11,7	8,9	42,2				
Approach LOS		B	A	D				
Intersection Summary								
Cycle Length: 142								
Actuated Cycle Length: 92.5								
Natural Cycle: 125								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.64								
Intersection Signal Delay: 13.7								
Intersection Capacity Utilization 71.7%								
Analysis Period (min) 15								

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	1123	696	196
v/c Ratio	0.56	0.36	0.64
Control Delay	11.7	8.9	42.2
Queue Delay	0.0	0.0	0.0
Total Delay	11.7	8.9	42.2
Queue Length 50th (m)	57.1	28.2	30.1
Queue Length 95th (m)	72.2	37.7	#60.1
Internal Link Dist (m)	44.0	75.7	30.7
Turn Bay Length (m)			
Base Capacity (vph)	3208	3030	312
Starvation Cap Reductn	258	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.23	0.63
Intersection Summary			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			





6: Sumach Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis  
 2032 Future Total PM Model  
 04-04-2023

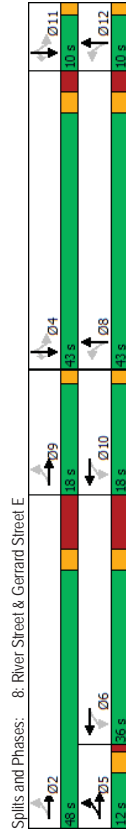
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4		4+4			4+4					
Traffic Volume (vph)	10	1080	0	0	590	85	65	25	100	0	0	0
Future Volume (vph)	10	1080	0	0	590	85	65	25	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp. ped/bikes	1.00			0.96			0.96					
Frbp. ped/bikes	1.00			1.00			0.95					
Frt	1.00			0.98			0.93					
Flt Protected	1.00			1.00			0.98					
Sat'd. Flow (prot)	3496			3255			1561					
Flt Permitted	0.95			1.00			0.98					
Sat'd. Flow (perm)	3312			3255			1561					
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	1113	0	0	608	88	67	26	103	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1123	0	0	687	0	0	170	0	0	0	0
Confl. Peds. (#/hr)	95	95	95	95	95	80	35	35	35	35	80	80
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perim	MA	NA	NA	Perm	NA	Perm	NA	NA	NA	NA	NA
Protected Phases		2.9		6.10			8					
Permitted Phases		2.9					8					
Effective Green, G (s)		63.4		63.4			16.3					
Actuated Green, g (s)		64.4		64.4			17.3					
Actuated g/C Ratio		0.70		0.70			0.19					
Clearance Time (s)							10.4					
Vehicle Extension (s)							3.0					
Lane Grp Cap (vph)		2315		2276			293					
v/s Ratio Prot				0.21								
v/s Ratio Perm		60.34					0.11					
v/c Ratio		0.49		0.30			0.58					
Uniform Delay, d1		6.3		5.3			34.1					
Progression Factor		1.00		1.00			2.9					
Incremental Delay, d2		0.2		0.1			37.0					
Delay (s)		6.5		5.4			37.0					
Level of Service		A		A			D					0.0
Approach Delay (s)		6.5		5.4			37.0					0.0
Approach LOS		A		A			D					A
Intersection Summary												
HCM 2000 Control Delay	9.1 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	92.1 Sum of lost time (s)											
Intersection Capacity Utilization	71.7% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

7: Street J/Sword Street & Gerrard Street E  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total PM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4		4+4			4+4					
Traffic Volume (veh/h)	0	1135	45	20	665	0	0	0	0	15	0	10
Future Volume (Veh/h)	0	1135	45	20	665	0	0	0	0	15	0	10
Sign Control		Free		Free			Stop		0%		0%	
Grade		0%		0%			0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1261	50	22	739	0	0	0	0	17	0	11
Pedestrians												65
Lane Width (m)												3.0
Walking Speed (m/s)												1.1
Percent Blockage												5
Right turn flare (veh)												
Median type		None					None					
Median storage (veh)												
Upstream signal (m)		100					91					
pX platoon unblocked	0.93		0.85				0.89		0.89	0.85	0.89	0.93
vC, conflicting volume	804		1311				1710		2134	656	1478	434
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCU, unblocked vol	646		1024				1208		1685	257	947	1713
IC, single (s)	4.1		4.1				7.5		6.5	6.9	7.5	6.5
IC, 2 stage (s)												7.1
IF (s)	2.2		2.2				3.5		4.0	3.3	3.5	4.0
p0 queue free %	100		96				100		100	100	90	100
dM capacity (veh/h)	842		586				115		77	639	173	74
649												
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1							
Volumes Total	841	470	268	493	28							
Volume Left	0	0	22	0	17							
Volume Right	0	50	0	0	11							
CSH	1700	1700	586	1700	243							
Volumes to Capacity	0.49	0.28	0.04	0.29	0.12							
Queue Length 95th (m)	0.0	0.0	0.9	0.0	2.9							
Control Delay (s)	0.0	0.0	1.4	0.0	21.8							
Lane LOS			A		C							
Approach Delay (s)	0.0	0.5			21.8							
Approach LOS			C									
Intersection Summary												
Average Delay	0.5											
Intersection Capacity Utilization	42.8% ICU Level of Service											
Analysis Period (min)	15											

Timings 2032 Future Total PM Model  
8: River Street & Gerrard Street E 04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB			
Traffic Volume (vph)	220	855	90	385	95	345	165	455	205			
Future Volume (vph)	220	855	90	385	95	345	165	455	205			
Turn Type	custom	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	5	5.2.9	6.10	6.10	8.12	8.12	4.11	4.11	4.11	2	4	6
Permitted Phases	5	5.2.9	6.10	6.10	8.12	8.12	4.11	4.11	4.11			
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0									23.0	19.0	23.0
Minimum Spilt (s)	10.0									33.8	30.0	33.8
Total Spilt (s)	12.0									48.0	43.0	36.0
Total Spilt (%)	10.1%									40%	36%	30%
Yellow Time (s)	3.0									3.0	3.0	3.0
All-Red Time (s)	1.0									7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None									Min	Min	Min
Act Effct Green (s)	55.6		36.5	39.4	39.4	39.4	39.4	39.4	39.4			
Actuated g/C Ratio	0.54		0.35	0.38	0.38	0.38	0.38	0.38	0.38			
v/C Ratio	0.91		0.95	0.49	0.77	1.00	0.67	0.32				
Control Delay	30.9		55.9	36.1	36.9	104.4	33.1	4.5				
Queue Delay	20.2		0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	51.1		55.9	36.1	36.9	104.4	33.1	4.5				
LOS	D		E	D	D	F	C	A				
Approach Delay	51.1		55.9	36.8	36.8	40.2						
Approach LOS	D		E	D	D	D						
Intersection Summary												
Cycle Length:	119											
Actuated Cycle Length:	103.1											
Natural Cycle:	105											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	1.00											
Intersection Signal Delay:	46.4											
Intersection Capacity Utilization:	116.6%											
Analysis Period (min):	15											



Timings 2032 Future Total PM Model  
8: River Street & Gerrard Street E 04-04-2023

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Spilt (s)	30.0	18.0	18.0	10.0	10.0
Total Spilt (s)	43.0	18.0	18.0	10.0	10.0
Total Spilt (%)	36%	15%	15%	8%	8%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues  
8: River Street & Gerrard Street E

HCM Signalized Intersection Capacity Analysis  
8: River Street & Gerrard Street E

2032 Future Total PM Model  
04-04-2023

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	1198	604	99	526	172	474	214
Lane Group Flow (vph)	0.91	0.95	0.49	0.77	1.00	0.67	0.32
v/c Ratio	30.9	55.9	36.1	36.9	104.4	33.1	4.5
Control Delay	20.2	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	51.1	55.9	36.1	36.9	104.4	33.1	4.5
Total Delay	81.5	57.3	16.7	98.3	-41.3	87.3	0.0
Queue Length 50th (m)	#141.5	#102.5	34.3	140.6	#82.9	122.9	14.3
Queue Length 95th (m)	67.0	81.6		126.5		61.7	
Internal Link Dist (m)			30.0				
Turn Bay Length (m)							
Base Capacity (vph)	1322	639	207	693	176	726	685
Stavation Cap Reductn	162	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.95	0.48	0.76	0.98	0.65	0.31
<b>Intersection Summary</b>							
-	Volume exceeds capacity, queue is theoretically infinite.						
-	Queue shown is maximum after two cycles.						
#	95th percentile volume exceeds capacity, queue may be longer.						
-	Queue shown is maximum after two cycles.						

	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	220	855	75	90	385	105	95	345	160	165	455
Future Volume (vph)	220	855	75	90	385	105	95	345	160	165	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5
Total Lost time (s)	3.0	9.0	9.8	9.8	9.8	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.99	0.99	0.98	0.98	0.98	1.00	0.98	1.00	1.00	1.00	0.96
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	1.00	1.00	1.00
Frt	0.99	0.99	0.97	0.97	0.97	1.00	0.95	1.00	1.00	1.00	0.85
Flt Protected	0.99	0.99	0.99	0.99	0.99	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3381	3272	3272	3272	3272	1625	1744	1643	1860	1860	1424
Flt Permitted	0.66	0.54				0.31	1.00	0.26	1.00	1.00	1.00
Satd. Flow (perm)	2267	1765				532	1744	452	1860	1424	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	891	78	94	401	109	99	359	167	172	474
RTOR Reduction (vph)	0	5	0	0	14	0	0	14	0	0	123
Lane Group Flow (vph)	0	1193	0	0	590	0	99	512	0	172	474
Conf. Peds. (#/hr)	40	80	80	40	15	40	15	40	40	15	10
Conf. Bikes (#/hr)	35	35	35	35	15	15	15	15	15	15	15
Heavy Vehicles (%)	3%	2%	3%	0%	4%	0%	3%	0%	1%	1%	2%
Turn Type	custom	NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	5	2	9	6	10	8	12	8	12	4
Permitted Phases	2	9	6	10	6	10	8	12	8	12	4
Actuated Green, G (s)	57.3	57.3	45.2	45.2	45.2	44.0	44.0	44.0	44.0	44.0	44.0
Effective Green, g (s)	48.5	48.5	46.2	46.2	46.2	45.0	45.0	45.0	45.0	45.0	45.0
Actuated g/C Ratio	0.46	0.46	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)											
Vehicle Extension (s)											
Lane Grp Cap (vph)	1140	1140	774	774	774	227	745	193	794	608	608
v/s Ratio Prot	c0.09	c0.09				0.29			0.25		
v/s Ratio Perm	c0.39	c0.39	0.33	0.33	0.33	0.19	0.19	0.38	0.38	0.38	0.06
v/c Ratio	1.05	1.05	0.76	0.76	0.76	0.44	0.69	0.89	0.89	0.89	0.15
Uniform Delay, d1	28.4	28.4	24.9	24.9	24.9	21.2	24.4	21.9	23.2	23.2	18.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.7	39.7	4.5	4.5	4.5	1.3	2.7	36.2	1.2	1.2	0.1
Delay (s)	68.1	68.1	29.4	29.4	29.4	22.6	27.1	64.1	24.4	24.4	18.6
Level of Service	E	E	C	C	C	C	C	E	C	C	B
Approach Delay (s)	68.1	68.1	29.4	29.4	29.4	26.4	26.4	30.9	30.9	30.9	30.9
Approach LOS	E	E	C	C	C	C	C	C	C	C	C
<b>Intersection Summary</b>											
HCM 2000 Control Delay	43.3 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	1.03										
Actuated Cycle Length (s)	105.3 Sum of lost time (s)										
Intersection Capacity Utilization	116.6% ICU Level of Service										
Analysis Period (min)	15										
c Critical Lane Group											

HCM Unsignalized Intersection Capacity Analysis  
 9. Sackville Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
 10. Parliament Street & Oak Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	40	30	0	0	0	0	0	45	130	60
Future Volume (Veh/h)	0	0	40	30	0	0	0	0	0	45	130	60
Sign Control	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	47	35	0	0	0	0	0	53	153	71
Pedestrians	60	3.5	3.5	3.5	0.0	0.0	5	5	5	15	15	15
Lane Width (m)	3.5	3.5	3.5	3.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	5	5	3	3	0	0	0	0	0	1	1	1
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	370	390	254	382	425	50	284			35		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	370	390	254	382	425	50	284			35		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
IF (s)	100	100	94	93	100	100	100			97		
p0 queue free %	504	486	748	481	464	979	1221			1540		
CM capacity (veh/h)												
Direction, Lane #	EB 1	WB 1	SB 1									
Volumes Total	47	35	277									
Volume Left	0	35	53									
Volume Right	47	0	71									
cSH	748	481	1540									
Volumes to Capacity	0.06	0.07	0.03									
Queue Length 95th (m)	1.5	1.8	0.8									
Control Delay (s)	10.1	13.1	1.7									
Lane LOS	B	B	A									
Approach Delay (s)	10.1	13.1	1.7									
Approach LOS	B	B	A									
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			37.8%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 11: Oak Street & Dreamer's Way

HCM Unsignalized Intersection Capacity Analysis  
 12: Regent Street & Oak Street

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	50	70	0	15	45
Future Volume (Veh/h)	0	50	70	0	15	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	54	75	0	16	48
Pedestrians		25	10		40	
Lane Width (m)		3.5	3.5		3.0	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		2	1		3	
Right turn flare (veh)						
Median type		None	None		None	
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume	115				179	140
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	115				179	140
IC single (s)	4.1				6.4	6.2
IC 2 stage (s)	2.2				3.5	3.3
p0 queue free %	100				98	94
CM capacity (veh/h)	1441				784	866
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	54	75	64			
Volume Left	0	0	16			
Volume Right	0	0	48			
cSH	1700	1700	844			
Volumes to Capacity	0.03	0.04	0.08			
Queue Length 95th (m)	0.0	0.0	1.9			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			27.3%		ICU Level of Service	A
Analysis Period (min)			15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	65	0	0	55	15	45
Future Volume (Veh/h)	65	0	0	55	15	45
Sign Control	Free	Free	Stop	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	78	0	0	66	18	54
Pedestrians	15			15	40	
Lane Width (m)	3.5			3.5	3.0	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume		118			199	133
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol		118			199	133
IC single (s)		4.1			6.4	6.2
IC 2 stage (s)		2.2			3.5	3.3
p0 queue free %		100			98	94
CM capacity (veh/h)		1438			760	882
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	78	66	72			
Volume Left	0	0	18			
Volume Right	0	0	54			
cSH	1700	1700	848			
Volumes to Capacity	0.05	0.04	0.08			
Queue Length 95th (m)	0.0	0.0	2.1			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			27.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 14: Sackville Street & Oak Street

HCM Unsignalized Intersection Capacity Analysis  
 15: Sumach Street & Oak Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	85	15	0	5	0	0	0	0	0	70	95
Future Volume (vph)	0	85	15	0	5	0	0	0	0	0	70	95
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	94	17	0	6	0	0	0	0	0	78	106
Direction, Lane #												
	EB 1	WB 1	SB 1									
Volume Total (vph)	111	6	223									
Volume Left (vph)	0	0	78									
Volume Right (vph)	17	0	39									
Had (s)	-0.06	0.00	0.03									
Departure Headway (s)	4.4	4.5	4.2									
Degree Utilization, x	0.13	0.01	0.26									
Capacity (veh/h)	787	739	831									
Control Delay (s)	8.0	7.6	8.7									
Approach Delay (s)	8.0	7.6	8.7									
Approach LOS	A	A	A									
Intersection Summary												
Delay	8.4											
Level of Service	A											
Intersection Capacity Utilization	37.6%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	60	70	25	0	0	0	0	5	165	75	0	0
Future Volume (vph)	60	70	25	0	0	0	0	5	165	75	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	66	77	27	0	0	0	0	5	181	82	0	0
Direction, Lane #												
	EB 1	NB 1										
Volume Total (vph)	170	268										
Volume Left (vph)	66	5										
Volume Right (vph)	27	82										
Had (s)	0.05	-0.11										
Departure Headway (s)	4.6	4.2										
Degree Utilization, x	0.22	0.31										
Capacity (veh/h)	745	826										
Control Delay (s)	8.8	9.1										
Approach Delay (s)	8.8	9.1										
Approach LOS	A	A										
Intersection Summary												
Delay	9.0											
Level of Service	A											
Intersection Capacity Utilization	40.6%											
Analysis Period (min)	15											
	ICU Level of Service											
	A											



HCM Unsignalized Intersection Capacity Analysis  
 16: Tubman Avenue/Street 'J' & Oak Street

HCM Unsignalized Intersection Capacity Analysis  
 18: River Street & Oak Street

2032 Future Total PM Model  
 04-04-2023

2032 Future Total PM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	135	10	0	0	0	0	0	0	15	25	0
Future Volume (Veh/h)	0	135	10	0	0	0	0	0	0	15	25	0
Sign Control		Free		Free			Stop			Stop		
Grade		0%		0%			0%			0%		
Peak Hour Factor	0.93	0.93	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	145	11	0	0	0	0	0	0	16	27	0
Pedestrians		20		5			30					
Lane Width (m)		3.5		0.0			0.0					
Walking Speed (m/s)		1.1		1.1			1.1					
Percent Blockage		2		0			0					
Right turn flare (veh)												
Median type		None		None			None					
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked												
VC, conflicting volume	0			186			214			186		20
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	0			186			214			186		20
IC, single (s)	4.1			4.1			7.1			6.2		6.2
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5			3.5		3.3
p0 queue free %	100			100			100			100		96
pM capacity (veh/h)	1636			1401			713			862		712
Direction, Lane #	EB 1	SB 1										
Volumes Total	156	43										
Volume Left	0	16										
Volume Right	11	0										
cSH	1700	747										
Volumes to Capacity	0.09	0.06										
Queue Length 95th (m)	0.0	1.4										
Control Delay (s)	0.0	10.1										
Lane LOS		B										
Approach Delay (s)	0.0	10.1										
Approach LOS		B										
Intersection Summary												
Average Delay		2.2										A
Intersection Capacity Utilization		29.0%										
Analysis Period (min)		15										

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	5	55	20	0	50	0	460	40	50	570	0
Future Volume (Veh/h)	90	5	55	20	0	50	0	460	40	50	570	0
Sign Control		Stop		Stop			Free			Free		
Grade		0%		0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	5	60	22	0	54	0	500	43	54	620	0
Pedestrians		75		45			50					5
Lane Width (m)		3.5		3.5			3.5					3.5
Walking Speed (m/s)		1.1		1.1			1.1					1.1
Percent Blockage		7		4			4					0
Right turn flare (veh)												
Median type		None		None			None					
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked	0.87	0.87	0.80	0.87	0.87	0.85	0.80			0.85		151
VC, conflicting volume	1384	1391	745	1407	1370	572	695			588		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	984	993	552	1011	968	410	489			430		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	33	97	84	83	100	90	100			94		
pM capacity (veh/h)	147	182	375	127	188	526	806			933		
Direction, Lane #	EB 1	WB 1	NB 1				SB 1					
Volumes Total	163	76	543	674								
Volume Left	98	22	0	54								
Volume Right	60	54	43	0								
cSH	191	276	1700	933								
Volumes to Capacity	0.86	0.28	0.32	0.06								
Queue Length 95th (m)	47.8	8.3	0.0	1.4								
Control Delay (s)	82.6	22.9	0.0	1.5								
Lane LOS	F	C		A								
Approach Delay (s)	82.6	22.9	0.0	1.5								
Approach LOS	F	C		C								
Intersection Summary												
Average Delay				11.1								E
Intersection Capacity Utilization				86.4%								
Analysis Period (min)				15								

19: Parliament Street & Cole Street

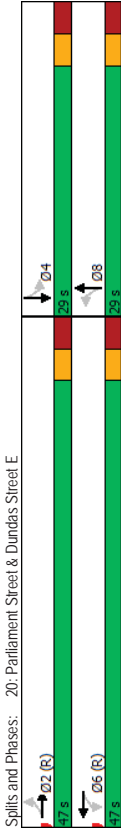
2032 Future Total PM Model  
04-04-2023

20: Parliament Street & Dundas Street E

2032 Future Total PM Model  
04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			←	←	←	←
Traffic Volume (veh/h)	0	0	565	20	25	405
Future Volume (Veh/h)	0	0	565	20	25	405
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	673	24	30	482
Pedestrians	255	0	25	0	15	0
Lane Width (m)	0.0	0.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	2	2	1	1
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)			80	80	214	214
pX platoon unblocked	0.88	0.88	618	618	952	952
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1034	300			678	
IC, single (s)	6.8	6.9			4.1	
IC, 2 stage (s)						
p0 queue free %	3.5	3.3			2.2	
IC capacity (veh/h)	192	611			814	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	449	248	191	321		
Volume Left	0	0	30	0		
Volume Right	0	24	0	0		
cSH	1700	1700	814	1700		
Volumes to Capacity	0.26	0.15	0.04	0.19		
Queue Length 95th (m)	0.0	0.0	0.9	0.0		
Control Delay (s)	0.0	0.0	1.8	0.0		
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.7			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			43.9%			
Analysis Period (min)			15			
ICU Level of Service			A			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	←	←	←	←	←	←	←
Traffic Volume (vph)	80	490	55	190	45	435	45	335
Future Volume (vph)	80	490	55	190	45	435	45	335
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4	
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
70% Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	29.0	29.0
Total Split (%)	61.8%	61.8%	61.8%	61.8%	38.2%	38.2%	38.2%	38.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)			5.0		5.0		5.0	
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.0	41.0	C-Min	C-Min	Min	Min	Min	Min
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.33	0.33	0.33	0.33
v/C Ratio	0.48	0.48	0.28	0.28	0.62	0.62	0.53	0.53
Control Delay	12.1	13.4	13.4	24.1	22.5	22.5	22.5	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	13.4	13.4	24.1	22.5	22.5	22.5	22.5
LOS	B	B	B	C	C	C	C	C
Approach Delay								
Approach LOS								
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 9 (12%) Referenced to phase 2:EBTL and 6:WBTL Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/C Ratio: 0.62								
Intersection Signal Delay: 17.9								
Intersection Capacity Utilization 93.3%								
Analysis Period (min) 15								



	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	708	354	591	455
v/c Ratio	0.48	0.28	0.62	0.53
Control Delay	12.1	13.4	24.1	22.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.1	13.4	24.1	22.5
Queue Length 50th (m)	28.5	10.4	37.0	27.5
Queue Length 95th (m)	46.5	29.2	48.0	37.1
Internal Link Dist (m)	85.0	103.5	45.0	56.1
Turn Bay Length (m)				
Base Capacity (vph)	1514	1295	950	866
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	0.47	0.27	0.62	0.53
<b>Intersection Summary</b>				

	→	←	↑	↓
Movement	EBL	EBT	EBR	WBL
Lane Configurations	80	490	60	55
Traffic Volume (vph)	80	490	60	55
Future Volume (vph)	80	490	60	55
Ideal Flow (vphpl)	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0
Total Lost time (s)	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.95	0.95
Frbp. ped/bikes	0.98	0.98	0.98	0.98
Frbp. psd/bikes	0.98	0.98	0.98	0.98
Frt	0.99	0.99	0.99	0.99
Flt Protected	0.99	0.99	0.99	0.99
Satd. Flow (prot)	3195	3010	3270	3203
Flt Permitted	0.85	0.77	0.87	0.81
Satd. Flow (perm)	2721	2330	2859	2610
Peak-hour factor, PHF	0.89	0.89	0.89	0.89
Adj. Flow (vph)	90	551	67	62
RTOR Reduction (vph)	0	11	0	0
Lane Group Flow (vph)	0	697	0	346
Confl. Peds. (#/hr)	260	155	155	260
Confl. Bikes (#/hr)	25	25	20	20
Heavy Vehicles (%)	3%	6%	5%	6%
Parking (#/hr)	0	0	0	0
Turn Type	Perm	NA	NA	Perm
Protected Phases	2	2	6	6
Permitted Phases	2	2	6	6
Actuated Green, G (s)	40.0	40.0	40.0	24.0
Effective Green, g (s)	41.0	41.0	25.0	25.0
Actuated g/C Ratio	0.54	0.54	0.33	0.33
Clearance Time (s)	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1467	1256	940	858
v/s Ratio Prot	c0.26	0.15	c0.20	0.17
v/c Ratio	0.48	0.28	0.62	0.52
Uniform Delay, d1	10.8	9.5	21.5	20.7
Progression Factor	1.00	1.35	1.00	1.00
Incremental Delay, d2	1.1	0.5	1.2	0.6
Delay (s)	11.9	13.4	22.7	21.2
Level of Service	B	B	C	C
Approach Delay (s)	11.9	13.4	22.7	21.2
Approach LOS	B	B	C	C
<b>Intersection Summary</b>				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.53	B		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)		
Intersection Capacity Utilization	93.3%	10.0		
Analysis Period (min)	15	F		
c Critical Lane Group				

21: Regent Street & Dundas Street E

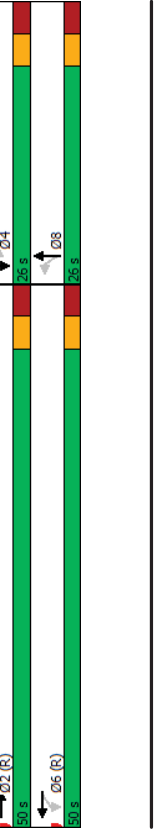
22: Sackville Street & Dundas Street E

2032 Future Total PM Model  
04-04-2023

2032 Future Total PM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	40	510	15	5	305	25	5	10	5	5	5	25
Traffic Volume (veh/h)	40	510	15	5	305	25	5	10	5	5	5	25
Future Volume (Veh/h)	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Sign Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Grade	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak Hour Factor	43	548	16	5	328	27	5	11	5	5	5	27
Hourly flow rate (vph)	30	35	3.5	3.5	3.5	3.5	125	125	125	135	135	135
Pedestrians	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Lane Width (m)	3	3	3	3	3	3	3	3	3	3	3	3
Walking Speed (m/s)	None	None	None	None	None	None	None	None	None	None	None	None
Percent Blockage	127	127	124	124	124	124	124	124	124	124	124	124
Right turn flare (veh)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Median type	1000	1000	1267	417	867	1262	342	342	342	342	342	342
Median storage (veh)	490	490	490	490	490	490	490	490	490	490	490	490
Upstream signal (m)	490	490	490	490	490	490	490	490	490	490	490	490
pX platoon unblocked	4.1	4.1	4.4	4.4	4.4	4.4	7.5	6.5	7.9	7.5	6.5	6.9
VC, conflicting volume	2.2	2.2	2.4	2.4	2.4	2.4	3.5	4.0	3.8	3.5	4.0	3.3
VC1, stage 1 conf vol	95	95	99	99	99	99	97	92	99	97	96	95
VC2, stage 2 conf vol	954	954	767	767	767	767	145	136	492	186	137	565
IC, single (s)	Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2			
IC, 2 stage (s)	Volume Total	317	290	169	191	21	37					
p0 queue free %	Volume Left	43	0	5	0	5	5					
CM capacity (veh/h)	Volume Right	0	16	0	27	5	27					
	cSH	954	1700	767	1700	167	333					
	Volumes to Capacity	0.05	0.17	0.01	0.11	0.13	0.11					
	Queue Length 95th (m)	1.1	0.0	0.1	0.0	3.2	2.8					
	Control Delay (s)	1.6	0.0	0.4	0.0	29.6	17.2					
	Lane LOS	A	A	A	D	C	C					
	Approach Delay (s)	0.9	0.2	29.6	17.2							
	Approach LOS	D	D	C	C							
	Intersection Summary											
	Average Delay	1.8										
	Intersection Capacity Utilization	49.2%										A
	Analysis Period (min)	15										

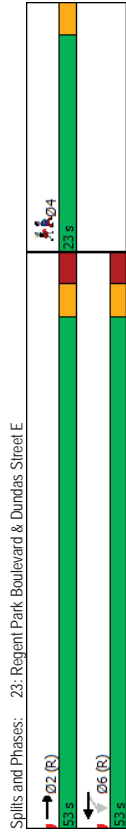
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4
Traffic Volume (vph)	500	15	250	40	0	35	35
Future Volume (vph)	500	15	250	40	0	35	35
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	6	6	8	8	4	4
Permitted Phases	2	6	6	6	8	8	4
Detector Phase	2	6	6	6	8	8	4
Switch Phase	17.0	17.0	17.0	17.0	7.0	7.0	7.0
Minimum Initial (s)	24.0	24.0	24.0	24.0	26.0	26.0	26.0
Minimum Split (s)	50.0	50.0	50.0	50.0	26.0	26.0	26.0
Total Split (s)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Total Split (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Yellow Time (s)	All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Lost Time Adjust (s)	Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lead-Lag Optimize?						
Lead-Lag Optimize?	Recall Mode	C-Min	C-Min	C-Min	None	None	None
Recall Mode	Ad Effct Green (s)	47.6	47.6	18.4	18.4	18.4	18.4
Ad Effct Green (s)	Actuated g/C Ratio	0.63	0.63	0.24	0.24	0.24	0.24
Actuated g/C Ratio	v/C Ratio	0.28	0.27	0.23	0.23	0.32	0.32
v/C Ratio	Control Delay	5.8	7.1	13.2	17.5	17.5	17.5
Control Delay	Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Queue Delay	Total Delay	5.8	7.3	13.2	17.5	17.5	17.5
Total Delay	LOS	A	A	B	B	B	B
LOS	Approach Delay	5.8	7.3	13.2	17.5	17.5	17.5
Approach Delay	Approach LOS	A	A	B	B	B	B
Approach LOS	Intersection Summary						
Intersection Summary	Cycle Length: 76						
Cycle Length: 76	Actuated Cycle Length: 76						
Actuated Cycle Length: 76	Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green						
Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green	Natural Cycle: 50						
Natural Cycle: 50	Control Type: Actuated-Coordinated						
Control Type: Actuated-Coordinated	Maximum v/C Ratio: 0.32						
Maximum v/C Ratio: 0.32	Intersection Signal Delay: 8.1						
Intersection Signal Delay: 8.1	Intersection Capacity Utilization 49.7%						
Intersection Capacity Utilization 49.7%	Analysis Period (min) 15						
Analysis Period (min) 15							



	EBT	WBT	NBT	SBT
Lane Group	570	285	75	124
Lane Group Flow (vph)	0.28	0.27	0.23	0.32
v/c Ratio	5.8	7.1	13.2	17.5
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	5.8	7.3	13.2	17.5
Total Delay	13.0	18.1	3.4	9.1
Queue Length 50th (m)	21.3	22.5	12.9	21.9
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2062	1062	367	430
Station Cap Reductn	0	319	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.38	0.20	0.29
<b>Intersection Summary</b>				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4	4					4			4		
Traffic Volume (vph)	0	500	30	15	250	0	40	0	30	35	35	45	
Future Volume (vph)	0	500	30	15	250	0	40	0	30	35	35	45	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5	
Total Lost time (s)	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			1.00			1.00			1.00		
Frbp. ped/bikes		0.98			1.00			0.95			0.96		
Frbp. ped/bikes		1.00			0.99			0.96			0.97		
Frt		0.99			1.00			0.94			0.95		
Flt Protected		1.00			1.00			0.97			0.98		
Satd. Flow (prot)		3291			1756			1496			1601		
Flt Permitted		1.00			0.96			0.79			0.89		
Satd. Flow (perm)		3291			1695			1217			1450		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	538	32	16	269	0	43	0	32	38	38	48	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	570	0	0	285	0	0	42	0	0	93	0	
Conf. Peds. (#/hr)	105	175	175	175	105	70	70	55	55	55	70	5	
Conf. Bikes (#/hr)													
Heavy Vehicles (%)	0%	5%	6%	0%	6%	0%	0%	0%	12%	0%	2%	5%	
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Protected Phases	2			6			8				4		
Permitted Phases		6					8				4		
Actuated Green, G (s)	46.6			46.6			17.4				17.4		
Effective Green, g (s)	47.6			47.6			18.4				18.4		
Actuated g/C Ratio	0.63			0.63			0.24				0.24		
Clearance Time (s)	6.0			6.0			6.0				6.0		
Vehicle Extension (s)	3.0			3.0			3.0				3.0		
Lane Grp Cap (vph)	2061			1061			294				351		
v/s Ratio Prot	c0.17												
v/s Ratio Perm		0.17					0.03				0.06		
v/c Ratio	0.28			0.27			0.14				0.26		
Uniform Delay, d1	6.4			6.4			22.6				23.3		
Progression Factor	0.76			0.87			1.00				1.00		
Incremental Delay, d2	0.3			0.6			0.2				0.4		
Delay (s)	5.2			6.2			22.8				23.7		
Level of Service	A			A			C				C		
Approach Delay (s)	5.2			6.2			22.8				23.7		
Approach LOS	A			A			C				C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	8.9											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.7%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	535	15	265	4
Future Volume (vph)	535	15	265	4
Turn Type	NA	Perm	NA	NA
Protected Phases	2	6	6	4
Permitted Phases	2	6	6	6
Detector Phase				
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.43	0.22	0.22	
Control Delay	3.4	4.1	4.1	
Queue Delay	0.0	0.0	0.0	
Total Delay	3.4	4.1	4.1	
LOS	A	A	A	
Approach Delay	3.4	4.1	4.1	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 22 (29%), Referenced to phase 2EBT and 6WBT, Start of 1st Green				
Natural Cycle: 60				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.43				
Intersection Signal Delay: 3.6				
Intersection Capacity Utilization 50.0%				
ICU Level of Service A				
Analysis Period (min) 15				



Lane Group	EBT	WBT
Lane Group Flow (vph)	635	315
v/c Ratio	0.43	0.22
Control Delay	3.4	4.1
Queue Delay	0.0	0.0
Total Delay	3.4	4.1
Queue Length 50th (m)	0.8	0.0
Queue Length 95th (m)	62.7	29.1
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1462	1449
Starvation Cap Reductn	43	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.45	0.22
<b>Intersection Summary</b>		



23: Regent Park Boulevard & Dundas Street E

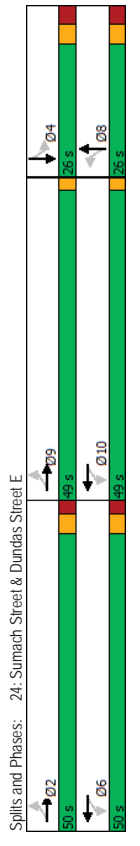
2032 Future Total PM Model  
04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4	4	4	4	4	4
Traffic Volume (vph)	535	30	15	265	0	0
Future Volume (vph)	535	30	15	265	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.97		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	0.99		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1712		1756			
Flt Permitted	1.00		0.96			
Sat'd Flow (perm)	1712		1696			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	601	34	17	298	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	634	0	0	315	0	0
Conf. Peds. (#/hr)	235	235	0	60	65	0
Heavy Vehicles (%)	6%	6%	0%	6%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases	6		6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1353		1341			
v/s Ratio Prot	0.37		0.19			
v/s Ratio Perm	0.47		0.23			
Uniform Delay, d1	2.6		2.0			
Progression Factor	0.51		1.00			
Incremental Delay, d2	1.1		0.4			
Delay (s)	2.5		2.5			
Level of Service	A		A			
Approach Delay (s)	2.5		2.5	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.5 HCM 2000 Level of Service A					
HCM 2000 Volume to Capacity ratio	0.41					
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 7.9					
Intersection Capacity Utilization	50.0% ICU Level of Service A					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

2032 Future Total PM Model  
04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4	4
Traffic Volume (vph)	50	465	30	250	25	90	25	10
Future Volume (vph)	50	465	30	250	25	90	25	10
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Permitted Phases	2,9		6,10		8		4	
Detector Phase	2		6		8		4	
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0		-1.0		-1.0		-1.0	
Total Lost Time (s)	5.0		5.0		5.0		5.0	
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode	63.7		63.7		22.8		22.8	
Act Effct Green (s)	0.66		0.66		0.24		0.24	
Actuated g/C Ratio	0.56		0.49		0.48		0.13	
v/C Ratio	9.5		7.6		41.4		35.2	
Queue Delay	2.4		0.0		0.0		0.0	
Total Delay	11.9		7.6		41.4		35.2	
LOS	B		A		D		D	
Approach Delay	11.9		7.6		41.4		35.2	
Approach LOS	B		A		D		D	
Intersection Summary								
Cycle Length: 125								
Actuated Cycle Length: %3								
Natural Cycle: 100								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.56								
Intersection Signal Delay: 15.3								
Intersection Capacity Utilization 64.2%								
Analysis Period (min) 15								



	EBT	WBT	NBT	SBT
Lane Group	576	446	172	43
Lane Group Flow (vph)	0.56	0.49	0.48	0.13
v/c Ratio	9.5	7.6	41.4	35.2
Control Delay	2.4	0.0	0.0	0.0
Queue Delay	11.9	7.6	41.4	35.2
Total Delay	45.8	28.3	29.0	6.4
Queue Length 50th (m)	66.4	44.5	56.6	17.6
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)	1174	1027	360	320
Base Capacity (vph)	450	0	0	0
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.43	0.48	0.13
<b>Intersection Summary</b>				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4		4				4			4		
Traffic Volume (vph)	50	465	20	30	250	135	25	90	45	25	10	5	
Future Volume (vph)	50	465	20	30	250	135	25	90	45	25	10	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	4.0	4.0		4.0				4.0			4.0		
Lane Util. Factor	1.00	1.00		1.00				1.00			1.00		
Frbp. ped/bikes	0.98	0.90		0.90				0.96			0.97		
Frbp. ped/bikes	0.99	0.99		0.99				0.96			0.95		
Frt	0.99	0.96		0.96				0.96			0.97		
Flt Protected	1.00	1.00		1.00				0.99			0.97		
Sat'd. Flow (prot)	1688	1478		1478				1580			1615		
Flt Permitted	0.93	0.94		0.94				0.95			0.82		
Sat'd. Flow (perm)	1573	1397		1397				1516			1359		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	54	500	22	32	269	145	27	97	48	27	11	5	
RTOR Reduction (vph)	0	1	0	0	17	0	0	10	0	0	4	0	
Lane Group Flow (vph)	0	575	0	0	429	0	0	162	0	0	39	0	
Confl. Peds. (#/hr)	100	185	185	100	105	100	105	50	50	50	105	105	
Confl. Bikes (#/hr)		25			20								
Heavy Vehicles (%)	12%	6%	8%	0%	9%	5%	4%	5%	6%	0%	9%	0%	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	2.9			6.10			8				4		
Permitted Phases	2.9			6.10			8				4		
Actuated Green, G (s)	66.2			66.2			21.7				21.7		
Effective Green, g (s)	67.2			67.2			22.7				22.7		
Actuated g/C Ratio	0.70			0.70			0.24				0.24		
Clearance Time (s)							6.0				6.0		
Vehicle Extension (s)							3.0				3.0		
Lane Grp Cap (vph)	1102			978			358				321		
v/s Ratio Prot													
v/s Ratio Perm	60.37			0.31			60.11				0.03		
v/c Ratio	0.52			0.44			0.45				0.12		
Uniform Delay, d1	6.8			6.2			31.3				28.8		
Progression Factor	1.00			1.00			1.00				1.00		
Incremental Delay, d2	0.4			0.3			0.9				0.2		
Delay (s)	7.2			6.5			32.2				28.9		
Level of Service	A			A			C				C		
Approach Delay (s)	7.2			6.5			32.2				28.9		
Approach LOS	A			A			C				C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	11.2											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52												
Actuated Cycle Length (s)	95.9											Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.2%											ICU Level of Service	C
Analysis Period (min)	15												
c Critical Lane Group													

25: Tubman Avenue & Dundas Street E

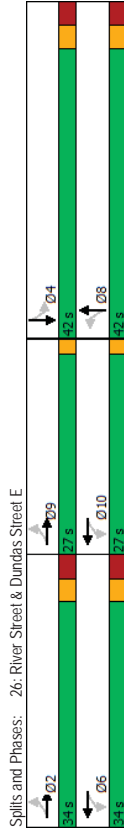
2032 Future Total PM Model  
04-04-2023

26: River Street & Dundas Street E

2032 Future Total PM Model  
04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	0	525	10	10	400	0	0	0	0	0	20	0
Traffic Volume (veh/h)	0	525	10	10	400	0	0	0	0	20	0	15
Future Volume (Veh/h)	0	525	10	10	400	0	0	0	0	20	0	15
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	0	553	11	11	421	0	0	0	0	21	0	16
Pedestrians	10					10	130			21	50	
Lane Width (m)	3.5					3.5	0.0			3.5		
Walking Speed (m/s)	1.1					1.1	1.1			1.1		
Percent Blockage	1					1	0			4		
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (m)	99					98						
pX platoon unblocked							0.86	0.86	0.86	0.86	0.86	0.86
VC, conflicting volume	471					694	1158	1182	698	1062	1187	481
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	471					568	1104	1132	573	993	1138	481
IC, single (s)	4.1					4.1	7.1	6.5	6.2	7.1	6.5	6.2
IC, 2 stage (s)												
IF (s)	2.2					2.2	3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100					99	100	100	100	88	100	97
CM capacity (veh/h)	1053					877	152	167	448	177	166	558
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	564	432	37									
Volume Left	0	11	21									
Volume Right	11	0	16									
cSH	1053	877	252									
Volume to Capacity	0.00	0.01	0.15									
Queue Length 95th (m)	0.0	0.3	3.9									
Control Delay (s)	0.0	0.4	21.8									
Lane LOS	A	A	C									
Approach Delay (s)	0.0	0.4	21.8									
Approach LOS	C	C	C									
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			46.1%							A		
Analysis Period (min)			15									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Configurations	4	4	4	4	4	4	4	4					
Traffic Volume (vph)	25	450	95	245	65	375	105	445					
Future Volume (vph)	25	450	95	245	65	375	105	445					
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA					
Protected Phases	2.9		6.10		8		8						
Permitted Phases	2	2	6	6	8	8	4	4					
Detector Phase													
Switch Phase													
Minimum Initial (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	42.0	42.0	42.0	42.0	42.0	42.0	34.0	34.0	34.0	34.0	34.0	27.0	27.0
Total Split (%)	40.8%	40.8%	40.8%	40.8%	40.8%	40.8%	33%	33%	33%	33%	33%	26%	26%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0
Lead-Lag													
Lead-Lag Optimize?													
Recall Mode													
Act Effct Green (s)	32.1	32.1	37.7	37.7	37.7	37.7	37.7	37.7					
Actuated g/C Ratio	0.40	0.40	0.47	0.47	0.47	0.47	0.47	0.47					
v/C Ratio	0.85	0.94	0.32	0.80	0.61	0.75	0.75	0.75					
Control Delay	34.2	50.2	23.0	29.3	37.6	27.5	27.5	27.5					
Queue Delay	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay	35.0	50.2	23.0	29.3	37.6	27.5	27.5	27.5					
LOS	C	D	C	C	C	D	C	C					
Approach Delay	35.0	50.2	28.7	29.2	29.2	29.2	29.2	29.2					
Approach LOS	C	D	C	C	C	C	C	C					
Intersection Summary													
Cycle Length	103												
Actuated Cycle Length	80												
Natural Cycle	95												
Control Type	Actuated-Uncoordinated												
Maximum v/C Ratio	0.94												
Intersection Signal Delay	34.5												
Intersection Capacity Utilization	124.7%												
Analysis Period (min)	15												



Queues 2032 Future Total PM Model  
26: River Street & Dundas Street E

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	574	474	68	621	111	573
Lane Group Flow (vph)	0.85	0.94	0.32	0.80	0.61	0.75
v/c Ratio	34.2	50.2	23.0	29.3	37.6	27.5
Control Delay	0.8	0.0	0.0	0.0	0.0	0.0
Queue Delay	35.0	50.2	23.0	29.3	37.6	27.5
Total Delay	74.4	63.1	5.6	66.3	10.8	60.7
Queue Length 50th (m)	110.0	103.2	24.0	#197.1	#51.1	#180.7
Queue Length 95th (m)	73.4	80.5		131.0		118.9
Internal Link Dist (m)			20.0		25.0	
Turn Bay Length (m)						
Base Capacity (vph)	706	528	211	775	183	762
Station Cap Reductn	24	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.90	0.32	0.80	0.61	0.75

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2032 Future Total PM Model  
26: River Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	25	450	70	95	245	110	65	375	215	105	445	100	
Future Volume (vph)	25	450	70	95	245	110	65	375	215	105	445	100	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	5.0					5.0	5.0			5.0		5.0	
Lane Util. Factor	1.00					1.00	1.00			1.00		1.00	
Frbp. ped/bikes	0.98					0.97	1.00	0.94		1.00	0.97		
Frbp. psd/bikes	1.00					0.99	0.96	1.00		0.96	1.00		
Frt	0.98					0.97	1.00	0.95		1.00	0.97		
Frt Protected	1.00					0.99	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1718					1637	1538	1636		1594	1614		
Flt Permitted	0.97					0.74	0.26	1.00		0.22	1.00		
Satd. Flow (perm)	1666					1231	429	1636		375	1614		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	26	474	74	100	258	116	68	395	226	111	468	105	
RTOR Reduction (vph)	0	6	0	0	13	0	0	17	0	0	6	0	
Lane Group Flow (vph)	0	568	0	0	461	0	68	604	0	111	567	0	
Confl. Peds. (#/hr)	55	75	75	75	75	55	75	75	75	75	75	5	
Confl. Bikes (#/hr)			25			20			10				
Heavy Vehicles (%)	9%	5%	0%	1%	9%	0%	5%	3%	0%	2%	12%	0%	
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA	
Protected Phases	2.9			6.10				8				4	
Permitted Phases	2.9			6.10				8				4	
Actuated Green, G (s)	36.8			36.8				36.7			36.7	36.7	
Effective Green, g (s)	37.8			37.8				37.7			37.7	37.7	
Actuated g/C Ratio	0.46			0.46				0.46			0.46	0.46	
Clearance Time (s)								6.0			6.0	6.0	
Vehicle Extension (s)								3.0			3.0	3.0	
Lane Grp Cap (vph)	772			570			198	756			173	746	
v/s Ratio Prot				c0.37				c0.37				0.35	
v/s Ratio Perm	0.34			c0.37			0.16				0.30		
v/c Ratio	0.74			0.81			0.34	0.80			0.64	0.76	
Uniform Delay, d1	17.8			18.7			14.0	18.7			16.7	18.1	
Progression Factor	1.00			1.00			1.00	1.00			1.00	1.00	
Incremental Delay, d2	3.7			8.3			1.0	5.9			7.9	4.5	
Delay (s)	21.5			27.0			15.0	24.6			24.6	22.6	
Level of Service	C			C			B	C			C	C	
Approach Delay (s)	21.5			27.0			23.7				22.9		
Approach LOS	C			C			C				C	C	
Intersection Summary													
HCM 2000 Control Delay	23.6											HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84												
Actuated Cycle Length (s)	81.5											Sum of lost time (s)	11.0
Intersection Capacity Utilization	124.7%											ICU Level of Service	H
Analysis Period (min)	15												
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis  
 27: Dreamer's Way & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
 28: Dreamer's Way & Site Driveway

2032 Future Total PM Model  
 04-04-2023

2032 Future Total PM Model  
 04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (veh/h)	920	70	15	445	0	0
Future Volume (Veh/h)	920	70	15	445	0	0
Sign Control	Free	Free	Free	Stop	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	968	74	16	468	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)						
Upstream signal (m)	90			162		
PX platoon unblocked		0.86		0.86	0.86	
VC, conflicting volume	1042			1271	521	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	717			984	110	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)	2.2			3.5	3.3	
p0 queue free %	98			100	100	
CM capacity (veh/h)	766			209	797	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volumes Total	645	397	172	312		
Volume Left	0	0	16	0		
Volume Right	0	74	0	0		
cSH	1700	1700	766	1700		
Volumes to Capacity	0.38	0.23	0.02	0.18		
Queue Length 95th (m)	0.0	0.0	0.5	0.0		
Control Delay (s)	0.0	0.0	1.1	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0		0.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization		31.0%				A
Analysis Period (min)		15				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑					↑
Traffic Volume (veh/h)	10	0	0	0	20	65
Future Volume (Veh/h)	10	0	0	0	20	65
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	0	0	21	68
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		None
Median type						
Median storage (veh)						
Upstream signal (m)						
PX platoon unblocked						
VC, conflicting volume	110			0	0	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	110			0	0	
IC, single (s)	6.4			6.2	4.1	
IC, 2 stage (s)	3.5			3.3	2.2	
p0 queue free %	99			100	99	
CM capacity (veh/h)	880			1091	1636	
Direction, Lane #	WB 1			SB 1		
Volumes Total	11			89		
Volume Left	11			21		
Volume Right	0			0		
cSH	880			1636		
Volumes to Capacity	0.01			0.01		
Queue Length 95th (m)	0.3			0.3		
Control Delay (s)	9.1			1.8		
Lane LOS	A			A		
Approach Delay (s)	9.1			1.8		
Approach LOS	A			A		
Intersection Summary						
Average Delay				2.6		
Intersection Capacity Utilization				14.5%		A
Analysis Period (min)				15		

HCM Unsignalized Intersection Capacity Analysis  
 29: Sumach Street & Site Driveway

HCM Unsignalized Intersection Capacity Analysis  
 30: Street 'J' & Site Laneway

04-04-2023

2032 Future Total PM Model  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	0	0	0	35	20	145	60	0	0	0
Future Volume (Veh/h)	10	0	0	0	0	35	20	145	60	0	0	0
Sign Control	Stop	0%	0%	Stop	0%	Free	0%	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	11	0	0	0	0	37	21	153	63	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (m)												55
pX platoon unblocked												
VC, conflicting volume	264	258	0	226	226	184	0	216				
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	264	258	0	226	226	184	0	216				
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	98	100	100	100	100	96	99	100				
CM capacity (veh/h)	657	641	1091	726	688	863	1636	1366				
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	11	37	237									
Volume Left	11	0	21									
Volume Right	0	37	63									
cSH	657	863	1636									
Volumes to Capacity	0.02	0.04	0.01									
Queue Length 95th (m)	0.4	1.0	0.3									
Control Delay (s)	10.6	9.4	0.7									
Lane LOS	B	A	A									
Approach Delay (s)	10.6	9.4	0.7									
Approach LOS	B	A	A									
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			26.3%									A
Analysis Period (min)			15									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	0	45	20
Future Volume (Veh/h)	20	0	0	0	45	20
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	0	0	0	47	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	115	0	0	0	0	0
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	115	0	0	0	0	0
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			97	
CM capacity (veh/h)	861	1091			1636	
Direction, Lane #	WB 1	SB 1				
Volume Total	21	68				
Volume Left	21	47				
Volume Right	0	0				
cSH	861	1636				
Volumes to Capacity	0.02	0.03				
Queue Length 95th (m)	0.6	0.7				
Control Delay (s)	9.3	5.1				
Lane LOS	A	A				
Approach Delay (s)	9.3	5.1				
Approach LOS	A	A				
Intersection Summary						
Average Delay			6.1			
Intersection Capacity Utilization			13.5%			
Analysis Period (min)			15			
						A



HCM Unsignalized Intersection Capacity Analysis  
31: Street 'G' & Gerrard Street E

HCM Unsignalized Intersection Capacity Analysis  
32: Oak Street & Street 'G'

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔↔	↔↔	↔	↔
Traffic Volume (veh/h)	1040	0	0	585	0	10
Future Volume (Veh/h)	1040	0	0	585	0	10
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1095	0	0	616	0	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			None			
Median type			None			
Median storage (veh)						
Upstream signal (m)	171			81		
PX platoon unblocked		0.89		0.92		0.89
VC conflicting volume		1095		1403		548
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol		850		919		232
IC single (s)		4.1		6.8		6.9
IC 2 stage (s)						
p0 queue free %		2.2		3.5		3.3
IF (s)		100		100		98
CM capacity (veh/h)		706		253		688
Direction_Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volumes Total	548	548	308	308	11	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	11	
cSH	1700	1700	1700	1700	688	
Volumes to Capacity	0.32	0.32	0.18	0.18	0.02	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.4	
Control Delay (s)	0.0	0.0	0.0	0.0	10.3	
Lane LOS					B	
Approach Delay (s)	0.0	0.0	0.0	10.3		
Approach LOS				B		
Intersection Summary						
Average Delay						0.1
Intersection Capacity Utilization						38.7%
ICU Level of Service						A
Analysis Period (min)						15

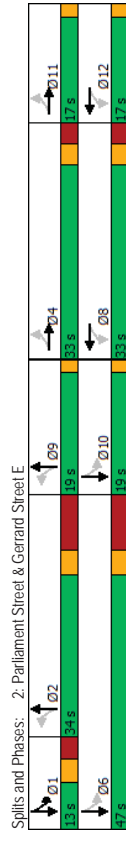
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	10	100	55	0	0	0
Future Volume (Veh/h)	10	100	55	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	105	58	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			None			
Median type			None			
Median storage (veh)						
Upstream signal (m)						
PX platoon unblocked						
VC conflicting volume		58				185
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol		58				58
IC single (s)		4.1				6.4
IC 2 stage (s)						
p0 queue free %		2.2				3.5
IF (s)		99				100
CM capacity (veh/h)		1559				803
Direction_Lane #	EB 1	WB 1				
Volumes Total	116	58				
Volume Left	11	0				
Volume Right	0	0				
cSH	1559	1700				
Volumes to Capacity	0.01	0.03				
Queue Length 95th (m)	0.2	0.0				
Control Delay (s)	0.7	0.0				
Lane LOS	A					
Approach Delay (s)	0.7	0.0				
Approach LOS						
Intersection Summary						
Average Delay						0.5
Intersection Capacity Utilization						15.8%
ICU Level of Service						A
Analysis Period (min)						15

04-04-2023  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4A	4A	
Traffic Volume (veh/h)	0	0	5	570	490	60
Future Volume (Veh/h)	0	0	5	570	490	60
Sign Control	Stop					
Grade	0%					
Peak Hour Factor	0.92					
Hourly flow rate (vph)	0	0	5	620	533	65
Pedestrians	80					
Lane Width (m)	3.5					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	39					
pX platoon unblocked	0.93					
VC, conflicting volume	970	379	678			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	812	379	678			
IC, single (s)	6.8	6.9	4.5			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.4			
IF (s)	100	100	99			
CM capacity (veh/h)	294	625	799			
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	212	413	355	243		
Volume Left	5	0	0	0		
Volume Right	0	0	0	65		
cSH	799	1700	1700	1700		
Volumes to Capacity	0.01	0.24	0.21	0.14		
Queue Length 95th (m)	0.1	0.0	0.0	0.0		
Control Delay (s)	0.3	0.0	0.0	0.0		
Lane LOS	A					
Approach Delay (s)	0.1					
Approach LOS	A					
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	22.6%					
Analysis Period (min)	15					
ICU Level of Service	A					

04-04-2023  
 2032 Future Total AM Model (Sensitivity)  
 2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø4	Ø6	Ø8
Lane Configurations		4TB		4TB		4TB		4TB				
Traffic Volume (vph)	25	250	65	560	110	345	80	340				
Future Volume (vph)	25	250	65	560	110	345	80	340				
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA				
Protected Phases	4 11 8 12 2 9 1 1 6 10 2 4 6 8											
Permitted Phases	4 4 4 8 8 8 2 2 2 1 1 6											
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0											
Minimum Split (s)	12.5											
Total Split (s)	13.0											
Total Split (%)	11.2%											
Yellow Time (s)	3.3											
All-Red Time (s)	3.2											
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lag											
Lead	Yes											
Lag	Yes											
Recall Mode	None											
Ad Effct Green (s)	33.5	33.5	33.5	30.4	48.8							
Actuated g/C Ratio	0.36	0.36	0.83	0.70	0.37							
w/C Ratio	0.35	0.83	0.70	0.37								
Control Delay	21.1	34.4	32.6	13.5								
Queue Delay	0.0	0.0	0.0	0.0								
Total Delay	21.1	34.4	32.6	13.5								
LOS	C											
Approach Delay	21.1	34.4	32.6	13.5								
Approach LOS	C											
Intersection Summary												
Cycle Length	116											
Actuated Cycle Length	93											
Natural Cycle	115											
Control Type	Actuated-Uncoordinated											
Maximum w/C Ratio	0.83											
Intersection Signal Delay	27.1											
Intersection Capacity Utilization	100.8%											
Analysis Period (min)	15											



Timings  
2: Parliament Street & Gerrard Street E

2032 Future Total AM Model (Sensitivity)  
04-04-2023  
Queues  
2: Parliament Street & Gerrard Street E

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	19.0	19.0	17.0	17.0
Total Split (s)	19.0	19.0	17.0	17.0
Total Split (%)	16%	16%	15%	15%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

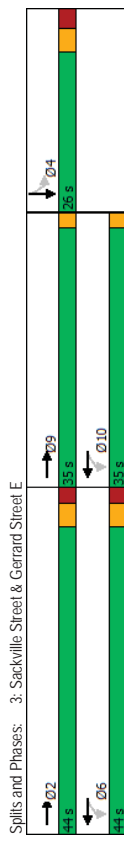
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	368	873	526	516
v/c Ratio	0.35	0.83	0.70	0.37
Control Delay	21.1	34.4	32.6	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.1	34.4	32.6	13.5
Queue Length 50th (m)	19.2	60.6	37.2	20.9
Queue Length 95th (m)	39.3	111.3	68.3	43.1
Internal Link Dist (m)	33.0	63.9	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1042	1076	765	1418
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	0.35	0.81	0.69	0.36
Intersection Summary				

2. Parliament Street & Gerrard Street E 2032 Future Total AM Model (Sensitivity) 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB
Traffic Volume (vph)	25	250	75	65	560	205	110	345	45	80	340	70
Future Volume (vph)	25	250	75	65	560	205	110	345	45	80	340	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	10.2	10.2	4.8	4.8	4.8	5.5
Lane Util. 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
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.97	0.97	0.97	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99
Frt Protected	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99
Sat'd Flow (prot)	3315	3207	3207	3207	3207	3207	3173	3173	3201	3201	3201	3201
FIL Permitted	0.86	0.86	0.86	0.86	0.86	0.86	0.72	0.72	0.80	0.80	0.80	0.80
Sat'd Flow (perm)	2855	2855	2835	2835	2835	2835	2302	2302	2567	2567	2567	2567
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	263	79	68	589	216	116	363	47	84	358	74
RTOR Reduction (vph)	0	21	0	0	27	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	347	0	0	846	0	0	520	0	0	503	0
Conf. Bikes (#/hr)	80	85	85	85	80	85	120	120	5	5	10	85
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	Perm	NA	Perm	NA	Perim	NA	Perim	custom	MA	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10	6 10
Permitted Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10	6 10
Actuated Green, G (s)	38.0	39.0	39.0	40.6	40.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Effective Green, g (s)	39.0	39.0	39.0	41.6	41.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Actuated g/C Ratio	0.41	0.41	0.41	0.43	0.43	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1162	1154	1154	999	999	1246	1246	1246	1246	1246	1246	1246
v/s Ratio Prot												
v/s Ratio Perm	0.12	0.30	0.73	60.23	60.23	0.16	0.16	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.30	0.73	0.73	0.52	0.52	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Uniform Delay, d1	19.2	24.0	24.0	19.8	19.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	2.4	2.4	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	19.3	26.5	26.5	20.3	20.3	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Level of Service	B	C	C	C	C	B	B	B	B	B	B	B
Approach Delay (s)	19.3	26.5	26.5	20.3	20.3	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Approach LOS	B	C	C	C	C	B	B	B	B	B	B	B
Intersection Summary												
HCM 2000 Control Delay	21.8 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	95.8 Sum of lost time (s)											
Intersection Capacity Utilization	100.8% ICU Level of Service G											
Analysis Period (min)	15											
c Critical Lane Group												

3. Sackville Street & Gerrard Street E 2032 Future Total AM Model (Sensitivity) 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB	4TB
Traffic Volume (vph)	330	135	880	330	135	880	330	135	880	330	135	880
Future Volume (vph)	330	135	880	330	135	880	330	135	880	330	135	880
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	4.8	4.8	4.8	4.8	4.8	4.8	10.2	10.2	4.8	4.8	4.8	5.5
Lane Util. 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
Frbp. ped/bikes	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.97	0.97	0.97	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99
Frt Protected	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99
Sat'd Flow (prot)	3315	3207	3207	3207	3207	3207	3173	3173	3201	3201	3201	3201
FIL Permitted	0.86	0.86	0.86	0.86	0.86	0.86	0.72	0.72	0.80	0.80	0.80	0.80
Sat'd Flow (perm)	2855	2855	2835	2835	2835	2835	2302	2302	2567	2567	2567	2567
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	263	79	68	589	216	116	363	47	84	358	74
RTOR Reduction (vph)	0	21	0	0	27	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	347	0	0	846	0	0	520	0	0	503	0
Conf. Bikes (#/hr)	80	85	85	85	80	85	120	120	5	5	10	85
Heavy Vehicles (%)	13%	0%	2%	1%	1%	11%	6%	8%	0%	11%	6%	2%
Turn Type	Perim	MA	Perm	NA	Perm	NA	Perim	NA	Perim	custom	MA	MA
Protected Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10	6 10
Permitted Phases	4 11	8 12	8 12	2 9	2 9	6 10	6 10	6 10	6 10	6 10	6 10	6 10
Actuated Green, G (s)	38.0	39.0	39.0	40.6	40.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Effective Green, g (s)	39.0	39.0	39.0	41.6	41.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
Actuated g/C Ratio	0.41	0.41	0.41	0.43	0.43	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1162	1154	1154	999	999	1246	1246	1246	1246	1246	1246	1246
v/s Ratio Prot												
v/s Ratio Perm	0.12	0.30	0.73	60.23	60.23	0.16	0.16	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.30	0.73	0.73	0.52	0.52	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Uniform Delay, d1	19.2	24.0	24.0	19.8	19.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	2.4	2.4	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	19.3	26.5	26.5	20.3	20.3	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Level of Service	B	C	C	C	C	B	B	B	B	B	B	B
Approach Delay (s)	19.3	26.5	26.5	20.3	20.3	17.1	17.1	17.1	17.1	17.1	17.1	17.1
Approach LOS	B	C	C	C	C	B	B	B	B	B	B	B
Intersection Summary												
Cycle Length: 105												
Actuated Cycle Length: 85												
Natural Cycle: 85												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.65												
Intersection Signal Delay: 11.1												
Intersection Capacity Utilization: 68.8%												
Analysis Period (min): 15												
ICU Level of Service: C												



Queues  
3. Sackville Street & Gerrard Street E

2032 Future Total AM Model (Sensitivity)  
04-04-2023

	→	←	←	→
	EBT	WBT	SBT	SBT
Lane Group	401	1115	114	
Lane Group Flow (vph)	0.20	0.65	0.28	
v/c Ratio	5.6	10.9	33.2	
Control Delay	0.0	0.0	0.0	
Queue Delay	5.6	10.9	33.2	
Total Delay	11.2	49.6	17.5	
Queue Length 50th (m)	16.0	64.5	35.3	
Queue Length 95th (m)	58.8	47.8	15.3	
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2218	1896	415	
Starvation Cap Reductn	0	0	0	
Spillback Cap Reductn	0	0	0	
Storage Cap Reductn	0	0	0	
Reduced v/c Ratio	0.18	0.59	0.27	
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
3. Sackville Street & Gerrard Street E

2032 Future Total AM Model (Sensitivity)  
04-04-2023

	→	←	←	→								
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4↑	4↑	4↑	4↑							
Traffic Volume (vph)	0	330	35	135	880	0	0	0	0	0	55	35
Future Volume (vph)	0	330	35	135	880	0	0	0	0	0	55	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5
Total Lost time (s)		4.0		4.0							4.7	
Lane Util. Factor		0.95		0.95							1.00	
Frbp. ped/bikes		0.98		1.00							0.99	
Frbp. ped/bikes		1.00		0.99							0.91	
Frt		0.99		1.00							0.98	
Frt Protected		1.00		0.99							0.97	
Sat'd. Flow (prot)		3171		3347							1561	
Flt Permitted		1.00		0.81							0.97	
Sat'd. Flow (perm)		3171		2745							1561	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	363	38	148	967	0	0	0	0	0	60	38
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	0	392	0	0	1115	0	0	0	0	0	109	0
Confl. Peds. (#/hr)	40	60	60	60	60	40	60	140	140	60	60	5
Confl. Bikes (#/hr)	0	10%	0%	9%	4%	0%	0%	0%	0%	0%	6%	6%
Heavy Vehicles (%)												
Turn Type	NA	Perm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	2.9			6.10							4	
Permitted Phases				6.10							4	
Actuated Green, G (s)	56.3			56.3							21.6	
Effective Green, g (s)	57.3			57.3							22.6	
Actuated g/C Ratio	0.67			0.67							0.26	
Clearance Time (s)											5.7	
Vehicle Extension (s)											3.0	
Lane Grp Cap (vph)	2122			1837							412	
v/s Ratio Prot	0.12											
v/s Ratio Perm				0.41								
v/c Ratio	0.18			0.61							0.07	
Uniform Delay, d1	5.3			7.9							24.9	
Progression Factor	1.00			1.00							1.00	
Incremental Delay, d2	0.0			0.6							0.3	
Delay (s)	5.4			8.5							25.3	
Level of Service	A			A							C	
Approach Delay (s)	5.4			8.5				0.0			25.3	
Approach LOS	A			A				A			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay				8.9				HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio				0.52								
Actuated Cycle Length (s)				85.6				Sum of lost time (s)			9.7	
Intersection Capacity Utilization				68.8%				ICU Level of Service			C	
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 4: Gerrard Street E & Gifford Street

04-04-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	1↑		W	
Traffic Volume (veh/h)	5	380	1010	20	5	5
Future Volume (Veh/h)	5	380	1010	20	5	5
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	396	1052	21	5	5
Pedestrians		5	5		50	
Lane Width (m)		3.5	3.5	3.0		
Walking Speed (m/s)		1.1	1.1	1.1		
Percent Blockage		0	0		4	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		72	141			
pX platoon unblocked	0.86			0.87	0.86	
VC, conflicting volume	1123			1326	592	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	817			976	198	
IC, single (s)	4.1			7.5	7.3	
IC, 2 stage (s)						
p0 queue free %	2.2			3.8	3.5	
IF (s)	99			97	99	
CM capacity (veh/h)	678			165	623	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	137	264	701	372	10	
Volume Left	5	0	0	0	5	
Volume Right	0	0	0	21	5	
cSH	678	1700	1700	1700	261	
Volumes to Capacity	0.01	0.16	0.41	0.22	0.04	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.9	
Control Delay (s)	0.5	0.0	0.0	0.0	19.3	
Lane LOS	A				C	
Approach Delay (s)	0.2		0.0		19.3	
Approach LOS					C	
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			40.2%		ICU Level of Service A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 5: Gerrard Street E & Nasmith Avenue

04-04-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4↑	1↑		W	
Traffic Volume (veh/h)	5	380	1020	5	15	10
Future Volume (Veh/h)	5	380	1020	5	15	10
Sign Control		Free	Free	Stop		
Grade		0%	0%	0%		
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	392	1052	5	15	10
Pedestrians					75	
Lane Width (m)					3.0	
Walking Speed (m/s)					1.1	
Percent Blockage					6	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		145	68			
pX platoon unblocked	0.84			0.84	0.84	0.84
VC, conflicting volume	1132			1336	604	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	773			1015	143	
IC, single (s)	4.1			6.9	7.1	
IC, 2 stage (s)						
p0 queue free %	99			92	99	
IF (s)	2.2			3.6	3.4	
CM capacity (veh/h)	674			177	676	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volumes Total	136	261	701	356	25	
Volume Left	5	0	0	0	15	
Volume Right	0	0	0	5	10	
cSH	674	1700	1700	1700	252	
Volumes to Capacity	0.01	0.15	0.41	0.21	0.10	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.5	
Control Delay (s)	0.5	0.0	0.0	0.0	20.9	
Lane LOS	A				C	
Approach Delay (s)	0.2		0.0		20.9	
Approach LOS					C	
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			38.4%		ICU Level of Service A	
Analysis Period (min)			15			



Timings 2032 Future Total AM Model (Sensitivity) 04-04-2023

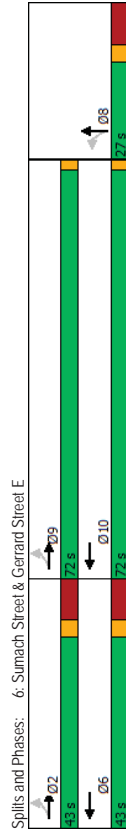
Queues 2032 Future Total AM Model (Sensitivity) 04-04-2023

6: Summach Street & Gerrard Street E

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations		4↑	4↑	4↑				
Traffic Volume (vph)	5	390	920	10				
Future Volume (vph)	5	390	920	10				
Turn Type	Perm	NA	NA	NA				
Protected Phases		2, 9	6, 10	8	2	6	9	10
Permitted Phases	2, 9							
Detector Phase	2	2	6	8				
Switch Phase								
Minimum Initial (s)				15.0	11.0	5.0	5.0	
Minimum Split (s)				25.4	26.2	72.0	72.0	
Total Split (s)				27.0	43.0	72.0	72.0	
Total Split (%)				19.0%	30%	51%	51%	
Yellow Time (s)				3.0	3.0	2.0	2.0	
All-Red Time (s)				7.4	7.2	0.0	0.0	
Lost Time Adjust (s)				-1.0				
Total Lost Time (s)				9.4				
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode				None	Min	None	None	
Act Effct Green (s)		56.4	56.4	20.0				
Actuated g/C Ratio		0.58	0.58	0.20				
v/c Ratio		0.25	0.64	0.84				
Control Delay		8.5	12.6	63.1				
Queue Delay		0.0	0.3	0.0				
Total Delay		8.5	12.9	63.1				
LOS		A	B	E				
Approach Delay		8.5	12.9	63.1				
Approach LOS		A	B	E				
Intersection Summary								
Cycle Length: 142								
Actuated Cycle Length: 97.6								
Natural Cycle: 125								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.84								
Intersection Signal Delay: 18.4								
Intersection Capacity Utilization 66.8%								
Analysis Period (min) 15								

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	454	1201	247
v/c Ratio	0.25	0.64	0.84
Control Delay	8.5	12.6	63.1
Queue Delay	0.0	0.3	0.0
Total Delay	8.5	12.9	63.1
Queue Length 50th (m)	17.7	62.1	26.3
Queue Length 95th (m)	22.2	70.4	#130.9
Internal Link Dist (m)	44.0	75.7	33.2
Turn Bay Length (m)			
Base Capacity (vph)	1899	1950	295
Starvation Cap Reductn	0	253	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.24	0.71	0.84
Intersection Summary			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			



6: Summach Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis  
 2032 Future Total AM Model (Sensitivity)  
 04-04-2023

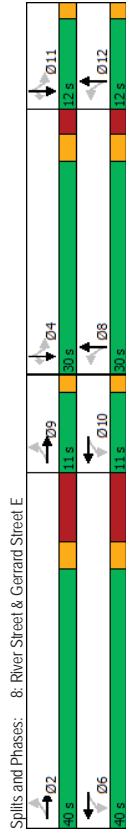
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1		1+1			4+1					
Traffic Volume (vph)	5	390	0	0	920	125	105	10	100	0	0	0
Future Volume (vph)	5	390	0	0	920	125	105	10	100	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp. ped/bikes	1.00			0.97			0.94					
Frbp. ped/bikes	1.00			1.00			0.91					
Frt	1.00			0.98			0.94					
Flt Protected	1.00			1.00			0.98					
Sat'd. Flow (prot)	3399			3279			1455					
Flt Permitted	0.94			1.00			0.98					
Sat'd. Flow (perm)	3184			3279			1455					
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	6	448	0	0	1057	144	121	11	115	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	20	0	0	0	0
Lane Group Flow (vph)	0	454	0	0	1192	0	0	227	0	0	0	0
Conf. Bikes (#/hr)	65	85	85	85	85	65	100	65	65	65	65	100
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Permi	MA	NA	NA	Permi	NA	NA	NA	NA	NA	NA	NA
Protected Phases		2.9		6.10			8					
Permitted Phases		2.9					8					
Effective Green, G (s)		65.2		65.2			18.9					
Actuated Green, g (s)		66.2		66.2			19.9					
Actuated g/C Ratio		0.69		0.69			0.21					
Clearance Time (s)							10.4					
Vehicle Extension (s)							3.0					
Lane Grp Cap (vph)		2184		2249			300					
v/s Ratio Prot				c0.36								
v/s Ratio Perm		0.14					0.16					
v/c Ratio		0.21		0.53			0.76					
Uniform Delay, d1		5.5		7.5			36.0					
Progression Factor		1.00		1.00			1.00					
Incremental Delay, d2		0.0		0.2			10.4					
Delay (s)		5.6		7.7			46.4					
Level of Service		A		A			D					0.0
Approach Delay (s)		5.6		7.7			46.4					0.0
Approach LOS		A		A			D					A
Intersection Summary												
HCM 2000 Control Delay	12.2 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	96.5 Sum of lost time (s)											
Intersection Capacity Utilization	66.8% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

7: Street J/Sword Street & Gerrard Street E  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total AM Model (Sensitivity)  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+1		4+1			4+1					
Traffic Volume (veh/h)	0	450	40	10	1040	0	0	0	0	10	0	5
Future Volume (Veh/h)	0	450	40	10	1040	0	0	0	0	10	0	5
Sign Control		Free		Free			Stop			Stop		
Grade		0%		0%			0%			0%		
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
Hourly flow rate (vph)	0	474	42	11	1095	0	0	0	0	11	0	5
Pedestrians												75
Lane Width (m)												3.0
Walking Speed (m/s)												1.1
Percent Blockage												6
Right turn flare (veh)												
Median type		None					None					
Median storage (veh)												
Upstream signal (m)		100					91					
pX platoon unblocked	0.79			0.97			0.81	0.81	0.97	0.81	0.81	0.79
vC, conflicting volume	1170			516			1070	1687	258	1429	1708	622
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCU, unblocked vol	692			450			460	1227	186	907	1253	1
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	93	100	99
dM capacity (veh/h)	682			1092			372	135	810	169	131	814
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1							
Volumes Total	316	200	376	730	16							
Volume Left	0	0	11	0	11							
Volume Right	0	42	0	0	5							
cSH	1700	1700	1092	1700	224							
Volumes to Capacity	0.19	0.12	0.01	0.43	0.07							
Queue Length 95th (m)	0.0	0.0	0.2	0.0	1.7							
Control Delay (s)	0.0	0.0	0.3	0.0	22.3							
Lane LOS			A		C							
Approach Delay (s)	0.0	0.1		22.3								
Approach LOS				C								
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	45.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

Timings 8: River Street & Gerrard Street E 2032 Future Total AM Model (Sensitivity) 04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations												
Traffic Volume (vph)	125	275	160	830	50	365	125	365	170			
Future Volume (vph)	125	275	160	830	50	365	125	365	170			
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	2.9	6.10	6.10	8.12	8.12	4.11	4.11	4.11	4.11	2	4	6
Permitted Phases	2	2	6	6	8	8	4	4	4			
Detector Phase												
Switch Phase												
Minimum Initial (s)										23.0	19.0	23.0
Minimum Spilt (s)										33.8	30.0	33.8
Total Spilt (s)										40.0	30.0	40.0
Total Spilt (%)										43%	32%	43%
Yellow Time (s)										3.0	3.0	3.0
All-Red Time (s)										7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode										Min	Min	Min
Act Effct Green (s)	36.8		36.8	29.9	29.9	29.9	29.9	29.9	29.9			
Actuated g/C Ratio	0.45		0.45	0.37	0.37	0.37	0.37	0.37	0.37			
v/C Ratio	0.866d		1.04	0.21	0.71	0.64	0.56	0.30	0.30			
Control Delay	22.2		62.0	21.2	28.7	38.2	24.6	8.9	8.9			
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	22.2		62.0	21.2	28.7	38.2	24.6	8.9	8.9			
LOS	C		E	C	C	D	C	C	A			
Approach Delay	22.2		62.0	28.0	28.0	23.1	23.1	23.1	23.1			
Approach LOS	C		E	C	C	C	C	C	C			
Intersection Summary												
Cycle Length	93											
Actuated Cycle Length	81.9											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/C Ratio	1.04											
Intersection Signal Delay	40.2											
Intersection Capacity Utilization	118.0%											
Analysis Period (min)	15											
di Defacto Left Lane	Recode with 1 through lane as a left lane.											



Timings 8: River Street & Gerrard Street E 2032 Future Total AM Model (Sensitivity) 04-04-2023

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Spilt (s)	30.0	11.0	11.0	12.0	12.0
Total Spilt (s)	30.0	11.0	11.0	12.0	12.0
Total Spilt (%)	32%	12%	12%	13%	13%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode					
Act Effct Green (s)	Min	None	None	None	None
Actuated g/C Ratio					
v/C Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

8: River Street & Gerrard Street E

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	479	1220	52	453	130	380	177
v/c Ratio	0.86d1	1.04	0.21	0.71	0.64	0.56	0.30
Control Delay	22.2	62.0	21.2	28.7	38.2	24.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	62.0	21.2	28.7	38.2	24.6	8.9
Queue Length 50th (m)	29.3	-105.3	6.0	62.8	17.9	50.4	6.9
Queue Length 95th (m)	50.2	#166.0	14.4	95.6	38.9	76.7	20.2
Internal Link Dist (m)	67.0	81.6		126.5		61.7	
Turn Bay Length (m)			30.0				
Base Capacity (vph)	751	1171	252	668	213	708	609
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.04	0.21	0.68	0.61	0.54	0.29
<b>Intersection Summary</b>							
-	Volume exceeds capacity, queue is theoretically infinite.						
-	Queue shown is maximum after two cycles.						
#	95th percentile volume exceeds capacity, queue may be longer.						
-	Queue shown is maximum after two cycles.						
d1	Defacto Left Lane. Recode with 1 though lane as a left lane.						

8: River Street & Gerrard Street E

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4TB					
Traffic Volume (vph)	125	275	60	160	830	180	50	365	70	125	365	170
Future Volume (vph)	125	275	60	160	830	180	50	365	70	125	365	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Lane Util. 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
Frbp. ped/bikes	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Flt Protected	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Satd. Flow (prot)	3151	3266	1528	1738	1528	1738	1528	1738	1528	1738	1528	1738
Flt Permitted	0.52	0.78	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Satd. Flow (perm)	1649	2577	665	1738	665	1738	665	1738	665	1738	665	1738
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	130	286	62	167	865	188	52	380	73	130	380	177
RTOR Reduction (vph)	0	10	0	13	0	0	0	7	0	0	0	67
Lane Group Flow (vph)	0	469	0	0	1207	0	52	446	0	130	380	110
Conf. Peds. (#/hr)	50	95	95	95	95	95	40	85	85	40	85	40
Conf. Bikes (#/hr)	10	10	10	10	10	10	15	15	15	10	10	10
Heavy Vehicles (%)	4%	8%	4%	0%	3%	1%	8%	4%	2%	3%	1%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2.9	6.10	6.10	8.12	8.12	8.12	4.11	4.11	4.11	4.11	4.11	4.11
Permitted Phases	2.9	6.10	6.10	45.5	33.8	33.8	34.8	34.8	34.8	34.8	34.8	34.8
Actuated Green, G (s)	45.5	46.5	46.5	0.56	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Effective Green, g (s)	46.5	46.5	46.5	0.56	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	920	1438	277	726	277	726	234	777	234	777	593	593
v/s Ratio Prot												
v/s Ratio Perm	0.28	0.47	0.08	0.08	0.08	0.08	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.86d1	1.04	0.21	0.71	0.64	0.56	0.30	0.30	0.30	0.30	0.30	0.30
Uniform Delay, d1	11.4	15.3	19.0	18.4	17.7	15.3	16.8	16.8	16.8	16.8	16.8	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	4.5	0.3	1.6	2.8	0.5	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	11.8	19.8	19.8	19.8	20.5	18.2	18.2	18.2	18.2	18.2	18.2	18.2
Level of Service	B	B	B	B	C	C	B	B	B	B	B	B
Approach Delay (s)	11.8	19.8	19.8	19.8	20.0	18.1	18.1	18.1	18.1	18.1	18.1	18.1
Approach LOS	B	B	B	B	C	C	B	B	B	B	B	B
<b>Intersection Summary</b>												
HCM 2000 Control Delay	18.1 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	83.3											
Intersection Capacity Utilization	118.0% Sum of lost time (s) 16.8											
Analysis Period (min)	15											
d1	Defacto Left Lane. Recode with 1 though lane as a left lane.											
c	Critical Lane Group											

9. Sackville Street & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total AM Model (Sensitivity)  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	80	55	0	0	0	0	0	0	20	160
Future Volume (Veh/h)	0	0	80	55	0	0	0	0	0	0	20	160
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	0	0	104	71	0	0	0	0	0	0	26	208
Pedestrians	70	70	70	40	40	40	15	15	15	10	10	10
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	0.0	0.0	0.0	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	6	6	6	4	4	4	0	0	0	1	1	1
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	356	386	309	435	402	50	310					40
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	356	386	309	435	402	50	310					40
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
IF (s)	100	100	85	82	100	100	100					98
CM capacity (veh/h)	513	490	690	401	480	979	1184					1527
Direction, Lane #	EB 1	WB 1	SB 1									
Volumes Total	104	71	266									
Volume Left	0	71	26									
Volume Right	104	0	32									
cSH	690	401	1527									
Volumes to Capacity	0.15	0.18	0.02									
Queue Length 95th (m)	4.0	4.8	0.4									
Control Delay (s)	11.1	15.9	0.9									
Lane LOS	B	C	A									
Approach Delay (s)	11.1	15.9	0.9									
Approach LOS	B	C	A									
Intersection Summary												
Average Delay			5.7									
Intersection Capacity Utilization			35.7%									A
Analysis Period (min)			15									

10. Parliament Street & Oak Street  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total AM Model (Sensitivity)  
 04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	105	395	10	5	475
Future Volume (Veh/h)	70	105	395	10	5	475
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	74	111	416	11	5	500
Pedestrians	260	260	5	5	175	175
Lane Width (m)	3.0	3.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	20	20	0	0	15	15
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)			151			143
pX platoon unblocked						
VC, conflicting volume	946	648				687
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	899	636				675
IC, single (s)	6.8	7.0				4.1
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IF (s)	67	60				99
CM capacity (veh/h)	222	279				740
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	185	277	150	172	333	
Volume Left	74	0	0	5	0	
Volume Right	111	0	11	0	0	
cSH	253	1700	1700	740	1700	
Volumes to Capacity	0.73	0.16	0.09	0.01	0.20	
Queue Length 95th (m)	38.8	0.0	0.0	0.2	0.0	
Control Delay (s)	50.1	0.0	0.0	0.4	0.0	
Lane LOS	F	C	A	A	A	
Approach Delay (s)	50.1	0.0	0.0	0.1	0.0	
Approach LOS	F	C	A	A	A	
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			38.1%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 11: Oak Street & Dreamer's Way

04-04-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	15	125	0	15	55
Future Volume (Veh/h)	0	15	125	0	15	55
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	18	152	0	18	67
Pedestrians	15				40	
Lane Width (m)	3.5	3.5	3.0	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	1				3	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked					210	207
VC conflicting volume	192					
VC1 stage 1 conf vol						
VC2 stage 2 conf vol	192				210	207
VCu unblocked vol	4.1				6.4	6.3
IC single (s)						
IC 2 stage (s)	2.2				3.5	3.4
p0 queue free %	100				98	91
CM capacity (veh/h)	1351				759	774
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	18	152	85			
Volume Left	0	0	18			
Volume Right	0	0	67			
CSH	1700	1700	771			
Volumes to Capacity	0.01	0.09	0.11			
Queue Length 95th (m)	0.0	0.0	2.8			
Control Delay (s)	0.0	0.0	10.2			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			28.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 12: Regent Street & Oak Street

04-04-2023

Movement	EBT	EBR	WBT	WBR	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	30	0	0	95	30	25
Future Volume (Veh/h)	30	0	0	95	30	25
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	38	0	0	122	38	32
Pedestrians	15			10	30	
Lane Width (m)	3.5	3.5	3.5	3.0	3.0	3.0
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	1			1	2	
Right turn flare (veh)						
Median type	None	None	None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked				68	205	78
VC conflicting volume						
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol				68	205	78
IC single (s)				4.1	6.4	6.2
IC 2 stage (s)				2.2	3.5	3.3
p0 queue free %	100			100	95	97
CM capacity (veh/h)	1511			1511	751	947
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	38	122	70			
Volume Left	0	0	38			
Volume Right	0	0	32			
CSH	1700	1700	829			
Volumes to Capacity	0.02	0.07	0.08			
Queue Length 95th (m)	0.0	0.0	2.1			
Control Delay (s)	0.0	0.0	9.7			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			28.9%		ICU Level of Service	A
Analysis Period (min)			15			



14: Sackville Street & Oak Street

15: Sumach Street & Oak Street

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)

04-04-2023

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop		Stop		Stop		Stop		Stop		Stop
Traffic Volume (vph)	0	30	15	0	20	0	0	0	0	0	60	165
Future Volume (vph)	0	30	15	0	20	0	0	0	0	0	60	165
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
Hourly flow rate (vph)	0	37	19	0	25	0	0	0	0	0	74	204
Direction, Lane #												
	EB 1	WB 1	SB 1									
Volume Total (vph)	56	25	364									
Volume Left (vph)	0	0	74									
Volume Right (vph)	19	0	86									
Head (s)	-0.10	0.00	0.00									
Departure Headway (s)	4.7	4.8	4.1									
Degree Utilization, x	0.07	0.03	0.41									
Capacity (veh/h)	710	687	860									
Control Delay (s)	8.0	8.0	10.0									
Approach Delay (s)	8.0	8.0	10.0									
Approach LOS	A	A	A									
Intersection Summary												
Delay	9.6											
Level of Service	A											
Intersection Capacity Utilization	41.6%											
ICU Level of Service	A											
Analysis Period (min)	15											



HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 16: Tubman Avenue/Street 'J' & Oak Street

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	65	0	0	0	0	0	0	0	35	45	35
Future Volume (Veh/h)	0	65	0	0	0	0	0	0	0	35	45	35
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	87	0	0	0	0	0	0	0	47	60	47
Pedestrians	40	40	40	10	10	10	45	45	45	47	60	47
Lane Width (m)	3.5	3.5	3.5	0.0	0.0	0.0	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	4	4	4	0	0	0	0	0	0	0	0	0
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked												
VC, conflicting volume	0	132	0	132	0	132	249	132	142	97	132	40
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	0	132	0	132	0	132	249	132	142	97	132	40
IC, single (s)	4.1	4.1	4.1	4.1	4.1	4.1	7.1	6.5	6.7	7.1	6.5	6.2
IC, 2 stage (s)												
IF (s)	2.2	2.2	2.2	2.2	2.2	2.2	3.5	4.0	3.8	3.5	4.0	3.3
p0 queue free %	100	100	100	100	100	100	100	100	100	95	92	95
pM capacity (veh/h)	1636	1636	1636	1466	1466	1466	612	762	793	890	762	1000
Direction, Lane #	EB 1	SB 1										
Volumes Total	87	154										
Volume Left	0	47										
Volume Right	0	47										
cSH	1700	863										
Volumes to Capacity	0.05	0.18										
Queue Length 95th (m)	0.0	4.9										
Control Delay (s)	0.0	10.1										
Lane LOS	B	B										
Approach Delay (s)	0.0	10.1										
Approach LOS	B	B										
Intersection Summary												
Average Delay		6.4										
Intersection Capacity Utilization		31.9%										A
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 18: River Street & Oak Street

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	60	35	0	65	0	380	25	40	545	0
Future Volume (Veh/h)	40	0	60	35	0	65	0	380	25	40	545	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	44	0	66	38	0	71	0	418	27	44	599	0
Pedestrians	75	75	75	65	65	65	35	35	35	3.5	3.5	5
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	1.1	1.1	1.1	1.1	1.1	1.1
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	7	7	7	6	6	6	3	3	3	3	3	0
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked												
VC, conflicting volume	1270	1272	709	1284	1258	502	674					
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	838	841	569	856	825	229	527					
IC, single (s)	7.2	6.5	6.2	7.1	7.0	6.2	4.1					
IC, 2 stage (s)												
IF (s)	3.6	4.0	3.3	3.5	4.5	3.3	2.2					
p0 queue free %	74	100	84	76	100	88	100					
pM capacity (veh/h)	171	220	404	159	188	597	832					
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	110	109	445	643								
Volume Left	44	38	0	44								
Volume Right	66	71	27	0								
cSH	262	304	1700	991								
Volumes to Capacity	0.42	0.36	0.26	0.04								
Queue Length 95th (m)	15.0	12.0	0.0	1.1								
Control Delay (s)	28.4	23.3	0.0	1.2								
Lane LOS	D	C	A	A								
Approach Delay (s)	28.4	23.3	0.0	1.2								
Approach LOS	D	C	C	C								
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			75.0%									D
Analysis Period (min)			15									

19: Parliament Street & Cole Street

2032 Future Total AM Model (Sensitivity)

04-04-2023

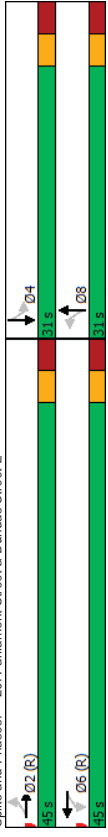
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	405	20	25	520
Future Volume (Veh/h)	0	0	405	20	25	520
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	440	22	27	565
Pedestrians	250		10			15
Lane Width (m)	0.0	3.5	3.5			3.5
Walking Speed (m/s)	1.1	1.1	1.1			1.1
Percent Blockage	0		1			1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			80			214
pX platoon unblocked	0.94	0.94		0.94		
VC, conflicting volume	1048	496				712
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	925	339				569
IC, single (s)	6.8	6.9				4.2
IC, 2 stage (s)						
IF (s)	3.5	3.3				2.2
p0 queue free %	100	100				97
CM capacity (veh/h)	246	615				928
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	293	169	215	377		
Volume Left	0	0	27	0		
Volume Right	0	22	0	0		
cSH	1700	1700	928	1700		
Volumes to Capacity	0.17	0.10	0.03	0.22		
Queue Length 95th (m)	0.0	0.0	0.7	0.0		
Control Delay (s)	0.0	0.0	1.4	0.0		
Lane LOS			A			
Approach Delay (s)	0.0		0.5			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			45.7%			
Analysis Period (min)			15			
ICU Level of Service			A			

20: Parliament Street & Dundas Street E

2032 Future Total AM Model (Sensitivity)

04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	305	60	335	40	305	65	395
Future Volume (vph)	35	305	60	335	40	305	65	395
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4	
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
Total Split (s)	45.0	45.0	45.0	45.0	31.0	31.0	31.0	31.0
Total Split (%)	59.2%	59.2%	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)								
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.1	41.1	41.1	41.1	24.9	24.9	24.9	24.9
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.33	0.33	0.33	0.33
v/C Ratio	0.26	0.35	0.35	0.44	0.60	0.60	0.60	0.60
Control Delay	9.8	12.4	12.4	21.3	23.6	23.6	23.6	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	12.4	12.4	21.3	23.6	23.6	23.6	23.6
LOS	A	B	B	C	C	C	C	C
Approach Delay	9.8	12.4	12.4	21.3	23.6	23.6	23.6	23.6
Approach LOS	A	B	B	C	C	C	C	C
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 54 (7%), Referenced to phase 2EBTL and 6:WBT, Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/C Ratio: 0.60								
Intersection Signal Delay: 17.1								
Intersection Capacity Utilization 93.3%								
Analysis Period (min) 15								



20: Parliament Street & Dundas Street E

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	388	510	383	553
v/c Ratio	0.26	0.35	0.44	0.60
Control Delay	9.8	12.4	21.3	23.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.8	12.4	21.3	23.6
Queue Length 50th (m)	13.4	27.1	22.4	33.9
Queue Length 95th (m)	23.6	38.4	31.5	45.4
Internal Link Dist (m)	85.0	103.5	45.0	56.1
Turn Bay Length (m)				
Base Capacity (vph)	1531	1459	921	968
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	0.25	0.35	0.42	0.57
Intersection Summary				

20: Parliament Street & Dundas Street E

	→	←	↑	↓
Movement	EBL	EBT	EBR	WBL
Lane Configurations		4TB		4TB
Traffic Volume (vph)	35	305	25	335
Future Volume (vph)	35	305	25	335
Ideal Flow (vphpl)	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.5
Total Lost time (s)	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	0.95	0.95	0.95
Frbp. ped/bikes	0.99	0.97	0.99	0.99
Frbp. psd/bikes	0.99	0.99	0.99	0.99
Frt	0.99	0.97	0.99	0.99
Flt Protected	1.00	0.99	0.99	0.99
Satd. Flow (prot)	3170	3062	3111	3237
Flt Permitted	0.88	0.85	0.84	0.84
Satd. Flow (perm)	2792	2632	2636	2748
Peak-hour factor, PHF	0.94	0.94	0.94	0.94
Adj. Flow (vph)	37	324	27	356
RTOR Reduction (vph)	0	7	0	23
Lane Group Flow (vph)	0	381	0	487
Confl. Peds. (#/hr)	155	110	110	155
Confl. Bikes (#/hr)	10	10	25	25
Heavy Vehicles (%)	6%	10%	4%	22%
Parking (#/hr)	0	0	0	0
Turn Type	Perm	NA	Perm	NA
Protected Phases	2	2	6	6
Permitted Phases	2	6	6	6
Actuated Green, G (s)	40.1	40.1	40.1	40.1
Effective Green, g (s)	41.1	41.1	24.9	24.9
Actuated g/C Ratio	0.54	0.54	0.33	0.33
Clearance Time (s)	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1509	1423	863	900
v/s Ratio Prot	0.14	0.18	0.14	0.20
v/c Ratio Perm	0.25	0.34	0.44	0.60
Uniform Delay, d1	9.3	9.8	20.1	21.4
Progression Factor	1.00	1.27	1.00	1.00
Incremental Delay, d2	0.4	0.6	0.4	1.1
Delay (s)	9.7	13.1	20.4	22.5
Level of Service	A	B	C	C
Approach Delay (s)	9.7	13.1	20.4	22.5
Approach LOS	A	B	C	C
Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

21: Regent Street & Dundas Street E

04-04-2023

2032 Future Total AM Model (Sensitivity)

04-04-2023

2032 Future Total AM Model (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T				4T			4T	
Traffic Volume (veh/h)	10	380	10	10	455	35	15	10	5	20	10	20
Future Volume (Veh/h)	10	380	10	10	455	35	15	10	5	20	10	20
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	413	11	11	495	38	16	11	5	22	11	22
Pedestrians	20			5			70				80	
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
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2			0			6				7	
Right turn flare (veh)												
Median type	None	None	None	None	None	None	None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)	127			1.00	1.24		1.00	1.00	1.00	1.00	1.00	1.00
pX platoon unblocked	613			494			828	1146	287	860	1132	366
VC, conflicting volume												
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	613			492			826	1144	285	859	1131	366
IC, single (s)	4.1			4.1			7.6	6.7	6.9	7.6	6.5	7.1
IC, 2 stage (s)	2.2			2.2			3.6	4.1	3.3	3.5	4.0	3.4
p0 queue free %	99			99			92	93	99	88	94	96
CM capacity (veh/h)	907			1014			191	158	670	189	175	555
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 1	SB 1	SB 1				
Volume Total	218	218	258	286	32	55						
Volume Left	11	0	11	0	16	22						
Volume Right	0	11	0	38	5	22						
cSH	907	1700	1014	1700	199	251						
Volumes to Capacity	0.01	0.13	0.01	0.17	0.16	0.22						
Queue Length 95th (m)	0.3	0.0	0.3	0.0	4.3	6.2						
Control Delay (s)	0.6	0.0	0.5	0.0	26.5	23.3						
Lane LOS	A	A	A	D	C	C						
Approach Delay (s)	0.3		0.2	26.5	23.3							
Approach LOS			D	C								
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	36.5%											
Analysis Period (min)	15											
	ICU Level of Service A											

Spills and Phases: 22: Sackville Street & Dundas Street E



Regent Park Phases 4 & 5  
BA Group - NHY

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22: Sackville Street & Dundas Street E

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2032 Future Total AM Model (Sensitivity)

04-04-2023

2032 Future Total AM Model (Sensitivity)

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4T		4T		4T		4T
Traffic Volume (vph)	415	10	405	45	0	100	50
Future Volume (vph)	415	10	405	45	0	100	50
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4
Permitted Phases	2	6	6	8	8	4	4
Detector Phase							
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	46.5	46.5	46.5	19.5	19.5	19.5	19.5
Actuated g/C Ratio	0.61	0.61	0.61	0.26	0.26	0.26	0.26
v/C Ratio	0.23	0.23	0.42	0.22	0.22	0.62	0.62
Control Delay	7.6	6.6	6.6	12.1	12.1	29.1	29.1
Queue Delay	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Total Delay	7.6	6.9	6.9	12.1	12.1	29.1	29.1
LOS	A	A	A	B	B	C	C
Approach Delay	7.6	6.9	6.9	12.1	12.1	29.1	29.1
Approach LOS	A	A	A	B	B	C	C
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: T1 (14%), Referenced to phase 2EBT and 6WBTL Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/C Ratio: 0.62							
Intersection Signal Delay: 11.5							
Intersection Capacity Utilization 54.0%							
Analysis Period (min) 15							
	ICU Level of Service A						

Spills and Phases: 22: Sackville Street & Dundas Street E



Regent Park Phases 4 & 5  
BA Group - NHY

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22: Sackville Street & Dundas Street E

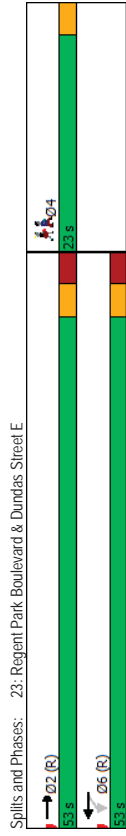
	EBT	WBT	NBT	SBT
Lane Group	463	437	73	216
Lane Group Flow (vph)	0.23	0.42	0.22	0.62
v/c Ratio	7.6	6.6	12.1	29.1
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	7.6	6.9	12.1	29.1
Total Delay	9.0	31.0	3.2	23.5
Queue Length 50th (m)	33.4	10.9	11.7	41.5
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2007	1066	372	388
Station Cap Reductn	0	208	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.51	0.20	0.56
<b>Intersection Summary</b>				

22: Sackville Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4+4			4			4+4					
Traffic Volume (vph)	0	415	25	10	405	0	45	0	25	100	50	55	
Future Volume (vph)	0	415	25	10	405	0	45	0	25	100	50	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.99	0.99	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.98	0.98	0.98	
Frbp. ped/bikes	1.00	1.00	1.00	1.00	0.97	0.97	0.97	0.97	0.97	0.95	0.95	0.95	
Frt	0.99	0.99	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.98	0.98	0.98	
Flt Protected	0.99	0.99	1.00	1.00	0.97	0.97	0.97	0.97	0.97	0.95	0.95	0.95	
Satd. Flow (prot)	3230	3230	1736	1736	1568	1568	1568	1568	1568	1571	1571	1571	
Flt Permitted	1.00	1.00	0.99	0.99	0.75	0.75	0.75	0.75	0.75	0.81	0.81	0.81	
Satd. Flow (perm)	3230	3230	1716	1716	1200	1200	1200	1200	1200	1303	1303	1303	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	437	26	11	426	0	47	0	26	105	53	58	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	463	0	0	437	0	0	41	0	0	198	0	
Confl. Peds. (#/hr)	65	85	85	85	65	65	65	60	60	60	60	65	
Confl. Bikes (#/hr)	10	10	25	25	25	25	25	25	25	25	25	25	
Heavy Vehicles (%)	0%	8%	13%	0%	8%	0%	0%	0%	8%	6%	2%	4%	
Turn Type	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Protected Phases	2	6	6	6	6	6	6	6	6	6	6	6	
Permitted Phases	4	4	4	4	4	4	4	4	4	4	4	4	
Actuated Green, G (s)	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	
Effective Green, g (s)	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1976	1049	1049	307	307	307	307	307	307	307	307	307	
v/s Ratio Prot	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
v/s Ratio Perm	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	
v/c Ratio	6.7	7.7	7.7	21.7	21.7	21.7	21.7	21.7	21.7	24.8	24.8	24.8	
Uniform Delay, d1	0.97	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Progression Factor	0.3	1.2	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Incremental Delay, d2	6.8	5.8	5.8	21.9	21.9	21.9	21.9	21.9	21.9	27.6	27.6	27.6	
Delay (s)	A	A	A	C	C	C	C	C	C	C	C	C	
Level of Service	A	A	A	C	C	C	C	C	C	C	C	C	
Approach Delay (s)	6.8	5.8	5.8	21.9	21.9	21.9	21.9	21.9	21.9	27.6	27.6	27.6	
Approach LOS	A	A	A	C	C	C	C	C	C	C	C	C	
<b>Intersection Summary</b>													
HCM 2000 Control Delay	11.1											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.0%											ICU Level of Service	A
Analysis Period (min)	15												
c Critical Lane Group													



Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	520	15	415	4
Future Volume (vph)	520	15	415	4
Turn Type	NA	Perm	NA	NA
Protected Phases	2	6	6	4
Permitted Phases	2	6	6	4
Detector Phase	2	6	6	4
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	0.0
Total Lost Time (s)	4.9	4.9	4.9	0.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.38	0.31	0.31	
Control Delay	4.3	4.6	4.6	
Queue Delay	0.0	0.0	0.0	
Total Delay	4.4	4.6	4.6	
LOS	A	A	A	
Approach Delay	4.4	4.6	4.6	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 8 (1%) Referenced to phase 2:EBT and 6:WBL, Start of 1st Green				
Natural Cycle: 55				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.38				
Intersection Signal Delay: 4.5	Intersection LOS: A			
Intersection Capacity Utilization 53.4%	ICU Level of Service A			
Analysis Period (min) 15				



Lane Group	EBT	WBT
Lane Group Flow (vph)	563	448
v/c Ratio	0.38	0.31
Control Delay	4.3	4.6
Queue Delay	0.0	0.0
Total Delay	4.4	4.6
Queue Length 50th (m)	9.8	0.0
Queue Length 95th (m)	31.6	45.2
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1466	1446
Starvation Cap Reductn	19	114
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.34
<b>Intersection Summary</b>		

23: Regent Park Boulevard & Dundas Street E

2032 Future Total AM Model (Sensitivity)

04-04-2023

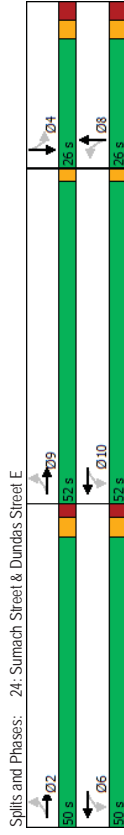
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Volume (vph)	520	20	15	415	0	0
Future Volume (vph)	520	20	15	415	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.99		1.00			
Frbp. ped/bikes	1.00		1.00			
Frt	0.99		1.00			
Frt Protected	1.00		1.00			
Sat'd Flow (prot)	1718		1729			
FIT Permitted	1.00		0.98			
Sat'd Flow (perm)	1718		1694			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	542	21	16	432	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	562	0	0	448	0	0
Conf. Peds. (#/hr)	125	125	40	60		
Heavy Vehicles (%)	8%	0%	9%	8%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases	6		6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1358		1339			
v/s Ratio Prot	0.33		0.26			
v/s Ratio Perm	0.41		0.33			
Uniform Delay, d1	2.5		2.3			
Progression Factor	0.82		1.00			
Incremental Delay, d2	0.9		0.7			
Delay (s)	2.9		2.9			
Level of Service	A		A			
Approach Delay (s)	2.9		2.9	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.9 HCM 2000 Level of Service A					
HCM 2000 Volume to Capacity ratio	0.37					
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 7.9					
Intersection Capacity Utilization	53.4% ICU Level of Service A					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

2032 Future Total AM Model (Sensitivity)

04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB					
Traffic Volume (vph)	15	460	30	400	15	30	60	0					
Future Volume (vph)	15	460	30	400	15	30	60	0					
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA					
Protected Phases	2 9		6 10		8		4						
Detector Phase	2		6		8		4						
Switch Phase													
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.0	16.0	5.0	5.0	5.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	21.0	21.0	52.0	52.0	52.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	50.0	50.0	52.0	52.0	52.0
Total Split (%)	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%	20.3%	39%	39%	41%	41%	41%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	0.0	0.0
Lost Time Adjust (s)					-1.0		-1.0						
Total Lost Time (s)					5.0		5.0						
Lead-Lag													
Lead-Lag Optimize?					None		None		Min	Min	None	None	None
Recall Mode													
Act Effct Green (s)	67.5		67.5		22.1		22.1						
Actuated g/C Ratio	0.68		0.68		0.22		0.22						
v/s Ratio	0.51		0.50		0.33		0.30						
Control Delay	8.5		8.3		29.2		28.6						
Queue Delay	3.2		0.5		0.0		0.0						
Total Delay	11.7		8.7		29.2		28.6						
LOS	B		A		C		C						
Approach Delay	11.7		8.7		29.2		28.6						
Approach LOS	B		A		C		C						
Intersection Summary													
Cycle Length: 128													
Actuated Cycle Length: 99.1													
Natural Cycle: 100													
Control Type: Actuated-Uncoordinated													
Maximum v/s Ratio: 0.51													
Intersection Signal Delay: 13.1													
Intersection Capacity Utilization: 62.9%													
Analysis Period (min): 15													



Queues 2032 Future Total AM Model (Sensitivity) 04-04-2023  
 24: Sumach Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	565	528	109	81
Lane Group Flow (vph)	0.51	0.50	0.33	0.30
v/c Ratio	8.5	8.3	29.2	28.6
Control Delay	3.2	0.5	0.0	0.0
Queue Delay	11.7	8.7	29.2	28.6
Total Delay	43.0	39.1	11.9	8.1
Queue Length 50th (m)	62.3	57.2	30.8	24.3
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	1174	1135	327	268
Station Cap Reductn	491	247	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.83	0.59	0.33	0.30
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity) 04-04-2023  
 24: Sumach Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4	4		4	4		4			4	4	
Traffic Volume (vph)	15	460	45	30	400	55	15	30	55	60	60	15	
Future Volume (vph)	15	460	45	30	400	55	15	30	55	60	60	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp. ped/bikes	0.96	0.96	0.97	0.97	0.97	0.92	0.92	0.92	0.92	0.94	0.94	0.94	
Frbp. ped/bikes	1.00	1.00	0.99	0.99	0.99	0.96	0.96	0.96	0.96	0.92	0.92	0.92	
Frt	0.99	0.99	0.98	0.98	0.98	0.93	0.93	0.93	0.93	0.97	0.97	0.97	
Flt Protected	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.96	0.96	0.96	
Satd. Flow (prot)	1652	1652	1652	1652	1652	1419	1419	1419	1419	1493	1493	1493	
Flt Permitted	0.98	0.98	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.73	0.73	0.73	
Satd. Flow (perm)	1626	1626	1572	1572	1572	1386	1386	1386	1386	1126	1126	1126	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	500	49	33	435	60	16	33	60	65	65	16	
RTOR Reduction (vph)	0	3	0	0	4	0	0	32	0	0	26	0	
Lane Group Flow (vph)	0	562	0	0	524	0	0	77	0	0	55	0	
Conf. Peds. (#/hr)	70	135	135	70	120	70	120	50	50	50	120	120	
Conf. Bikes (#/hr)		5			30								
Heavy Vehicles (%)	13%	7%	14%	9%	8%	3%	11%	3%	10%	0%	3%	10%	
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	
Protected Phases	2.9			6.10			8				4		
Permitted Phases	2.9			6.10			8				4		
Actuated Green, G (s)	70.0			70.0			21.1				21.1		
Effective Green, g (s)	71.0			71.0			22.1				22.1		
Actuated q/C Ratio	0.72			0.72			0.22				0.22		
Clearance Time (s)							6.0				6.0		
Vehicle Extension (s)							3.0				3.0		
Lane Grp Cap (vph)	1164			1126			304				251		
v/s Ratio Prot													
v/s Ratio Perm	0.35			0.33			0.06				0.05		
v/c Ratio	0.48			0.47			0.25				0.22		
Uniform Delay, d1	6.1			6.0			31.7				31.4		
Progression Factor	1.00			1.00			1.00				1.00		
Incremental Delay, d2	0.3			0.3			0.4				0.4		
Delay (s)	6.4			6.3			32.2				31.9		
Level of Service	A			A			C				C		
Approach Delay (s)	6.4			6.3			32.2				31.9		
Approach LOS	A			A			C				C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	10.2											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44												
Actuated Cycle Length (s)	99.1											Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.9%											ICU Level of Service	B
Analysis Period (min)	15												
c Critical Lane Group													

25: Tubman Avenue & Dundas Street E

2032 Future Total AM Model (Sensitivity)

04-04-2023

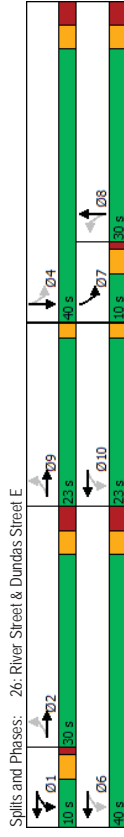
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	560	15	5	480	0	0	0	0	40	0	5
Future Volume (Veh/h)	0	560	15	5	480	0	0	0	0	40	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	622	17	6	533	0	0	0	0	44	0	6
Pedestrians	5			5			115			45		
Lane Width (m)	3.5			3.5			0.0			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			4		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	99			98								
pX platoon unblocked	0.83			0.87			0.90	0.90	0.87	0.90	0.90	0.83
VC, conflicting volume	578			754			1302	1336	750	1226	1344	583
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	392			640			948	985	636	863	995	398
IC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
IC, 2 stage (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	81	100	99
CM capacity (veh/h)	941			827			207	214	416	229	211	522
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	639	539	50									
Volume Left	0	6	44									
Volume Right	17	0	6									
cSH	941	827	246									
Volume to Capacity	0.00	0.01	0.20									
Queue Length 95th (m)	0.0	0.2	5.6									
Control Delay (s)	0.0	0.2	23.3									
Lane LOS	A	A	C									
Approach Delay (s)	0.0	0.2	23.3									
Approach LOS	C	C	C									
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			47.1%									A
Analysis Period (min)			15									

26: River Street & Dundas Street E

2032 Future Total AM Model (Sensitivity)

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	515	110	325	70	330	145	440				
Future Volume (vph)	15	515	110	325	70	330	145	440				
Turn Type	Perm	NA	custom	NA	Perm	NA	prh+pl	NA				
Protected Phases	2 9	1	1 6 10	8	7	4	2	6	9	10		
Permitted Phases	2	2	1	1 6	8	8	7	4				
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0			21.0			5.0	21.0	21.0	21.0	5.0	5.0
Minimum Split (s)	10.0			27.0			9.0	27.0	27.0	27.0	23.0	23.0
Total Split (s)	30.0			30.0			30.0	30.0	30.0	30.0	40.0	23.0
Total Split (%)	9.7%			29.1%			9.7%	38.8%	29%	39%	22%	22%
Yellow Time (s)	3.0			3.0			3.0	3.0	3.0	3.0	2.0	2.0
All-Red Time (s)	1.0			3.0			3.0	3.0	3.0	3.0	0.0	0.0
Lost Time Adjust (s)	-1.0			-1.0			-1.0	-1.0	-1.0	-1.0	0.0	0.0
Total Lost Time (s)				5.0			5.0	5.0	5.0	5.0		
Lead/Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	None	None	None	None		
Act Effct Green (s)	29.0			41.2			25.3	25.3	37.4	35.4		
Actuated g/C Ratio	0.34			0.49			0.30	0.30	0.44	0.42		
v/c Ratio	1.11			0.88			0.52	1.00	0.70	0.84		
Control Delay	99.3			35.9			43.4	70.9	37.1	36.4		
Queue Delay	0.0			0.0			0.0	0.0	0.0	0.0		
Total Delay	99.3			35.9			43.4	70.9	37.1	36.4		
LOS	F			D			D	E	D	D		
Approach Delay	99.3			35.9			67.4	36.6				
Approach LOS	F			D			E	D				
Intersection Summary												
Cycle Length: 103												
Actuated Cycle Length: 84.6												
Natural Cycle: 100												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 1.11												
Intersection Signal Delay: 60.0												
Intersection Capacity Utilization: 122.3%												
Analysis Period (min): 15												



Queues 2032 Future Total AM Model (Sensitivity) 04-04-2023

HCM Signalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity) 04-04-2023

26: River Street & Dundas Street E

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group						
Lane Group Flow (vph)	638	516	74	495	154	564
v/c Ratio	1.11	0.88	0.52	1.00	0.70	0.84
Control Delay	99.3	35.9	43.4	70.9	37.1	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	35.9	43.4	70.9	37.1	36.4
Queue Length 50th (m)	-120.6	56.3	9.1	70.6	13.3	70.2
Queue Length 95th (m)	#169.5	82.9	#35.2	#181.2	#51.7	#184.6
Internal Link Dist (m)	73.4	80.5		131.0		118.9
Turn Bay Length (m)			20.0		25.0	
Base Capacity (vph)	575	585	142	497	220	672
Station Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.88	0.52	1.00	0.70	0.84
<b>Intersection Summary</b>						
-	Volume exceeds capacity, queue is theoretically infinite.					
-	Queue shown is maximum after two cycles.					
#	95th percentile volume exceeds capacity, queue may be longer.					
-	Queue shown is maximum after two cycles.					

26: River Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	515	70	110	325	50	70	330	135	145	440	90
Future Volume (vph)	15	515	70	110	325	50	70	330	135	145	440	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0											
Lane Util. Factor	1.00											
Flpb. ped/bikes	0.98											
Flpb. psd/bikes	1.00											
Flt	0.98											
Flt Protected	1.00											
Satd. Flow (prot)	1691											
Flt Permitted	0.98											
Satd. Flow (perm)	1664											
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	548	74	117	346	53	74	351	144	154	468	96
RTOR Reduction (vph)	0	5	0	0	5	0	0	13	0	0	6	0
Lane Group Flow (vph)	0	633	0	0	511	0	74	482	0	154	558	0
Conf. Peds. (#/hr)	65	90	90	90	90	90	65	65	45	45	65	15
Conf. Bikes (#/hr)												
Heavy Vehicles (%)	0%	7%	4%	3%	7%	0%	9%	9%	1%	5%	12%	7%
Turn Type	Perm	NA	NA	custom	NA	NA	Perm	NA	NA	pm+pl	NA	NA
Protected Phases	2,9			1,6,10				8		7		4
Permitted Phases	2,9			6,10			8			4		4
Actuated Green, G (s)	33.6			43.7			24.2	24.2		34.3		34.3
Effective Green, g (s)	34.6			39.7			25.2	25.2		35.3		35.3
Actuated g/C Ratio	0.40			0.46			0.29	0.29		0.41		0.41
Clearance Time (s)							6.0	6.0		4.0		6.0
Vehicle Extension (s)							3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	669			553			139	477		211		657
v/s Ratio Prot				c0.08			c0.30			0.06		c0.35
v/s Ratio Perm	c0.38			0.35			0.16			0.24		0.24
v/c Ratio	0.95			0.92			0.53	1.01		0.73		0.85
Uniform Delay, d1	24.8			21.7			25.5	30.4		19.6		22.9
Progression Factor	1.00			1.00			1.00	1.00		1.00		1.00
Incremental Delay, d2	22.2			21.2			3.9	43.6		11.9		10.0
Delay (s)	47.0			42.9			29.3	74.0		31.5		32.9
Level of Service	D			D			C	E		C		C
Approach Delay (s)	47.0			42.9			68.2			32.6		
Approach LOS	D			D			E			C		C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	46.8 HCM 2000 Level of Service D											
HCM 2000 Volume to Capacity ratio	1.01											
Actuated Cycle Length (s)	86.0 Sum of lost time (s) 17.0											
Intersection Capacity Utilization	122.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 27: Dreamer's Way & Gerrard Street E

04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR	Diagram
Lane Configurations	4+4			4+4			
Traffic Volume (veh/h)	345	30	5	830	0	0	
Future Volume (Veh/h)	345	30	5	830	0	0	
Sign Control	Free	Free	Free	Stop	Stop	Stop	
Grade	0%	0%	0%	0%	0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	383	33	6	922	0	0	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)	None			None			
Median type							
Median storage (veh)	88			164			
Upstream signal (m)	0.97			0.89		0.97	
pX platoon unblocked	416			872		208	
VC, conflicting volume							
VC1, stage 1 conf vol							
VC2, stage 2 conf vol							
VCu, unblocked vol	341			481		127	
IC, single (s)	4.1			6.8		6.9	
IC, 2 stage (s)							
p0 queue free %	2.2			3.5		3.3	
IF (s)	99			100		100	
CM capacity (veh/h)	1195			462		880	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	
Volumes Total	255	161	313	615			
Volume Left	0	0	6	0			
Volume Right	0	33	0	0			
cSH	1700	1700	1195	1700			
Volumes to Capacity	0.15	0.09	0.01	0.36			
Queue Length 95th (m)	0.0	0.0	0.1	0.0			
Control Delay (s)	0.0	0.0	0.2	0.0			
Lane LOS	A	A	A	A			
Approach Delay (s)	0.0		0.1				
Approach LOS			A				
Intersection Summary							
Average Delay	0.0						
Intersection Capacity Utilization	29.8%						ICU Level of Service
Analysis Period (min)	15						A

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 28: Dreamer's Way & Site Drive

04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT	Diagram
Lane Configurations	4				4		
Traffic Volume (veh/h)	25	0	0	0	5	30	
Future Volume (Veh/h)	25	0	0	0	5	30	
Sign Control	Stop	Free	Free	Free	Free	Free	
Grade	0%	0%	0%	0%	0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	28	0	0	0	6	33	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)	None			None		None	
Median type							
Median storage (veh)							
Upstream signal (m)							
pX platoon unblocked							
VC, conflicting volume	45			0		0	
VC1, stage 1 conf vol							
VC2, stage 2 conf vol							
VCu, unblocked vol	45			0		0	
IC, single (s)	6.4			6.2		4.1	
IC, 2 stage (s)							
p0 queue free %	3.5			3.3		2.2	
IF (s)	97			100		100	
CM capacity (veh/h)	967			1091		1636	
Direction, Lane #	WB 1	WB 1	SB 1	SB 1			
Volumes Total	28			39			
Volume Left	28			6			
Volume Right	0			0			
cSH	967			1636			
Volumes to Capacity	0.03			0.00			
Queue Length 95th (m)	0.7			0.1			
Control Delay (s)	8.8			1.1			
Lane LOS	A			A			
Approach Delay (s)	8.8			1.1			
Approach LOS	A			A			
Intersection Summary							
Average Delay	4.4						
Intersection Capacity Utilization	13.3%						ICU Level of Service
Analysis Period (min)	15						A



HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 29: Sumach Street & Site Driveway

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	0	0	0	80	0	100	25	0	0	0
Future Volume (Veh/h)	35	0	0	0	0	80	0	100	25	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	0	0	0	0	89	0	111	28	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (m)												57
pX platoon unblocked												
VC, conflicting volume	214	139	0	125	125	125	0	139				
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	214	139	0	125	125	125	0	139				
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	94	100	100	100	100	90	100	100				
CM capacity (veh/h)	676	756	1091	854	769	931	1636	1457				
Direction, Lane #	EB 1	WB 1	NB 1									
Volumes Total	39	89	139									
Volume Left	39	0	0									
Volume Right	0	89	28									
cSH	676	931	1636									
Volumes to Capacity	0.06	0.10	0.00									
Queue Length 95th (m)	1.4	2.4	0.0									
Control Delay (s)	10.7	9.3	0.0									
Lane LOS	B	A	A									
Approach Delay (s)	10.7	9.3	0.0									
Approach LOS	B	A	A									
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			22.1%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 30: Street 'J' & Site Laneway

04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	0	0	0	5	45
Future Volume (Veh/h)	70	0	0	0	5	45
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	78	0	0	0	6	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	62	0	0	0	0	0
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	62	0	0	0	0	0
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	92	100			100	
CM capacity (veh/h)	946	1091			1636	
Direction, Lane #	WB 1	SB 1				
Volumes Total	78	56				
Volume Left	78	6				
Volume Right	0	0				
cSH	946	1636				
Volumes to Capacity	0.08	0.00				
Queue Length 95th (m)	2.0	0.1				
Control Delay (s)	9.1	0.8				
Lane LOS	A	A				
Approach Delay (s)	9.1	0.8				
Approach LOS	A	A				
Intersection Summary						
Average Delay			5.7			
Intersection Capacity Utilization			13.9%			
Analysis Period (min)			15			
ICU Level of Service						A

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 31: Street 'G' & Gerrard Street E 04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	355	0	0	895	0	10
Future Volume (Veh/h)	355	0	0	895	0	10
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	394	0	0	994	0	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)	169			83		
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume		394		891		197
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol		394		524		197
IC, single (s)		4.1		6.8		6.9
IC, 2 stage (s)						
p0 queue free %		2.2		3.5		3.3
IF (s)		100		100		99
CM capacity (veh/h)		1176		415		817
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volumes Total	197	197	497	497	11	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	11	
cSH	1700	1700	1700	1700	817	
Volumes to Capacity	0.12	0.12	0.29	0.29	0.01	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	
Control Delay (s)	0.0	0.0	0.0	0.0	9.5	
Lane LOS	A	A	A	A	A	
Approach Delay (s)	0.0	0.0	0.0	9.5		
Approach LOS				A		
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	28.1%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total AM Model (Sensitivity)  
 32: Oak Street & Street 'G' 04-04-2023

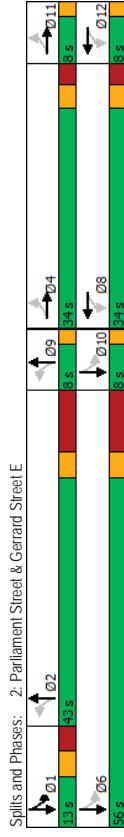
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔	↔	↔
Traffic Volume (veh/h)	10	45	95	0	0	0
Future Volume (Veh/h)	10	45	95	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	50	106	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None		None			
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume		106		178		106
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol		106		178		106
IC, single (s)		4.1		6.4		6.2
IC, 2 stage (s)						
p0 queue free %		2.2		3.5		3.3
IF (s)		99		100		100
CM capacity (veh/h)		1488		810		954
Direction, Lane #	EB 1	WB 1				
Volumes Total	61	106				
Volume Left	11	0				
Volume Right	0	0				
cSH	1488	1700				
Volumes to Capacity	0.01	0.06				
Queue Length 95th (m)	0.2	0.0				
Control Delay (s)	1.4	0.0				
Lane LOS	A	A				
Approach Delay (s)	1.4	0.0				
Approach LOS						
Intersection Summary						
Average Delay	0.5					
Intersection Capacity Utilization	12.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

04-04-2023  
 HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 1: Parliament Street & Gerrard Street E (North Section)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				4A	4A	
Traffic Volume (veh/h)	0	0	10	520	600	75
Future Volume (Veh/h)	0	0	10	520	600	75
Sign Control	Stop					
Grade	0%					
Peak Hour Factor	0.89					
Hourly flow rate (vph)	0	0	11	584	674	84
Pedestrians	150					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)	None					
Median type	None					
Median storage (veh)	None					
Upstream signal (m)	39					
pX platoon unblocked	1190					
VC, conflicting volume	534					
VC1, stage 1 conf vol	908					
VC2, stage 2 conf vol	1190					
VCU, unblocked vol	534					
IC, single (s)	6.8					
IC, 2 stage (s)	3.5					
p0 queue free %	100					
IF (s)	179					
CM capacity (veh/h)	494					
Direction, Lane #	NB 1		NB 2		SB 2	
Volumes Total	206		389		449	
Volume Left	11		0		0	
Volume Right	0		0		84	
cSH	692		1700		1700	
Volumes to Capacity	0.02		0.23		0.26	
Queue Length 95th (m)	0.4		0.0		0.0	
Control Delay (s)	0.7		0.0		0.0	
Lane LOS	A		A		A	
Approach Delay (s)	0.3		0.0		0.0	
Approach LOS	A		A		A	
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	33.0%					
Analysis Period (min)	15					
ICU Level of Service	A					

04-04-2023  
 2032 Future Total PM Model (Sensitivity)  
 2: Parliament Street & Gerrard Street E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø4	Ø6	Ø8
Lane Configurations		4TB		4TB		4TB		4TB				
Traffic Volume (vph)	30	570	40	260	80	360	255	275				
Future Volume (vph)	30	570	40	260	80	360	255	275				
Turn Type	Perm	NA	Perm	NA	Perm	NA	custom	NA				
Protected Phases	4 11											
Permitted Phases	4 4 4 8 8 8 2 2 2 1 1 6											
Switch Phase	4 4 4 8 8 8 2 2 2 1 1 6											
Minimum Initial (s)	6.0											
Minimum Split (s)	12.5											
Total Split (s)	13.0											
Total Split (%)	12.3%											
Yellow Time (s)	3.3											
All-Red Time (s)	3.2											
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead Lag											
Recall Mode	Yes Yes											
Act Effct Green (s)	33.2											
Actuated g/C Ratio	0.34											
w/C Ratio	0.65											
Control Delay	30.7											
Queue Delay	0.0											
Total Delay	30.7											
LOS	C											
Approach Delay	30.7											
Approach LOS	C											
Intersection Summary												
Cycle Length: 106												
Actuated Cycle Length: 98												
Natural Cycle: 95												
Control Type: Actuated-Uncoordinated												
Maximum w/C Ratio: 0.84												
Intersection Signal Delay: 27.9												
Intersection Capacity Utilization 101.0%												
Analysis Period (min) 15												



Timings  
2: Parliament Street & Gerrard Street E

Queues  
2: Parliament Street & Gerrard Street E

2032 Future Total PM Model (Sensitivity)  
04-04-2023

2032 Future Total PM Model (Sensitivity)  
04-04-2023

Lane Group	Ø9	Ø10	Ø11	Ø12
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Turn Type	9	10	11	12
Protected Phases				
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	5.0
Minimum Split (s)	8.0	8.0	8.0	8.0
Total Split (s)	8.0	8.0	8.0	8.0
Total Split (%)	8%	8%	8%	8%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Intersection Summary				

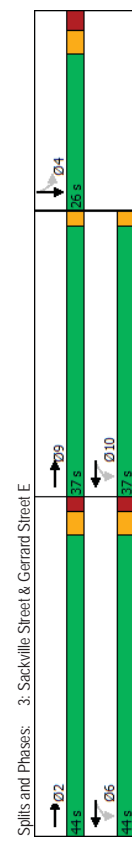
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	696	453	618	619
v/c Ratio	0.65	0.49	0.84	0.55
Control Delay	30.7	23.4	41.7	14.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.7	23.4	41.7	14.4
Queue Length 50th (m)	61.2	31.0	56.5	32.7
Queue Length 95th (m)	80.7	45.7	#86.7	45.2
Internal Link Dist (m)	33.0	65.6	119.2	15.0
Turn Bay Length (m)				
Base Capacity (vph)	1087	913	811	1184
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	0.64	0.50	0.76	0.52
Intersection Summary				
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.				

2. Parliament Street & Gerrard Street E 2032 Future Total PM Model (Sensitivity) 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4TB		4TB			4TB				4TB	
Traffic Volume (vph)	30	570	75	40	260	140	80	360	160	255	275	70
Future Volume (vph)	30	570	75	40	260	140	80	360	160	255	275	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)		4.8		4.8			10.2				5.5	
Lane Util. Factor		0.95		0.95			0.95				0.95	
Frbp. ped/bikes		0.98		0.95			0.92				0.99	
Frbp. ped/bikes		1.00		1.00			0.99				0.97	
Frt		0.98		0.95			0.96				0.98	
Frt Protected		1.00		1.00			0.99				0.98	
Sat'd. Flow (prot)		3397		3100			3022				3173	
FIL Permitted		0.92		0.82			0.75				0.58	
Sat'd. Flow (perm)		3116		2560			2281				1870	
Peak-hour factor, PHF		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)		31	588	77	41	268	144	82	371	165	263	284
RTOR Reduction (vph)		0	9	0	0	50	0	0	27	0	0	11
Lane Group Flow (vph)		0	687	0	0	403	0	0	591	0	0	608
Confl. Peds. (#/hr)		130	120	120	130	125	235	235	235	15	15	5
Heavy Vehicles (%)		10%	0%	5%	0%	0%	10%	4%	2%	2%	6%	4%
Turn Type	Perim	MA	MA	Perm	MA	Perm	NA	NA	custom	MA	MA	MA
Protected Phases		4 11		8 12		2 9				1 6 10		
Permitted Phases		4 11		8 12		2 9				6 10		
Actuated Green, G (s)		36.5		36.5		45.1				58.2		
Effective Green, g (s)		37.5		37.5		46.1				49.0		
Actuated g/C Ratio		0.38		0.38		0.47				0.50		
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		1183		972		1065				1028		
v/s Ratio Prot		c0.22		0.16		0.26				c0.25		
v/s Ratio Perm		0.58		0.42		0.55				0.59		
v/c Ratio		24.3		22.5		18.9				17.7		
Uniform Delay, d1		1.00		1.00		1.00				1.00		
Progression Factor		0.7		0.3		0.6				0.9		
Incremental Delay, d2		25.1		22.8		19.5				18.6		
Delay (s)		C		C		B				B		
Level of Service		C		C		B				B		
Approach Delay (s)		25.1		22.8		19.5				18.6		
Approach LOS		C		C		B				B		
Intersection Summary												
HCM 2000 Control Delay		21.5		HCM 2000 Level of Service		C						
HCM 2000 Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		98.7		Sum of lost time (s)		22.5						
Intersection Capacity Utilization		101.0%		ICU Level of Service		G						
Analysis Period (min)		15										
c Critical Lane Group												

3. Sackville Street & Gerrard Street E 2032 Future Total PM Model (Sensitivity) 04-04-2023

Lane Group	EBT	WBL	WBT	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	4TB		4TB					
Traffic Volume (vph)	950	95	555	40				
Future Volume (vph)	950	95	555	40				
Turn Type	NA	Perm	NA	NA				
Protected Phases	2 9		6 10	4 2	6	9	10	
Permitted Phases			6 10					
Detector Phase	2	6	6	4				
Switch Phase								
Minimum Initial (s)			20.0	16.0	16.0	5.0	5.0	
Minimum Split (s)			25.7	21.0	21.0	37.0	37.0	
Total Split (s)			26.0	44.0	44.0	37.0	37.0	
Total Spill (%)			24.3%	41%	41%	35%	35%	
Yellow Time (s)			3.0	3.0	3.0	2.0	2.0	
All-Red Time (s)			2.7	2.0	2.0	0.0	0.0	
Lost Time Adjust (s)			-1.0					
Total Lost Time (s)			4.7					
Lead-Lag								
Lead-Lag Optimize?								
Recall Mode			Min	Min	None	None	None	
Ad. Effct Green (s)			40.8	21.7				
Actuated g/C Ratio			0.57	0.57	0.30			
v/c Ratio			0.57	0.52	0.42			
Control Delay			10.1	10.2	25.8			
Queue Delay			0.0	0.0	0.0			
Total Delay			10.1	10.2	25.8			
LOS			B	B	C			
Approach Delay			10.1	10.2	25.8			
Approach LOS			B	B	C			
Intersection Summary								
Cycle Length: 107								
Actuated Cycle Length: 71.4								
Natural Cycle: 85								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.57								
Intersection Signal Delay: 11.8								
Intersection Capacity Utilization: 76.9%								
Analysis Period (min): 15								



Queues  
3. Sackville Street & Gerrard Street E

2032 Future Total PM Model (Sensitivity)  
04-04-2023

	→	←	←	→
Lane Group	EBT	WBT	SBT	SBT
Lane Group Flow (vph)	1089	677	209	
v/c Ratio	0.57	0.52	0.42	
Control Delay	10.1	10.2	25.8	
Queue Delay	0.0	0.0	0.0	
Total Delay	10.1	10.2	25.8	
Queue Length 50th (m)	41.3	25.3	23.1	
Queue Length 95th (m)	55.4	36.6	48.4	
Internal Link Dist (m)	57.2	47.8	15.3	
Turn Bay Length (m)				
Base Capacity (vph)	2153	1479	503	
Starvation Cap Reductn	0	0	0	
Spillback Cap Reductn	0	0	0	
Storage Cap Reductn	0	0	0	
Reduced v/c Ratio	0.51	0.46	0.42	
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
3. Sackville Street & Gerrard Street E

2032 Future Total PM Model (Sensitivity)  
04-04-2023

	→	←	←	→								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4↑	4↑		4↑						4↑	4↑
Traffic Volume (vph)	0	950	95	95	555	0	0	0	0	0	135	40
Future Volume (vph)	0	950	95	95	555	0	0	0	0	0	135	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5
Total Lost time (s)		4.0		4.0							4.7	
Lane Util. Factor		0.95		0.95							1.00	
Frbp. ped/bikes		0.98		1.00							0.99	
Frbp. psd/bikes		1.00		1.00							0.98	
Frt		0.99		1.00							0.97	
Flt Protected		3364		3359							1674	
Satd. Flow (prot)		1.00		0.68							0.97	
Flt Permitted		3364		2301							1674	
Satd. Flow (perm)		0.96		0.96							0.96	
Peak-hour factor, PHF		0.990		0.99							0.96	
Adj. Flow (vph)		0		99							42	
RTOR Reduction (vph)		0		0							0	
Lane Group Flow (vph)		0	1079	0	677	0	0	0	0	0	205	0
Confl. Peds. (#/hr)		85	70	70	85	90	60	60	60	60	90	10
Confl. Bikes (#/hr)		0	60	60	15	5	5	5	5	5	10	10
Heavy Vehicles (%)		0%	3%	0%	0%	6%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2.9		6.10						4		
Permitted Phases				6.10								4
Actuated Green, G (s)		43.2		43.2							20.6	
Effective Green, g (s)		44.2		44.2							21.6	
Actuated g/C Ratio		0.62		0.62							0.30	
Clearance Time (s)											5.7	
Vehicle Extension (s)											3.0	
Lane Grp Cap (vph)		2079		1422							505	
v/s Ratio Prot		c0.32										
v/s Ratio Perm		0.52		0.29							0.12	
v/c Ratio		7.7		7.4							19.8	
Uniform Delay, d1		1.00		1.00							1.00	
Progression Factor		0.2		0.3							0.5	
Incremental Delay, d2		7.9		7.6							20.4	
Delay (s)		A		A							C	
Level of Service		7.9		7.6							20.4	
Approach Delay (s)		A		A							C	
Approach LOS		A		A							C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		9.1		HCM 2000 Level of Service							A	
HCM 2000 Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		71.5		Sum of lost time (s)							9.7	
Intersection Capacity Utilization		76.9%		ICU Level of Service							D	
Analysis Period (min)		15										
c Critical Lane Group												



HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 4: Gerrard Street E & Gifford Street

04-04-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4A	4B		W	
Traffic Volume (veh/h)	10	1075	645	5	15	5
Future Volume (Veh/h)	10	1075	645	5	15	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	1265	759	6	18	6
Pedestrians		5			65	
Lane Width (m)		3.5		3.0		
Walking Speed (m/s)		1.1		1.1		
Percent Blockage		0			5	
Right turn flare (veh)		None		None		
Median type		None		None		
Median storage (veh)						
Upstream signal (m)		72	141			
pX platoon unblocked	0.96			0.85	0.96	
VC, conflicting volume	830			1484	452	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	736			990	342	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
p0 queue free %	2.2			3.5	3.3	
IF (s)	99			91	99	
CM capacity (veh/h)	801			196	599	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volumes Total	434	843	506	259	24	
Volume Left	12	0	0	0	18	
Volume Right	0	0	0	6	6	
cSH	801	1700	1700	1700	236	
Volumes to Capacity	0.01	0.50	0.30	0.15	0.10	
Queue Length 95th (m)	0.3	0.0	0.0	0.0	2.6	
Control Delay (s)	0.4	0.0	0.0	0.0	22.0	
Lane LOS	A				C	
Approach Delay (s)	0.2		0.0		22.0	
Approach LOS					C	
<b>Intersection Summary</b>						
Average Delay				0.4		
Intersection Capacity Utilization	48.3%			ICU Level of Service		A
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 5: Gerrard Street E & Nasmith Avenue

04-04-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4A	4B		W	
Traffic Volume (veh/h)	5	1085	645	5	5	5
Future Volume (Veh/h)	5	1085	645	5	5	5
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	1247	741	6	6	6
Pedestrians					60	
Lane Width (m)		3.0		3.0		
Walking Speed (m/s)		1.1		1.1		
Percent Blockage					5	
Right turn flare (veh)		None		None		
Median type		None		None		
Median storage (veh)						
Upstream signal (m)		145	68			
pX platoon unblocked	0.94			0.88	0.94	
VC, conflicting volume	807			1440	434	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	655			889	255	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
p0 queue free %	99			97	99	
IF (s)	2.2			3.5	3.3	
CM capacity (veh/h)	841			238	669	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volumes Total	422	831	494	253	12	
Volume Left	6	0	0	0	6	
Volume Right	0	0	0	6	6	
cSH	841	1700	1700	1700	351	
Volumes to Capacity	0.01	0.49	0.29	0.15	0.03	
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.8	
Control Delay (s)	0.2	0.0	0.0	0.0	15.6	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		15.6	
Approach LOS					C	
<b>Intersection Summary</b>						
Average Delay				0.1		
Intersection Capacity Utilization	43.5%			ICU Level of Service		A
Analysis Period (min)	15					

Timings 2032 Future Total PM Model (Sensitivity) 04-04-2023

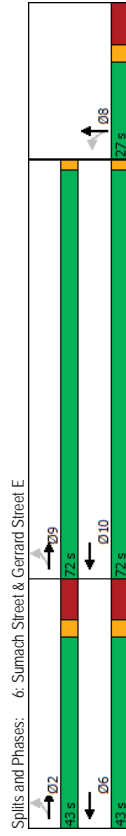
Queues 2032 Future Total PM Model (Sensitivity) 04-04-2023

6: Summach Street & Gerrard Street E

6: Summach Street & Gerrard Street E

Lane Group	EBL	EBT	WBT	NBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations								
Traffic Volume (vph)	10	1080	590	25				
Future Volume (vph)	10	1080	590	25				
Turn Type	Perm	NA	NA	NA				
Protected Phases	2 9	2 9	6 10	8	2	6	9	10
Permitted Phases	2 9	2 9	6 10	8				
Detector Phase								
Switch Phase								
Minimum Initial (s)					15.0	11.0	5.0	5.0
Minimum Split (s)					25.4	26.2	72.0	72.0
Total Split (s)					27.0	43.0	72.0	72.0
Total Split (%)					19.0%	30%	51%	51%
Yellow Time (s)					3.0	3.0	2.0	2.0
All-Red Time (s)					7.4	7.2	0.0	0.0
Lost Time Adjust (s)					-1.0			
Total Lost Time (s)					9.4			
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode					None	Min	None	None
Act Effct Green (s)		56.2	56.2	17.2				
Actuated g/C Ratio		0.61	0.61	0.19				
v/c Ratio		0.56	0.36	0.64				
Control Delay		11.6	8.8	41.2				
Queue Delay		0.0	0.0	0.0				
Total Delay		11.6	8.8	41.2				
LOS		B	A	D				
Approach Delay		11.6	8.8	41.2				
Approach LOS		B	A	D				
Intersection Summary								
Cycle Length: 142								
Actuated Cycle Length: 92.3								
Natural Cycle: 125								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.64								
Intersection Signal Delay: 13.5								
Intersection Capacity Utilization: 71.8%								
Analysis Period (min): 15								

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	1123	696	196
v/c Ratio	0.56	0.36	0.64
Control Delay	11.6	8.8	41.2
Queue Delay	0.0	0.0	0.0
Total Delay	11.6	8.8	41.2
Queue Length 50th (m)	57.1	28.2	29.3
Queue Length 95th (m)	72.2	37.7	#58.6
Internal Link Dist (m)	44.0	75.7	30.7
Turn Bay Length (m)			
Base Capacity (vph)	3211	3030	317
Starvation Cap Reductn	258	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.38	0.23	0.62
Intersection Summary			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			



6: Sumach Street & Gerrard Street E  
 HCM Signalized Intersection Capacity Analysis  
 2032 Future Total PM Model (Sensitivity)  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4			4+4			4+4				
Traffic Volume (vph)	10	1080	0	0	590	85	60	25	105	0	0	0
Future Volume (vph)	10	1080	0	0	590	85	60	25	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.5	3.0
Total Lost time (s)	9.2			9.2			9.4					
Lane Util. Factor	0.95			0.95			1.00					
Frbp, ped/bikes	1.00			0.96			0.96					
Frbp, ped/bikes	1.00			1.00			0.95					
Frt	1.00			0.98			0.93					
Flt Protected	1.00			1.00			0.98					
Sat'd. Flow (prot)	3496			3255			1560					
Flt Permitted	0.95			1.00			0.98					
Sat'd. Flow (perm)	3312			3255			1560					
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	10	1113	0	0	608	88	62	26	108	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1123	0	0	687	0	0	167	0	0	0	0
Confl. Peds. (#/hr)	95	95	95	95	95	80	35	35	35	35	80	80
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Permi	MA	NA	NA	Permi	NA	Permi	NA	NA	NA	NA	NA
Protected Phases	2.9			6.10			8					
Permitted Phases	2.9			6.10			8					
Effective Green, G (s)	63.4			63.4			16.2					
Actuated Green, g (s)	64.4			64.4			17.2					
Actuated g/C Ratio	0.70			0.70			0.19					
Clearance Time (s)							10.4					
Vehicle Extension (s)							3.0					
Lane Grp Cap (vph)	2318			2278			291					
v/s Ratio Prot				0.21								
v/s Ratio Perm	60.34			0.30			0.11					
v/c Ratio	0.48			0.30			0.57					
Uniform Delay, d1	6.3			5.2			34.1					
Progression Factor	1.00			1.00			1.00					
Incremental Delay, d2	0.2			0.1			2.7					
Delay (s)	6.4			5.3			36.8					
Level of Service	A			A			D					
Approach Delay (s)	6.4			5.3			36.8					0.0
Approach LOS	A			A			D					A
Intersection Summary												
HCM 2000 Control Delay	9.0 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	92.0 Sum of lost time (s)											
Intersection Capacity Utilization	71.8% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

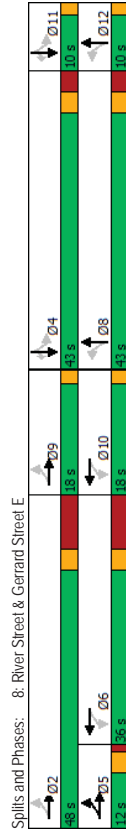
7: Street J/Sword Street & Gerrard Street E  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total PM Model (Sensitivity)  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4+4			4+4			4+4				
Traffic Volume (veh/h)	0	1130	55	45	665	0	0	0	0	15	0	10
Future Volume (Veh/h)	0	1130	55	45	665	0	0	0	0	15	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	0%	0%	0%	0%
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1256	61	50	739	0	0	0	0	17	0	11
Pedestrians												65
Lane Width (m)												3.0
Walking Speed (m/s)												1.1
Percent Blockage												5
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	100			91								
pX platoon unblocked	0.93			0.86			0.89	0.89	0.86	0.89	0.89	0.93
vC, conflicting volume	804			1317			1767	2190	658	1532	2221	434
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	636			1032			1257	1733	262	993	1767	239
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.1
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.4
p0 queue free %	100			91			100	100	100	89	100	98
dM capacity (veh/h)	845			582			102	69	635	154	65	658
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1							
Volumes Total	837	480	296	493	28							
Volume Left	0	0	50	0	17							
Volume Right	0	61	0	0	11							
CSH	1700	1700	582	1700	221							
Volumes to Capacity	0.49	0.28	0.09	0.29	0.13							
Queue Length 95th (m)	0.0	0.0	2.1	0.0	3.3							
Control Delay (s)	0.0	0.0	3.0	0.0	23.7							
Lane LOS	A		A		C							
Approach Delay (s)	0.0		1.1		23.7							
Approach LOS			C		C							
Intersection Summary												
Average Delay	0.7											
Intersection Capacity Utilization	62.3% ICU Level of Service											
Analysis Period (min)	15											

Timings  
8: River Street & Gerrard Street E

2032 Future Total PM Model (Sensitivity)  
04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø2	Ø4	Ø6
Lane Configurations	EBT	EBT	WBT	WBT	NBT	NBT	SBT	SBT	SBR	Ø2	Ø4	Ø6
Traffic Volume (vph)	220	855	85	390	110	345	165	450	210			
Future Volume (vph)	220	855	85	390	110	345	165	450	210			
Turn Type	custom	NA	Perm	NA	Perm	NA	Perm	NA	Perm			
Protected Phases	5	5	2	9	6	10	8	12	4	11	2	4
Permitted Phases	5	5	2	9	6	10	8	12	4	11	2	4
Detector Phase												
Switch Phase												
Minimum Initial (s)	6.0									23.0	19.0	23.0
Minimum Split (s)	10.0									33.8	30.0	33.8
Total Split (s)	12.0									48.0	43.0	36.0
Total Split (%)	10.1%									40%	36%	30%
Yellow Time (s)	3.0									3.0	3.0	3.0
All-Red Time (s)	1.0									7.8	3.0	7.8
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None									Min	Min	Min
Act Effct Green (s)	55.6									39.4	39.4	39.4
Actuated g/C Ratio	0.54									0.38	0.38	0.38
v/c Ratio	0.90									1.00	0.66	0.32
Control Delay	30.4									36.9	104.4	32.8
Queue Delay	19.0									0.0	0.0	0.0
Total Delay	49.4									36.9	104.4	32.8
LOS	D									D	F	C
Approach Delay	49.4									37.4	39.9	39.9
Approach LOS	D									D	D	D
Intersection Summary												
Cycle Length	119											
Actuated Cycle Length	103.1											
Natural Cycle	105											
Control Type	Actuated-Uncoordinated											
Maximum v/c Ratio	1.00											
Intersection Signal Delay	45.5											
Intersection Capacity Utilization	116.4%											
Analysis Period (min)	15											



Timings  
8: River Street & Gerrard Street E

2032 Future Total PM Model (Sensitivity)  
04-04-2023

Lane Group	Ø8	Ø9	Ø10	Ø11	Ø12
Lane Configurations					
Traffic Volume (vph)					
Future Volume (vph)					
Turn Type					
Protected Phases	8	9	10	11	12
Permitted Phases					
Detector Phase					
Switch Phase					
Minimum Initial (s)	19.0	5.0	5.0	5.0	5.0
Minimum Split (s)	30.0	18.0	18.0	10.0	10.0
Total Split (s)	43.0	18.0	18.0	10.0	10.0
Total Split (%)	36%	15%	15%	8%	8%
Yellow Time (s)	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	None	None	None	None
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Intersection Summary					

Queues 8: River Street & Gerrard Street E 2032 Future Total PM Model (Sensitivity) 04-04-2023

	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	1193	604	115	526	172	469	219
Lane Group Flow (vph)	0.90	0.94	0.56	0.77	1.00	0.66	0.32
v/c Ratio	30.4	54.2	39.4	36.9	104.4	32.8	4.5
Control Delay	19.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	49.4	54.2	39.4	36.9	104.4	32.8	4.5
Total Delay	81.2	57.0	20.1	98.3	-41.3	86.1	0.0
Queue Length 50th (m)	#139.3	#101.7	40.6	140.6	#82.9	121.3	14.6
Queue Length 95th (m)	67.0	81.6	126.5			61.7	
Internal Link Dist (m)			30.0				
Turn Bay Length (m)	1324	645	211	693	176	726	688
Base Capacity (vph)	164	0	0	0	0	0	0
Station Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.94	0.55	0.76	0.98	0.65	0.32
<b>Intersection Summary</b>							
-	Volume exceeds capacity, queue is theoretically infinite.						
-	Queue shown is maximum after two cycles.						
#	95th percentile volume exceeds capacity, queue may be longer.						
-	Queue shown is maximum after two cycles.						

HCM Signalized Intersection Capacity Analysis 8: River Street & Gerrard Street E 2032 Future Total PM Model (Sensitivity) 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4T		4T			4T					
Traffic Volume (vph)	220	855	70	85	390	105	110	345	160	165	450	210
Future Volume (vph)	220	855	70	85	390	105	110	345	160	165	450	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	3.0	9.5	0.0	9.8	0.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.99	0.99	1.00	0.98	0.98	1.00	0.98	0.98	1.00	1.00	0.96	0.96
Frbp. psd/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00
Frt	0.99	0.99	1.00	0.97	0.97	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Flt Protected	0.99	0.99	1.00	0.99	0.99	1.00	0.95	1.00	0.95	1.00	1.00	0.85
Satd. Flow (prot)	3384	3273	1624	1744	1624	1744	1643	1860	1643	1860	1424	1424
Flt Permitted	0.66	0.54	0.54	0.32	0.32	1.00	0.26	1.00	0.26	1.00	1.00	1.00
Satd. Flow (perm)	2268	1780	540	1744	540	1744	452	1860	452	1860	1424	1424
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	891	73	89	406	109	115	359	167	172	469	219
RTOR Reduction (vph)	0	4	0	0	14	0	0	14	0	0	0	125
Lane Group Flow (vph)	0	1189	0	0	590	0	115	512	0	172	469	94
Conf. Peds. (#/hr)	40	80	80	40	15	40	15	40	40	15	40	15
Conf. Bikes (#/hr)	35	35	35	15	15	15	15	15	15	15	15	15
Heavy Vehicles (%)	3%	2%	3%	0%	4%	0%	3%	0%	1%	1%	1%	2%
Turn Type	custom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protected Phases	5	5.2.9	6.10	6.10	8.12	8.12	8.12	8.12	4.11	4.11	4.11	4.11
Permitted Phases	2.9	6.10	6.10	45.2	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
Actuated Green, G (s)	57.3	48.5	46.2	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Effective Green, g (s)	48.5	46.2	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
Actuated g/C Ratio	0.46	0.44	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1141	780	745	745	745	745	193	794	608	794	608	608
v/s Ratio Prot	c0.09	0.29	0.29	0.29	0.29	0.29	0.25	0.25	0.25	0.25	0.25	0.25
v/s Ratio Perm	c0.39	0.33	0.33	0.33	0.33	0.33	0.38	0.38	0.38	0.38	0.38	0.38
v/c Ratio	1.04	0.76	0.76	0.76	0.76	0.76	0.89	0.89	0.89	0.89	0.89	0.89
Uniform Delay, d1	28.4	24.8	24.8	24.8	24.8	24.8	23.1	23.1	23.1	23.1	23.1	23.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.2	4.2	4.2	4.2	4.2	4.2	36.2	36.2	36.2	36.2	36.2	36.2
Delay (s)	66.6	29.0	29.0	29.0	29.0	29.0	64.1	64.1	64.1	64.1	64.1	64.1
Level of Service	E	C	C	C	C	C	E	E	E	E	E	E
Approach Delay (s)	66.6	29.0	29.0	29.0	29.0	29.0	30.8	30.8	30.8	30.8	30.8	30.8
Approach LOS	E	C	C	C	C	C	C	C	C	C	C	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	42.6 HCM 2000 Level of Service D											
HCM 2000 Volume to Capacity ratio	1.02											
Actuated Cycle Length (s)	105.3 Sum of lost time (s) 19.8											
Intersection Capacity Utilization	116.4% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

9. Sackville Street & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total PM Model (Sensitivity)  
 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	40	30	0	0	0	0	0	45	125	60
Future Volume (Veh/h)	0	0	40	30	0	0	0	0	0	45	125	60
Sign Control	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	47	35	0	0	0	0	0	53	147	71
Pedestrians	60	3.5	3.5	3.5	0.0	0.0	5	5	5	15	15	15
Lane Width (m)	3.5	3.5	3.5	3.5	1.1	1.1	1.1	1.1	1.1	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	5	5	3	3	0	0	0	0	0	1	1	1
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)												58
pX platoon unblocked												
VC, conflicting volume	364	384	248	376	419	50	278			35		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	364	384	248	376	419	50	278			35		
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
IF (s)	100	100	94	93	100	100	100			97		
p0 queue free %	508	490	754	486	468	979	1228			1540		
CM capacity (veh/h)												
Direction, Lane #	EB 1	WB 1	SB 1									
Volumes Total	47	35	271									
Volume Left	0	35	53									
Volume Right	47	0	71									
cSH	754	486	1540									
Volumes to Capacity	0.06	0.07	0.03									
Queue Length 95th (m)	1.5	1.8	0.8									
Control Delay (s)	10.1	13.0	1.7									
Lane LOS	B	B	A									
Approach Delay (s)	10.1	13.0	1.7									
Approach LOS	B	B	A									
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			37.5%									A
Analysis Period (min)			15									

10. Parliament Street & Oak Street  
 HCM Unsignalized Intersection Capacity Analysis  
 2032 Future Total PM Model (Sensitivity)  
 04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	55	65	535	25	15	375
Future Volume (Veh/h)	55	65	535	25	15	375
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	65	76	629	29	18	441
Pedestrians	220	5	5	5	55	55
Lane Width (m)	3.0	3.5	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	17	0	0	0	5	5
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)			151		143	
pX platoon unblocked						
VC, conflicting volume	1125	604			878	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	962	396			694	
IC, single (s)	6.8	6.9			4.3	
IC, 2 stage (s)						
p0 queue free %	3.5	3.3			2.3	
IF (s)	66	83			97	
p0 queue free %	191	444			639	
CM capacity (veh/h)						
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volumes Total	141	419	239	165	294	
Volume Left	65	0	0	18	0	
Volume Right	76	0	29	0	0	
cSH	275	1700	1700	639	1700	
Volumes to Capacity	0.51	0.25	0.14	0.03	0.17	
Queue Length 95th (m)	20.6	0.0	0.0	0.7	0.0	
Control Delay (s)	31.0	0.0	0.0	1.5	0.0	
Lane LOS	D	B	A	A	A	
Approach Delay (s)	31.0	0.0	0.0	0.5	0.0	
Approach LOS	D	D	A	A	A	
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			40.7%			
Analysis Period (min)			15			
ICU Level of Service						A

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 11: Oak Street & Dreamer's Way

04-04-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↑	↑
Traffic Volume (veh/h)	0	45	70	0	15	45
Future Volume (Veh/h)	0	45	70	0	15	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	48	75	0	16	48
Pedestrians		25	10		40	
Lane Width (m)		3.5	3.5		3.0	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		2	1		3	
Right turn flare (veh)						
Median type		None	None		None	
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume	115				173	140
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol	115				173	140
IC single (s)	4.1				6.4	6.2
IC 2 stage (s)	2.2				3.5	3.3
p0 queue free %	100				98	94
CM capacity (veh/h)	1441				790	866
Direction_Lane #	EB 1	WB 1	SB 1			
Volumes Total	48	75	64			
Volume Left	0	0	16			
Volume Right	0	0	48			
cSH	1700	1700	846			
Volumes to Capacity	0.03	0.04	0.08			
Queue Length 95th (m)	0.0	0.0	1.9			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			A
Intersection Capacity Utilization			27.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 12: Regent Street & Oak Street

04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	↑
Traffic Volume (veh/h)	60	0	0	55	15	50
Future Volume (Veh/h)	60	0	0	55	15	50
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	72	0	0	66	18	60
Pedestrians	15			15	40	
Lane Width (m)	3.5			3.5	3.0	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	3	
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC conflicting volume			112		193	127
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCu unblocked vol			112		193	127
IC single (s)			4.1		6.4	6.2
IC 2 stage (s)			2.2		3.5	3.3
p0 queue free %	100		100		98	93
CM capacity (veh/h)	1445		1445		766	889
Direction_Lane #	EB 1	WB 1	NB 1			
Volumes Total	72	66	78			
Volume Left	0	0	18			
Volume Right	0	0	60			
cSH	1700	1700	857			
Volumes to Capacity	0.04	0.04	0.09			
Queue Length 95th (m)	0.0	0.0	2.3			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.5			A
Intersection Capacity Utilization			27.3%		ICU Level of Service	A
Analysis Period (min)			15			



14: Sackville Street & Oak Street

15: Sumach Street & Oak Street

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop		Stop		Stop		Stop				
Traffic Volume (vph)	0	85	15	0	5	0	0	0	0	0	70	90
Future Volume (vph)	0	85	15	0	5	0	0	0	0	0	70	90
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	94	17	0	6	0	0	0	0	0	78	100
Direction, Lane #												
	EB 1	WB 1	SB 1									
Volume Total (vph)	111	6	217									
Volume Left (vph)	0	0	78									
Volume Right (vph)	17	0	39									
Had <sub>f</sub> (s)	-0.06	0.00	0.03									
Departure Headway (s)	4.3	4.5	4.2									
Degree Utilization, x	0.13	0.01	0.25									
Capacity (veh/h)	791	742	831									
Control Delay (s)	8.0	7.6	8.6									
Approach Delay (s)	8.0	7.6	8.6									
Approach LOS	A	A	A									
Intersection Summary												
Delay	8.4											
Level of Service	A											
Intersection Capacity Utilization	37.3%											
ICU Level of Service	A											
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop		Stop		Stop		Stop				
Traffic Volume (vph)	60	70	25	0	0	25	5	140	75	0	0	0
Future Volume (vph)	60	70	25	0	0	25	5	140	75	0	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	66	77	27	0	0	27	5	154	82	0	0	0
Direction, Lane #												
	EB 1	WB 1	NB 1									
Volume Total (vph)	170	27	241									
Volume Left (vph)	66	0	5									
Volume Right (vph)	27	27	82									
Had <sub>f</sub> (s)	0.05	-0.60	-0.13									
Departure Headway (s)	4.5	4.1	4.2									
Degree Utilization, x	0.21	0.03	0.28									
Capacity (veh/h)	749	817	816									
Control Delay (s)	8.8	7.2	8.9									
Approach Delay (s)	8.8	7.2	8.9									
Approach LOS	A	A	A									
Intersection Summary												
Delay	8.7											
Level of Service	A											
Intersection Capacity Utilization	39.4%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 16: Tubman Avenue/Street 'J' & Oak Street

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	135	10	0	0	0	0	0	0	20	30	25
Future Volume (Veh/h)	0	135	10	0	0	0	0	0	0	20	30	25
Sign Control		Free	Free		Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade		0%	0%		0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.83	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	145	11	0	0	0	0	0	0	22	32	27
Pedestrians		20			5		30					
Lane Width (m)		3.5			0.0		0.0					
Walking Speed (m/s)		1.1			1.1		1.1					
Percent Blockage		2			0		0					
Right turn flare (veh)												
Median type		None			None		None					
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked												
VC, conflicting volume	0	186		186		244	180	186	156	186	20	20
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	0	186		186		244	180	186	156	186	20	20
IC, single (s)	4.1	4.1		4.1		7.1	6.5	6.2	7.1	6.5	6.2	6.2
IC, 2 stage (s)												
IF (s)	2.2	2.2		2.2		3.5	4.0	3.3	3.5	4.0	3.3	3.3
p0 queue free %	100	100		100		100	100	100	97	96	97	97
CM capacity (veh/h)	1636	1401		1401		660	717	862	816	712	1045	1045
Direction, Lane #	EB 1	SB 1										
Volumes Total	156	81										
Volume Left	0	22										
Volume Right	11	27										
cSH	1700	829										
Volumes to Capacity	0.09	0.10										
Queue Length 95th (m)	0.0	2.5										
Control Delay (s)	0.0	9.8										
Lane LOS	A	A										
Approach Delay (s)	0.0	9.8										
Approach LOS	A	A										
Intersection Summary												
Average Delay		3.4										
Intersection Capacity Utilization		30.4%										A
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 18: River Street & Oak Street

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	5	60	20	0	50	0	475	40	50	555	0
Future Volume (Veh/h)	90	5	60	20	0	50	0	475	40	50	555	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade		0%	0%		0%		0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	5	65	22	0	54	0	516	43	54	603	0
Pedestrians		75		45			50				5	
Lane Width (m)		3.5		3.5			3.5				3.5	
Walking Speed (m/s)		1.1		1.1			1.1				1.1	
Percent Blockage		7		4			4				0	
Right turn flare (veh)												
Median type		None					None				None	
Median storage (veh)												
Upstream signal (m)									143			151
pX platoon unblocked	0.88	0.88	0.80	0.88	0.88	0.84	0.80	0.84	0.84	0.84	0.84	0.84
VC, conflicting volume	1382	1390	728	1411	1368	588	678				604	
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	950	959	534	982	934	410	472				429	
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	37	97	83	84	100	90	100				94	
CM capacity (veh/h)	156	193	385	133	199	517	822				917	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volumes Total	168	76	559	657								
Volume Left	98	22	0	54								
Volume Right	65	54	43	0								
cSH	204	282	1700	917								
Volumes to Capacity	0.82	0.27	0.33	0.06								
Queue Length 95th (m)	45.5	8.1	0.0	1.4								
Control Delay (s)	72.7	22.4	0.0	1.5								
Lane LOS	F	C	A	A								
Approach Delay (s)	72.7	22.4	0.0	1.5								
Approach LOS	F	C	A	A								
Intersection Summary												
Average Delay			10.2									
Intersection Capacity Utilization			86.8%									E
Analysis Period (min)			15									

19: Parliament Street & Cole Street

2032 Future Total PM Model (Sensitivity)

04-04-2023

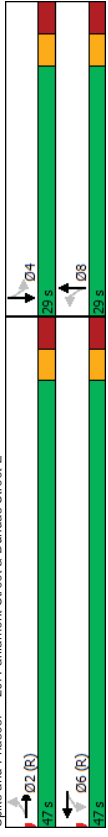
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			←	←	←	←
Traffic Volume (veh/h)	0	0	560	20	25	405
Future Volume (Veh/h)	0	0	560	20	25	405
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	667	24	30	482
Pedestrians	255	0	0	0	0	15
Lane Width (m)	0.0	0.0	3.5	3.5	3.5	3.5
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	0	0	2	2	2	1
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)			80	80	80	214
pX platoon unblocked	0.88	0.88	0.88	0.88	0.88	0.88
VC, conflicting volume	1260	616				946
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1032	303				677
IC, single (s)	6.8	6.9				4.1
IC, 2 stage (s)						
p0 queue free %	3.5	3.3				2.2
IF (s)	100	100				96
CM capacity (veh/h)	193	610				817
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	445	246	191	321		
Volume Left	0	0	30	0		
Volume Right	0	24	0	0		
cSH	1700	1700	817	1700		
Volumes to Capacity	0.26	0.14	0.04	0.19		
Queue Length 95th (m)	0.0	0.0	0.9	0.0		
Control Delay (s)	0.0	0.0	1.8	0.0		
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.7			
Approach LOS						
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			43.9%			A
Analysis Period (min)			15			

20: Parliament Street & Dundas Street E

2032 Future Total PM Model (Sensitivity)

04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations			←	←	←	←	←	←
Traffic Volume (vph)	80	495	55	195	45	430	45	335
Future Volume (vph)	80	495	55	195	45	430	45	335
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4	
Permitted Phases	2	2	6	6	8	8	4	4
Detector Phase								
Switch Phase								
Minimum Initial (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
47.0 Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	61.8%	61.8%	61.8%	61.8%	38.2%	38.2%	38.2%	38.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode								
Act Effct Green (s)	41.0	41.0	C-Min	C-Min	Min	Min	Min	Min
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.33	0.33	0.33	0.33
v/c Ratio	0.48	0.48	0.28	0.28	0.62	0.62	0.52	0.52
Control Delay	12.2	13.7	13.7	24.0	22.6	22.6	22.6	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	13.7	13.7	24.0	22.6	22.6	22.6	22.6
LOS	B	B	B	C	C	C	C	C
Approach Delay	12.2	13.7	13.7	24.0	22.6	22.6	22.6	22.6
Approach LOS	B	B	B	C	C	C	C	C
Intersection Summary								
Cycle Length: 76								
Actuated Cycle Length: 76								
Offset: 9 (12%) Referenced to phase 2:EBTL and 6:WBTL Start of 1st Green								
Natural Cycle: 60								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.62								
Intersection Signal Delay: 17.9								
Intersection Capacity Utilization 93.3%								
Analysis Period (min) 15								



20: Parliament Street & Dundas Street E

	EBT	WBT	NBT	SBT
Lane Group	713	360	585	455
Lane Group Flow (vph)	0.48	0.28	0.62	0.52
v/c Ratio	12.2	13.7	24.0	22.6
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	12.2	13.7	24.0	22.6
Total Delay	28.9	10.7	36.6	27.5
Queue Length 50th (m)	46.8	29.9	47.5	37.2
Queue Length 95th (m)	85.0	103.5	45.0	56.1
Internal Link Dist (m)				
Turn Bay Length (m)	1512	1299	948	867
Base Capacity (vph)	0	0	0	0
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.28	0.62	0.52
Intersection Summary				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4TB			4TB			4TB			4TB		
Traffic Volume (vph)	80	495	60	55	195	70	45	430	45	45	335	25	
Future Volume (vph)	80	495	60	55	195	70	45	430	45	45	335	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. 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	
Frbp. ped/bikes	0.98	0.98	0.98	0.94	0.94	0.98	0.98	0.98	0.98	0.98	0.99	0.99	
Frbp. psd/bikes	0.98	0.98	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Frt	0.99	0.99	0.99	0.97	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Flt Protected													
Satld. Flow (prot)	3197	3016	3269	3269	3016	3197	3016	3269	3269	3016	3197	3016	
Flt Permitted	0.85	0.77	0.87	0.87	0.77	0.85	0.85	0.77	0.87	0.87	0.85	0.77	
Satld. Flow (perm)	2720	2336	2855	2855	2336	2720	2720	2336	2855	2855	2720	2336	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
Adj. Flow (vph)	90	556	67	62	219	79	51	483	51	51	376	28	
RTOR Reduction (vph)	0	11	0	0	8	0	0	9	0	0	6	0	
Lane Group Flow (vph)	0	702	0	0	352	0	0	576	0	0	449	0	
Confl. Peds. (#/hr)	260	155	155	260	165	225	225	165	225	225	165	165	
Confl. Bikes (#/hr)	25	25	25	20	20	20	20	20	20	20	20	20	
Heavy Vehicles (%)	3%	6%	5%	5%	6%	6%	3%	5%	0%	3%	8%	10%	
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	
Protected Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Permitted Phases	2	2	2	6	6	6	8	8	8	8	4	4	
Actuated Green, G (s)	40.0	40.0	40.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
Effective Green, g (s)	41.0	41.0	41.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1467	1260	939	939	1260	1467	939	939	1260	1467	939	861	
v/s Ratio Prot													
v/s Ratio Perm	0.26	0.15	0.15	0.20	0.20	0.20	0.17	0.17	0.17	0.17	0.17	0.17	
v/c Ratio	0.48	0.28	0.28	0.61	0.61	0.61	0.52	0.52	0.52	0.52	0.52	0.52	
Uniform Delay, d1	10.9	9.5	9.5	21.4	21.4	21.4	20.7	20.7	20.7	20.7	20.7	20.7	
Progression Factor	1.00	1.39	1.39	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.5	0.5	1.2	1.2	1.2	0.6	0.6	0.6	0.6	0.6	0.6	
Delay (s)	12.0	13.7	13.7	22.6	22.6	22.6	21.2	21.2	21.2	21.2	21.2	21.2	
Level of Service	B	B	B	C	C	C	C	C	C	C	C	C	
Approach Delay (s)	12.0	13.7	13.7	22.6	22.6	22.6	21.2	21.2	21.2	21.2	21.2	21.2	
Approach LOS	B	B	B	C	C	C	C	C	C	C	C	C	
Intersection Summary													
HCM 2000 Control Delay	17.2											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53												
Actuated Cycle Length (s)	76.0											Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.3%											ICU Level of Service	F
Analysis Period (min)	15												
c Critical Lane Group													

21: Regent Street & Dundas Street E

04-04-2023

2032 Future Total PM Model (Sensitivity)

04-04-2023

2032 Future Total PM Model (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	45	510	15	5	310	25	5	10	5	5	5
Traffic Volume (veh/h)	45	510	15	5	310	25	5	10	5	5	5
Future Volume (Veh/h)	45	510	15	5	310	25	5	10	5	5	5
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	48	548	16	5	333	27	5	11	5	5	5
Pedestrians	30			10			125				135
Lane Width (m)	3.5			3.5			3.5				3.5
Walking Speed (m/s)	1.1			1.1			1.1				1.1
Percent Blockage	3			1			11				12
Right turn flare (veh)											
Median type	None			None							
Median storage (veh)											
Upstream signal (m)	127			124							
pX platoon unblocked											
VC, conflicting volume	495			689			1013	1282	417	882	1276
VC1, stage 1 conf vol											
VC2, stage 2 conf vol											
VCU, unblocked vol	495			566			908	1191	280	770	1185
IC, single (s)	4.1			4.4			7.5	6.5	7.9	7.5	6.5
IC, 2 stage (s)	2.2			2.4			3.5	4.0	3.8	3.5	4.0
p0 queue free %	95			99			96	92	99	97	96
CM capacity (veh/h)	950			770			142	133	496	181	134
Direction, Lane #	EB1	EB2	WB1	WB2	NB1	NB1	SB1				
Volume Total	322	290	172	194	21	37					
Volume Left	48	0	5	0	5	5					
Volume Right	0	16	0	27	5	27					
cSH	950	1700	770	1700	164	328					
Volumes to Capacity	0.05	0.17	0.01	0.11	0.13	0.11					
Queue Length 95th (m)	1.2	0.0	0.1	0.0	3.3	2.9					
Control Delay (s)	1.8	0.0	0.4	0.0	30.2	17.4					
Lane LOS	A	A	A	D	C	C					
Approach Delay (s)	0.9	0.2	0.2	30.2	17.4						
Approach LOS	D	D	C								
Intersection Summary											
Average Delay	1.9										
Intersection Capacity Utilization	49.4%										
ICU Level of Service	A										
Analysis Period (min)	15										



Spills and Phases: 22: Sackville Street & Dundas Street E

Regent Park Phases 4 & 5

BA Group - NHY

Synchro 11 Report

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22: Sackville Street & Dundas Street E

04-04-2023

2032 Future Total PM Model (Sensitivity)

04-04-2023

2032 Future Total PM Model (Sensitivity)

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4
Traffic Volume (vph)	500	15	250	40	0	25	35
Future Volume (vph)	500	15	250	40	0	25	35
Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		4
Permitted Phases	2	6	6	8	8	4	4
Detector Phase							
Switch Phase							
Minimum Initial (s)	17.0	17.0	17.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	26.0	26.0	26.0	26.0
Total Split (s)	50.0	50.0	50.0	26.0	26.0	26.0	26.0
Total Split (%)	65.8%	65.8%	65.8%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	None	None	None	None
Ad Effct Green (s)	47.6	47.6	47.6	18.4	18.4	18.4	18.4
Actuated g/C Ratio	0.63	0.63	0.63	0.24	0.24	0.24	0.24
v/C Ratio	0.28	0.27	0.27	0.23	0.23	0.23	0.23
Control Delay	5.8	5.8	5.8	13.2	13.2	13.2	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	5.8	5.8	13.2	13.2	13.2	14.9
LOS	A	A	A	B	B	B	B
Approach Delay	5.8	5.8	5.8	13.2	13.2	13.2	14.9
Approach LOS	A	A	A	B	B	B	B
Intersection Summary							
Cycle Length: 76							
Actuated Cycle Length: 76							
Offset: 25 (33%), Referenced to phase 2EBT and 6WBTL Start of 1st Green							
Natural Cycle: 50							
Control Type: Actuated-Coordinated							
Maximum v/C Ratio: 0.30							
Intersection Signal Delay: 7.7							
Intersection Capacity Utilization 49.7%							
ICU Level of Service A							
Analysis Period (min) 15							



Spills and Phases: 22: Sackville Street & Dundas Street E

Regent Park Phases 4 & 5

BA Group - NHY

Synchro 11 Report

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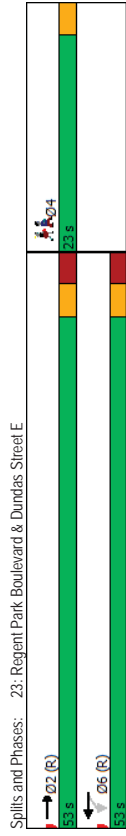
Queues 2032 Future Total PM Model (Sensitivity) 04-04-2023

HCM Signalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity) 04-04-2023

	EBT	WBT	NBT	SBT
Lane Group	570	285	75	119
Lane Group Flow (vph)	0.28	0.27	0.23	0.30
v/c Ratio	5.8	7.0	13.2	14.9
Control Delay	0.0	0.3	0.0	0.0
Queue Delay	5.8	7.2	13.2	14.9
Total Delay	12.9	18.1	3.4	7.0
Queue Length 50th (m)	21.4	21.6	12.9	19.2
Queue Length 95th (m)	99.8	79.6	36.2	126.8
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	2062	1062	367	449
Station Cap Reductn	0	317	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.38	0.20	0.27
<b>Intersection Summary</b>				

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4				4	4				
Traffic Volume (vph)	0	500	30	15	250	0	40	0	30	25	35	50
Future Volume (vph)	0	500	30	15	250	0	40	0	30	25	35	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.5
Total Lost time (s)	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.98	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.96	0.96	0.96
Frbp. ped/bikes	1.00	0.99	0.99	1.00	0.99	0.96	0.96	0.96	0.96	0.98	0.98	0.98
Frt	1.00	0.99	0.99	1.00	0.94	0.94	0.94	0.94	0.94	0.99	0.99	0.99
Flt Protected	3291	1756	1756	1495	1495	1495	1495	1495	1495	1588	1588	1588
Satd. Flow (prot)	1.00	0.96	0.96	0.79	0.79	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Flt Permitted	3291	1695	1695	1220	1220	1485	1485	1485	1485	1485	1485	1485
Satd. Flow (perm)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Peak-hour factor, PHF	0	538	32	16	269	0	43	0	32	27	38	54
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	570	0	0	285	0	42	0	42	0	0	78
Lane Group Flow (vph)	105	175	175	105	70	55	55	70	55	55	70	5
Confl. Bikes (#/hr)	0%	5%	6%	0%	6%	0%	0%	0%	12%	0%	2%	5%
Heavy Vehicles (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turn Type	2	6	6	6	6	8	8	8	8	4	4	4
Protected Phases	46.6	47.6	47.6	18.4	18.4	17.4	17.4	17.4	17.4	18.4	18.4	17.4
Permitted Phases	0.63	0.63	0.63	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Actuated Green, G (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Effective Green, g (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Actuated q/C Ratio	2061	1061	1061	295	295	359	359	359	359	359	359	359
Clearance Time (s)	0.17	0.17	0.17	0.03	0.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Vehicle Extension (s)	0.28	0.27	0.27	0.14	0.14	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Lane Grp Cap (vph)	6.4	6.4	6.4	22.6	22.6	23.0	23.0	23.0	23.0	23.0	23.0	23.0
v/s Ratio Perm	0.76	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/c Ratio	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Uniform Delay, d1	5.2	6.1	6.1	22.8	22.8	23.3	23.3	23.3	23.3	23.3	23.3	23.3
Progression Factor	A	A	A	C	C	C	C	C	C	C	C	C
Incremental Delay, d2	5.2	6.1	6.1	22.8	22.8	23.3	23.3	23.3	23.3	23.3	23.3	23.3
Delay (s)	5.2	6.1	6.1	22.8	22.8	23.3	23.3	23.3	23.3	23.3	23.3	23.3
Level of Service	A	A	A	C	C	C	C	C	C	C	C	C
Approach Delay (s)	5.2	6.1	6.1	22.8	22.8	23.3	23.3	23.3	23.3	23.3	23.3	23.3
Approach LOS	A	A	A	C	C	C	C	C	C	C	C	C
<b>Intersection Summary</b>												
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.26	A										
Actuated Cycle Length (s)	76.0	Sum of lost time (s)										
Intersection Capacity Utilization	49.7%	ICU Level of Service										
Analysis Period (min)	15	A										
c Critical Lane Group												

Lane Group	EBT	WBL	WBT	Ø4
Lane Configurations	1	1	1	4
Traffic Volume (vph)	525	15	265	4
Future Volume (vph)	525	15	265	4
Turn Type	NA	Perm	NA	4
Protected Phases	2	6	6	4
Permitted Phases	2	6	6	4
Detector Phase				
Switch Phase				
Minimum Initial (s)	18.0	18.0	18.0	20.0
Minimum Split (s)	23.9	23.9	23.9	23.0
Total Split (s)	53.0	53.0	53.0	23.0
Total Split (%)	69.7%	69.7%	69.7%	30%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	2.9	2.9	2.9	0.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.9	4.9	4.9	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	C-Min	C-Min	C-Min	None
Act Effct Green (s)	64.8	64.8	64.8	
Actuated g/C Ratio	0.85	0.85	0.85	
v/c Ratio	0.43	0.22	0.22	
Control Delay	3.1	4.1	4.1	
Queue Delay	0.0	0.0	0.0	
Total Delay	3.1	4.1	4.1	
LOS	A	A	A	
Approach Delay	3.1	4.1	4.1	
Approach LOS	A	A	A	
<b>Intersection Summary</b>				
Cycle Length: 76				
Actuated Cycle Length: 76				
Offset: 22 (29%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green				
Natural Cycle: 60				
Control Type: Actuated-Coordinated				
Maximum v/c Ratio: 0.43				
Intersection Signal Delay: 3.4				
Intersection Capacity Utilization 49.5%				
ICU Level of Service A				
Analysis Period (min) 15				



Lane Group	EBT	WBT
Lane Group Flow (vph)	624	315
v/c Ratio	0.43	0.22
Control Delay	3.1	4.1
Queue Delay	0.0	0.0
Total Delay	3.1	4.1
Queue Length 50th (m)	0.6	0.0
Queue Length 95th (m)	61.4	29.1
Internal Link Dist (m)	79.6	86.0
Turn Bay Length (m)		
Base Capacity (vph)	1462	1450
Starvation Cap Reductn	38	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.44	0.22
<b>Intersection Summary</b>		



23: Regent Park Boulevard & Dundas Street E

2032 Future Total PM Model (Sensitivity)

04-04-2023

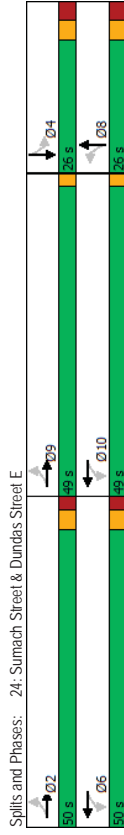
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EB	EB	WB	WB	NB	NB
Traffic Volume (vph)	525	30	15	265	0	0
Future Volume (vph)	525	30	15	265	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.0	3.0	3.5	3.0	3.0
Total Lost time (s)	4.9		4.9			
Lane Util. Factor	1.00		1.00			
Frbp. ped/bikes	0.97		1.00			
Frbp. ped/bikes	1.00		0.99			
Frt	0.99		1.00			
Flt Protected	1.00		1.00			
Sat'd Flow (prot)	1711		1755			
Flt Permitted	1.00		0.96			
Sat'd Flow (perm)	1711		1696			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	590	34	17	298	0	0
RTOR Reduction (vph)	1	0	0	0	0	0
Lane Group Flow (vph)	623	0	0	315	0	0
Conf. Peds. (#/hr)	235	235	60	65		
Heavy Vehicles (%)	6%	6%	0%	6%	0%	0%
Turn Types	NA	Perm	NA			
Protected Phases	2		6			
Permitted Phases	6		6			
Actuated Green, G (s)	59.1		59.1			
Effective Green, g (s)	60.1		60.1			
Actuated g/C Ratio	0.79		0.79			
Clearance Time (s)	5.9		5.9			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap. (vph)	1353		1341			
v/s Ratio Prot	0.36		0.19			
v/s Ratio Perm	0.46		0.23			
Uniform Delay, d1	2.6		2.0			
Progression Factor	0.48		1.00			
Incremental Delay, d2	1.1		0.4			
Delay (s)	2.3		2.5			
Level of Service	A		A			
Approach Delay (s)	2.3		2.5	0.0		
Approach LOS	A		A	A		
Intersection Summary						
HCM 2000 Control Delay	2.4 HCM 2000 Level of Service A					
HCM 2000 Volume to Capacity ratio	0.41					
Actuated Cycle Length (s)	76.0 Sum of lost time (s) 7.9					
Intersection Capacity Utilization	49.5% ICU Level of Service A					
Analysis Period (min)	15					
c. Critical Lane Group						

24: Sumach Street & Dundas Street E

2032 Future Total PM Model (Sensitivity)

04-04-2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø2	Ø6	Ø9	Ø10
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB				
Traffic Volume (vph)	50	455	30	250	25	90	25	10				
Future Volume (vph)	50	455	30	250	25	90	25	10				
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA				
Permitted Phases	2 9		6 10		8		4					
Detector Phase	2		6		8		4					
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.0	16.0	5.0	5.0
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	21.0	21.0	49.0	49.0
Total Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	50.0	50.0	49.0	49.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	20.8%	40%	40%	39%	39%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)					-1.0		-1.0					
Total Lost Time (s)					5.0		5.0					
Lead-Lag												
Lead-Lag Optimize?					None		None		Min	Min	None	None
Recall Mode												
Act Effct Green (s)	63.1		7.3		63.1		22.8					
Actuated g/C Ratio	0.66		0.66		0.66		0.24					
v/C Ratio	0.55		0.45		0.47		0.13					
Control Delay	9.4		7.3		41.0		34.8					
Queue Delay	2.2		0.0		0.0		0.0					
Total Delay	11.6		7.3		41.0		34.8					
LOS	B		A		D		C					
Approach Delay	11.6		7.3		41.0		34.8					
Approach LOS	B		A		D		C					
Intersection Summary												
Cycle Length	125											
Actuated Cycle Length	95.7											
Natural Cycle	100											
Control Type	Actuated-Uncoordinated											
Maximum v/C Ratio	0.55											
Intersection Signal Delay	15.2											
Intersection Capacity Utilization	63.2%											
Analysis Period (min)	15											



Queues 2032 Future Total PM Model (Sensitivity) 04-04-2023

24: Sumach Street & Dundas Street E

	→	←	↑	↓
	EBT	WBT	NBT	SBT
Lane Group	565	419	172	43
Lane Group Flow (vph)	0.55	0.45	0.47	0.13
v/c Ratio	9.4	7.3	41.0	34.8
Control Delay	2.2	0.0	0.0	0.0
Queue Delay	11.6	7.3	41.0	34.8
Total Delay	44.4	26.3	28.8	6.3
Queue Length 50th (m)	64.8	41.0	56.3	17.5
Queue Length 95th (m)	86.0	75.5	76.2	121.5
Internal Link Dist (m)				
Turn Bay Length (m)	1174	1047	363	322
Base Capacity (vph)	453	0	0	0
Station Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.40	0.47	0.13
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity) 04-04-2023

24: Sumach Street & Dundas Street E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		+			+			+			+		
Traffic Volume (vph)	50	455	20	30	250	110	25	90	45	25	10	5	
Future Volume (vph)	50	455	20	30	250	110	25	90	45	25	10	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	0.98	0.98	0.91	0.91	0.91	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Flpb, ped/bikes	0.99	0.99	0.99	0.99	0.99	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Flt	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.97	0.97	
Flt Protected	1.685	1.685	1.507	1.507	1.507	1.581	1.581	1.581	1.581	1.581	1.616	1.616	
Satd. Flow (prot)	0.93	0.93	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.82	0.82	
Flt Permitted	1574	1574	1422	1422	1422	1517	1517	1517	1517	1517	1360	1360	
Satd. Flow (perm)	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Peak-hour factor, PHF	54	489	22	32	269	118	27	97	48	27	11	5	
Adj. Flow (vph)	0	2	0	0	14	0	0	10	0	0	4	0	
RTOR Reduction (vph)	0	563	0	0	405	0	0	162	0	0	39	0	
Lane Group Flow (vph)	100	185	185	100	105	100	105	50	50	50	105	105	
Confl. Bikes (#/hr)	25			20									
Heavy Vehicles (%)	12%	6%	8%	0%	9%	5%	4%	5%	6%	0%	9%	0%	
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA	
Protected Phases	2.9			6.10			8				4		
Permitted Phases	2.9			6.10			8				4		
Actuated Green, G (s)	65.6			65.6			21.7				21.7		
Effective Green, g (s)	66.6			66.6			22.7				22.7		
Actuated g/C Ratio	0.70			0.70			0.24				0.24		
Clearance Time (s)							6.0				6.0		
Vehicle Extension (s)							3.0				3.0		
Lane Grp Cap (vph)	1099			993			361				323		
v/s Ratio Prot													
v/s Ratio Perm	60.36			0.28			60.11				0.03		
v/c Ratio	0.51			0.41			0.45				0.12		
Uniform Delay, d1	6.7			6.0			31.0				28.5		
Progression Factor	1.00			1.00			1.00				1.00		
Incremental Delay, d2	0.4			0.3			0.9				0.2		
Delay (s)	7.1			6.3			31.9				28.6		
Level of Service	A			A			C				C		
Approach Delay (s)	7.1			6.3			31.9				28.6		
Approach LOS	A			A			C				C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	11.2											HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51												
Actuated Cycle Length (s)	95.3											Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.2%											ICU Level of Service	B
Analysis Period (min)	15												
c Critical Lane Group													

25: Tubman Avenue & Dundas Street E

04-04-2023

2032 Future Total PM Model (Sensitivity)

04-04-2023

2032 Future Total PM Model (Sensitivity)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	515	10	10	380	0	0	0	0	0	30	0
Future Volume (Veh/h)	0	515	10	10	380	0	0	0	0	0	30	0
Sign Control	Free	Free	Free	Free	Free	Free	Slop	Slop	Slop	Slop	Slop	Slop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	0	542	11	11	400	0	0	0	0	32	0	11
Pedestrians	10			10			130			50		
Lane Width (m)	3.5			3.5			0.0			3.5		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	1			1			0			4		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	99			98								
pX platoon unblocked												
VC, conflicting volume	450			683			1120	1150	688	1030	1155	460
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	450			560			1063	1097	565	959	1103	460
IC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	83	100	98
CM capacity (veh/h)	1072			888			164	176	455	188	175	574
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	553	411	43									
Volume Left	0	11	32									
Volume Right	11	0	11									
cSH	1072	888	227									
Volume to Capacity	0.00	0.01	0.19									
Queue Length 95th (m)	0.0	0.3	5.2									
Control Delay (s)	0.0	0.4	24.5									
Lane LOS	A	A	C									
Approach Delay (s)	0.0	0.4	24.5									
Approach LOS	C	C	C									
Intersection Summary												
Average Delay				1.2								
Intersection Capacity Utilization				45.1%								A
Analysis Period (min)				15								



Spills and Phases: 26: River Street & Dundas Street E

Regent Park Phases 4 & 5

BA Group - NHY

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26: River Street & Dundas Street E

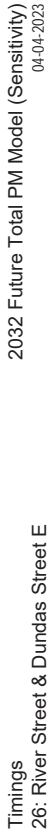
04-04-2023

2032 Future Total PM Model (Sensitivity)

04-04-2023

2032 Future Total PM Model (Sensitivity)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø1	Ø2	Ø6	Ø9	Ø10
Lane Configurations													
Traffic Volume (vph)	25	455	95	240	60	380	110	440					
Future Volume (vph)	25	455	95	240	60	380	110	440					
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA					
Protected Phases	2, 9		6, 10		8		4						
Permitted Phases	2		6		8		4						
Detector Phase													
Switch Phase													
Minimum Initial (s)					21.0		21.0		21.0		21.0		5.0
Minimum Split (s)					27.0		27.0		27.0		27.0		27.0
Total Split (s)					42.0		42.0		42.0		42.0		27.0
Total Split (%)					40.8%		40.8%		40.8%		40.8%		26%
Yellow Time (s)					3.0		3.0		3.0		3.0		2.0
All-Red Time (s)					3.0		3.0		3.0		3.0		0.0
Lost Time Adjust (s)					-1.0		-1.0		-1.0		-1.0		0.0
Total Lost Time (s)					5.0		5.0		5.0		5.0		0.0
Lead-Lag													
Lead-Lag Optimize?													
Recall Mode													
Act Effct Green (s)					32.0		37.7		37.7		37.7		None
Actuated g/C Ratio					0.40		0.47		0.47		0.47		0.47
v/C Ratio					0.85		0.95		0.81		0.65		0.73
Control Delay					34.1		51.9		21.6		29.5		40.7
Queue Delay					0.8		0.0		0.0		0.0		0.0
Total Delay					34.8		51.9		21.6		29.5		40.7
LOS					C		D		C		D		C
Approach Delay					34.8		51.9		28.8		29.0		29.0
Approach LOS					C		D		C		C		C
Intersection Summary													
Cycle Length					103								
Actuated Cycle Length					79.9								
Natural Cycle					95								
Control Type					Actuated-Uncoordinated								
Maximum v/C Ratio					0.95								
Intersection Signal Delay					34.9								
Intersection Capacity Utilization					125.3%								
Analysis Period (min)					15								



Spills and Phases: 26: River Street & Dundas Street E

Regent Park Phases 4 & 5

BA Group - NHY

Synchro 11 Report

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Queues 26: River Street & Dundas Street E 2032 Future Total PM Model (Sensitivity) 04-04-2023

	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group	573	479	63	626	116	558
Lane Group Flow (vph)	0.85	0.95	0.29	0.81	0.65	0.73
v/c Ratio	34.1	51.9	21.6	29.5	40.7	26.6
Control Delay	0.8	0.0	0.0	0.0	0.0	0.0
Queue Delay	34.8	51.9	21.6	29.5	40.7	26.6
Total Delay	74.2	63.9	5.1	67.3	11.6	58.3
Queue Length 50th (m)	109.6	105.1	21.8	#198.9	#54.5	#173.9
Queue Length 95th (m)	73.4	80.5		131.0		118.9
Internal Link Dist (m)			20.0		25.0	
Turn Bay Length (m)						
Base Capacity (vph)	707	529	221	777	179	763
Station Cap Reductn	24	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.91	0.29	0.81	0.65	0.73

**Intersection Summary**  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 26: River Street & Dundas Street E 2032 Future Total PM Model (Sensitivity) 04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+	+									
Traffic Volume (vph)	25	455	65	95	240	120	60	380	215	110	440	90
Future Volume (vph)	25	455	65	95	240	120	60	380	215	110	440	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	5.0						5.0			5.0		5.0
Lane Util. Factor	1.00						1.00			1.00		1.00
Frbp. ped/bikes	0.98			0.96			1.00	0.94		1.00	0.97	1.00
Frbp. psd/bikes	1.00			0.99			0.96	1.00	0.95	1.00	0.97	1.00
Frt	1.00			0.99			1.00	0.95		1.00	0.95	1.00
Frt Protected	1.00			0.99			1.00	0.95		1.00	0.95	1.00
Satd. Flow (prot)	1723			1631			1534	1637		1595	1618	
Flt Permitted	0.97			0.75			0.28	1.00		0.22	1.00	
Satd. Flow (perm)	1670			1230			450	1637		369	1618	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	479	68	100	253	126	63	400	226	116	463	95
RTOR Reduction (vph)	0	5	0	0	14	0	0	17	0	0	6	0
Lane Group Flow (vph)	0	568	0	0	465	0	63	609	0	116	552	0
Confl. Peds. (#/hr)	55	75	75	75	75	55	75	75	75	75	75	5
Confl. Bikes (#/hr)			25			20			10			
Heavy Vehicles (%)	9%	5%	0%	1%	9%	0%	5%	3%	0%	2%	12%	0%
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	NA
Protected Phases	2.9			6.10			8				4	
Permitted Phases	2.9			6.10			8				4	
Actuated Green, G (s)	36.7			36.7			36.7			36.7	36.7	
Effective Green, g (s)	37.7			37.7			37.7			37.7	37.7	
Actuated g/C Ratio	0.46			0.46			0.46			0.46	0.46	
Clearance Time (s)							6.0			6.0	6.0	
Vehicle Extension (s)							3.0			3.0	3.0	
Lane Grp Cap (vph)	773			569			208	758		170	749	
v/s Ratio Prot							0.37				0.34	
v/s Ratio Perm	0.34			0.38			0.14			0.31		
v/c Ratio	0.73			0.82			0.30	0.80		0.68	0.74	
Uniform Delay, d1	17.8			18.9			13.6	18.7		17.2	17.8	
Progression Factor	1.00			1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6			8.8			0.8	6.2		10.7	3.8	
Delay (s)	21.4			27.7			14.5	24.9		27.9	21.6	
Level of Service	C			C			B	C		C	C	
Approach Delay (s)	21.4			27.7			23.9			22.7		
Approach LOS	C			C			C			C	C	
Intersection Summary												
HCM 2000 Control Delay	23.7 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	81.4 Sum of lost time (s) 11.0											
Intersection Capacity Utilization	125.3% ICU Level of Service H											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 27: Dreamer's Way & Gerrard Street E

04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (veh/h)	915	70	15	440	0	0
Future Volume (Veh/h)	915	70	15	440	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	963	74	16	463	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		
Median type						
Median storage (veh)	90			162		
Upstream signal (m)		0.86		0.86	0.86	0.86
pX platoon unblocked	1037			1264		518
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	715			979		111
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)						
IF (s)	2.2			3.5		3.3
p0 queue free %	98			100		100
CM capacity (veh/h)	769			211		796
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volumes Total	642	395	170	309		
Volume Left	0	0	16	0		
Volume Right	0	74	0	0		
cSH	1700	1700	769	1700		
Volumes to Capacity	0.38	0.23	0.02	0.18		
Queue Length 95th (m)	0.0	0.0	0.5	0.0		
Control Delay (s)	0.0	0.0	1.1	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	0.0		0.4			
Approach LOS			A			
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	30.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 28: Dreamer's Way & Site Driveway

04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑					↑
Traffic Volume (veh/h)	10	0	0	0	20	65
Future Volume (Veh/h)	10	0	0	0	20	65
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	0	0	21	68
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None			None		None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	110				0	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	110				0	
IC, single (s)	6.4				4.1	
IC, 2 stage (s)						
IF (s)	3.5				2.2	
p0 queue free %	99				100	
CM capacity (veh/h)	880				1636	
Direction, Lane #	WB 1				SB 1	
Volumes Total	11				89	
Volume Left	11				21	
Volume Right	0				0	
cSH	880				1636	
Volumes to Capacity	0.01				0.01	
Queue Length 95th (m)	0.3				0.3	
Control Delay (s)	9.1				1.8	
Lane LOS	A				A	
Approach Delay (s)	9.1				1.8	
Approach LOS	A				A	
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	14.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 29: Sumach Street & Site Driveway

04-04-2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	0	0	0	35	20	145	60	0	0	0
Future Volume (Veh/h)	10	0	0	0	0	35	20	145	60	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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
Hourly flow rate (vph)	11	0	0	0	0	37	21	153	63	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (m)												55
pX platoon unblocked												
VC, conflicting volume	264	258	0	226	226	184	0	216				
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCu, unblocked vol	264	258	0	226	226	184	0	216				
IC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
IF (s)	98	100	100	100	100	96	99	100				
p0 capacity (veh/h)	657	641	1091	726	688	863	1636	1366				
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	11	37	237									
Volume Left	11	0	21									
Volume Right	0	37	63									
cSH	657	863	1636									
Volumes to Capacity	0.02	0.04	0.01									
Queue Length 95th (m)	0.4	1.0	0.3									
Control Delay (s)	10.6	9.4	0.7									
Lane LOS	B	A	A									
Approach Delay (s)	10.6	9.4	0.7									
Approach LOS	B	A	A									
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			26.3%									A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 30: Street 'J' & Site Laneway

04-04-2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	0	0	0	45	55
Future Volume (Veh/h)	20	0	0	0	45	55
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	0	0	0	47	58
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	152	0	0	0	0	0
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	152	0	0	0	0	0
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
p0 queue free %	3.5	3.3			2.2	
IF (s)	97	100			97	
p0 capacity (veh/h)	820	1091			1636	
Direction, Lane #	WB 1	SB 1				
Volume Total	21	105				
Volume Left	21	47				
Volume Right	0	0				
cSH	820	1636				
Volumes to Capacity	0.03	0.03				
Queue Length 95th (m)	0.6	0.7				
Control Delay (s)	9.5	3.4				
Lane LOS	A	A				
Approach Delay (s)	9.5	3.4				
Approach LOS	A	A				
Intersection Summary						
Average Delay		4.4				
Intersection Capacity Utilization		15.4%				
Analysis Period (min)		15				
ICU Level of Service						A

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 31: Street 'G' & Gerrard Street E

04-04-2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔			↔↔		↔
Traffic Volume (veh/h)	1035	0	0	580	0	10
Future Volume (Veh/h)	1035	0	0	580	0	10
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1089	0	0	611	0	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	171			81		
pX platoon unblocked	0.89			0.92		0.89
VC, conflicting volume	1089			1394		544
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	848			918		234
IC, single (s)	4.1			6.8		6.9
IC, 2 stage (s)						
p0 queue free %	2.2			3.5		3.3
IF (s)	100			100		98
CM capacity (veh/h)	709			254		687
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volumes Total	544	544	306	306	11	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	11	
cSH	1700	1700	1700	1700	687	
Volumes to Capacity	0.32	0.32	0.18	0.18	0.02	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.4	
Control Delay (s)	0.0	0.0	0.0	0.0	10.3	
Lane LOS					B	
Approach Delay (s)	0.0	0.0	0.0	10.3		
Approach LOS				B		
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	38.6%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2032 Future Total PM Model (Sensitivity)  
 32: Oak Street & Street 'G'

04-04-2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔			↔↔	↔
Traffic Volume (veh/h)	10	100	55	0	0	0
Future Volume (Veh/h)	10	100	55	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	105	58	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	58			185		58
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	58			185		58
IC, single (s)	4.1			6.4		6.2
IC, 2 stage (s)						
p0 queue free %	2.2			3.5		3.3
IF (s)	99			100		100
CM capacity (veh/h)	1559			803		1014
Direction, Lane #	EB 1	WB 1				
Volumes Total	116	58				
Volume Left	11	0				
Volume Right	0	0				
cSH	1559	1700				
Volumes to Capacity	0.01	0.03				
Queue Length 95th (m)	0.2	0.0				
Control Delay (s)	0.7	0.0				
Lane LOS	A					
Approach Delay (s)	0.7	0.0				
Approach LOS						
Intersection Summary						
Average Delay	0.5					
Intersection Capacity Utilization	15.8%					
ICU Level of Service	A					
Analysis Period (min)	15					



## Appendix H: Updated Signal Warrant Review



START TIME	VOL	START HOUR	HOURLY	PEDS	HOURLY P
07:00:00	102			2	
07:15:00	96			7	
07:30:00	117			10	
07:45:00	127	07:00:00	442	8	27
08:00:00	134	07:15:00	474	6	31
08:15:00	138	07:30:00	516	13	37
08:30:00	158	07:45:00	557	97	124
08:45:00	183	08:00:00	613	64	180
09:00:00	175	08:15:00	654	21	195
09:15:00	121	08:30:00	637	12	194
09:30:00	157	08:45:00	636	7	104
09:45:00	140	09:00:00	593	11	51
10:00:00	157	09:15:00	575	6	36
10:15:00	145	09:30:00	599	7	31
10:30:00	133	09:45:00	575	11	35
10:45:00	152	10:00:00	587	8	32
11:00:00	145	10:15:00	575	10	36
11:15:00	139	10:30:00	569	36	65
11:30:00	143	10:45:00	579	17	71
11:45:00	155	11:00:00	582	17	80
12:00:00	176	11:15:00	613	15	85
12:15:00	168	11:30:00	642	27	76
12:30:00	162	11:45:00	661	21	80
12:45:00	169	12:00:00	675	12	75
13:00:00	184	12:15:00	683	6	66
13:15:00	176	12:30:00	691	5	44
13:30:00	173	12:45:00	702	13	36
13:45:00	196	13:00:00	729	12	36
14:00:00	159	13:15:00	704	13	43
14:15:00	183	13:30:00	711	12	50
14:30:00	163	13:45:00	701	5	42
14:45:00	174	14:00:00	679	26	56
15:00:00	177	14:15:00	697	58	101
15:15:00	181	14:30:00	696	95	184
15:30:00	178	14:45:00	710	52	231
15:45:00	171	15:00:00	707	18	223
16:00:00	168	15:15:00	698	22	187
16:15:00	155	15:30:00	672	15	107
16:30:00	157	15:45:00	651	10	65
16:45:00	176	16:00:00	656	18	65
17:00:00	179	16:15:00	667	34	77
17:15:00	188	16:30:00	700	37	99
17:30:00	181	16:45:00	724	11	100
17:45:00	169	17:00:00	717	15	97

F\_TOTAL  
PED  
FACTOR  
2.5

07:00:00	442	27	70
08:00:00	613	180	450
09:00:00	593	51	130
10:00:00	587	32	80
11:00:00	582	80	200
12:00:00	675	75	190
13:00:00	729	36	90
14:00:00	679	56	140
15:00:00	707	223	560
16:00:00	656	65	165
17:00:00	717	97	245

FUTURE BACKGROUND TRAFFIC FORECASTS												
	NBL	NBT	NBR	EBL	EBT	EBR	SBL	SBT	SBR	WBL	WBT	WBR
84%	0	395	10				15	475		45		65
81%		382	10	0	0	0	15	460	0	44	0	63
93%		435	11	0	0	0	17	523	0	50	0	72
100%		470	12	0	0	0	18	565	0	54	0	77
95%		469	24	0	0	0	24	360		33		52
99%		488	25	0	0	0	25	375		35		54
91%		453	23	0	0	0	23	348		32		50
100%	0	495	25				25	380		35		55
8:00:00	0	395	10	0	0	0	15	475	0	45	0	65
9:00:00	0	382	10	0	0	0	15	460	0	44	0	63
12:00:00	0	435	11	0	0	0	17	523	0	50	0	72
13:00:00	0	470	12	0	0	0	18	565	0	54	0	77
14:00:00	0	469	24	0	0	0	24	360	0	33	0	52
15:00:00	0	488	25	0	0	0	25	375	0	35	0	54
16:00:00	0	453	23	0	0	0	23	348	0	32	0	50
17:00:00	0	495	25	0	0	0	25	380	0	35	0	55
FUTURE TOTAL TRAFFIC FORECASTS												
	NBL	NBT	NBR	EBL	EBT	EBR	SBL	SBT	SBR	WBL	WBT	WBR
84%	0	395	10				5	475		70		105
81%		382	10	0	0	0	5	460	0	68	0	102
93%		435	11	0	0	0	6	523	0	77	0	116
100%		470	12	0	0	0	6	565	0	83	0	125
95%		507	24	0	0	0	14	355		52		62
99%		528	25	0	0	0	15	370		54		64
91%		489	23	0	0	0	14	343		50		59
100%	0	535	25				15	375		55		65
8:00:00	0	395	10	0	0	0	5	475	0	70	0	105
9:00:00	0	382	10	0	0	0	5	460	0	68	0	102
12:00:00	0	435	11	0	0	0	6	523	0	77	0	116
13:00:00	0	470	12	0	0	0	6	565	0	83	0	125
14:00:00	0	507	24	0	0	0	14	355	0	52	0	62
15:00:00	0	528	25	0	0	0	15	370	0	54	0	64
16:00:00	0	489	23	0	0	0	14	343	0	50	0	59
17:00:00	0	535	25	0	0	0	15	375	0	55	0	65

# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

GO TO Justification:

What are the intersecting roadways?

Parliament Street / Oak Street (future background 2027)

What is the direction of the Main Road street?

North-South

When was the data collected?

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

2 or more

b.- Number of lanes on the Minor Road?

1

c.- How many approaches?

4

d.- What is the operating environment?

Urban

Population >= 10,000

AND

Speed < 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:00	0	395	10	0	0	0	15	475	0	45	0	65	180
9:00	0	382	10	0	0	0	15	460	0	44	0	63	51
12:00	0	435	11	0	0	0	17	523	0	50	0	72	75
13:00	0	470	12	0	0	0	18	565	0	54	0	77	36
14:00	0	469	24	0	0	0	24	360	0	33	0	52	56
15:00	0	488	25	0	0	0	25	375	0	35	0	54	223
16:00	0	453	23	0	0	0	23	348	0	32	0	50	65
17:00	0	495	25	0	0	0	25	380	0	35	0	55	97
<b>Total</b>	<b>0</b>	<b>3,587</b>	<b>140</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>162</b>	<b>3,486</b>	<b>0</b>	<b>328</b>	<b>0</b>	<b>488</b>	<b>783</b>

## Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

\* Include only collisions that are susceptible to correction through the installation of traffic signal control

## Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
<b>Total 8 hour pedestrian volume</b>		392		392					
<b>Factored 8 hour pedestrian volume</b>	392		392		0		0		
<b>% Assigned to crossing rate</b>	100%		100%						
<b>Net 8 Hour Pedestrian Volume at Crossing</b>									784
<b>Net 8 Hour Vehicular Volume on Street Being Crossed</b>									7,375

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
<b>Total 8 hour pedestrian volume</b>	0	392	0	392	0	0	0	0	
<b>Total 8 hour pedestrians delayed greater than 10 seconds</b>	0		0				0	0	
<b>Factored volume of total pedestrians</b>	392		392		0		0		
<b>Factored volume of delayed pedestrians</b>	0		0		0		0		
<b>% Assigned to Crossing Rate</b>	100%		100%		0%		0%		
<b>Net 8 Hour Volume of Total Pedestrians</b>									784
<b>Net 8 Hour Volume of Delayed Pedestrians</b>									0

**Justification 1: Minimum Vehicle Volumes**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	9:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
1A	480	720	600	900	1,005	974	1,108	1,196	962	1,002	929	1,015		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	110	107	122	131	85	89	82	90		
	COMPLIANCE %				65	63	72	77	50	52	48	53	480	60
<b>Restricted Flow</b>					Both 1A and 1B 100% Fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>Signal Justification 1:</b>					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

**Justification 2: Delay to Cross Traffic**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	9:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
2A	480	720	600	900	895	867	986	1,065	877	913	847	925		
	COMPLIANCE %				99	96	100	100	97	100	94	100	787	98
2B	50	75	50	75	225	95	125	90	89	258	97	132		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
<b>Restricted Flow</b>					Both 2A and 2B 100% Fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>Signal Justification 2:</b>					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 3: Combination**

**Combination Justification 1 and 2**

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Justification 2	Delay Cross Traffic	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	NOT JUSTIFIED	

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	12:00	986	122	199	61 %	54 %
	13:00	1,065	131	173	76 %	
	15:00	913	89	227	39 %	
	17:00	925	90	222	40 %	

# Results Sheet

Input Sheet

Analysis Sheet

Proposed Collision

Intersection: Parliament Street / Oak Street (Future Background 2) Count Date:

## Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	60 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	98 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	60 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Justification 2	98 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. 4-Hr Volume		54 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Collision Experience		0 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

GO TO Justification:

What are the intersecting roadways?

Parliament Street / Oak Street (future total 2032)

What is the direction of the Main Road street?

North-South

When was the data collected?

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

2 or more

b.- Number of lanes on the Minor Road?

1

c.- How many approaches?

4

d.- What is the operating environment?

Urban

Population >= 10,000

AND

Speed < 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:00	0	395	10	0	0	0	5	475	0	70	0	105	450
9:00	0	382	10	0	0	0	5	460	0	68	0	102	130
12:00	0	435	11	0	0	0	6	523	0	77	0	116	190
13:00	0	470	12	0	0	0	6	565	0	83	0	125	90
14:00	0	507	24	0	0	0	14	355	0	52	0	62	140
15:00	0	528	25	0	0	0	15	370	0	54	0	64	560
16:00	0	489	23	0	0	0	14	343	0	50	0	59	165
17:00	0	535	25	0	0	0	15	375	0	55	0	65	245
<b>Total</b>	<b>0</b>	<b>3,741</b>	<b>140</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>3,466</b>	<b>0</b>	<b>509</b>	<b>0</b>	<b>698</b>	<b>1,970</b>

## Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

\* Include only collisions that are susceptible to correction through the installation of traffic signal control

## Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
<b>Total 8 hour pedestrian volume</b>		985		985					
<b>Factored 8 hour pedestrian volume</b>	985		985		0		0		
<b>% Assigned to crossing rate</b>	100%		100%						
<b>Net 8 Hour Pedestrian Volume at Crossing</b>									1,970
<b>Net 8 Hour Vehicular Volume on Street Being Crossed</b>									7,427

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
<b>Total 8 hour pedestrian volume</b>	0	985	0	985	0	0	0	0	
<b>Total 8 hour pedestrians delayed greater than 10 seconds</b>	0		0				0	0	
<b>Factored volume of total pedestrians</b>	985		985		0		0		
<b>Factored volume of delayed pedestrians</b>	0		0		0		0		
<b>% Assigned to Crossing Rate</b>	100%		100%		0%		0%		
<b>Net 8 Hour Volume of Total Pedestrians</b>									1,970
<b>Net 8 Hour Volume of Delayed Pedestrians</b>									0

**Justification 1: Minimum Vehicle Volumes**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	9:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
1A	480	720	600	900	1,060	1,027	1,168	1,261	1,014	1,056	978	1,070		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	175	170	193	208	114	118	109	120		
	COMPLIANCE %				100	100	100	100	67	69	64	71	671	84
<b>Restricted Flow</b>					Both 1A and 1B 100% Fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>Signal Justification 1:</b>					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 2: Delay to Cross Traffic**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	9:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
2A	480	720	600	900	885	857	975	1,053	900	938	869	950		
	COMPLIANCE %				98	95	100	100	100	100	97	100	790	99
2B	50	75	50	75	520	198	267	173	192	614	215	300		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
<b>Restricted Flow</b>					Both 2A and 2B 100% Fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>Signal Justification 2:</b>					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 3: Combination**

**Combination Justification 1 and 2**

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
Justification 2	Delay Cross Traffic	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	JUSTIFIED	

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	12:00	975	193	203	95 %	76 %
	13:00	1,053	208	177	100 %	
	15:00	938	118	217	54 %	
	17:00	950	120	213	56 %	



# Results Sheet

Input Sheet

Analysis Sheet

Proposed Collision

Intersection: Parliament Street / Oak Street (Future Total 2032) Count Date:

## Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	84 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	99 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Road	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Combination	A Justificaton 1	84 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Justification 2	99 %	<input type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		76 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5. Collision Experience		0 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>

START TIME	VOL	START HOUR	HOURLY	PEDS	HOURLY P
07:00:00	98			16	
07:15:00	116			7	
07:30:00	128			5	
07:45:00	123	07:00:00	465	5	33
08:00:00	166	07:15:00	533	10	27
08:15:00	157	07:30:00	574	13	33
08:30:00	153	07:45:00	599	14	42
08:45:00	166	08:00:00	642	12	49
09:00:00	134	08:15:00	610	10	49
09:15:00	168	08:30:00	621	18	54
09:30:00	135	08:45:00	603	13	53
09:45:00	156	09:00:00	593	6	47
10:00:00	150	09:15:00	609	8	45
10:15:00	151	09:30:00	592	9	36
10:30:00	151	09:45:00	608	13	36
10:45:00	146	10:00:00	598	9	39
11:00:00	134	10:15:00	582	6	37
11:15:00	152	10:30:00	583	10	38
11:30:00	160	10:45:00	592	12	37
11:45:00	164	11:00:00	610	15	43
12:00:00	164	11:15:00	640	14	51
12:15:00	160	11:30:00	648	21	62
12:30:00	176	11:45:00	664	18	68
12:45:00	140	12:00:00	640	10	63
13:00:00	176	12:15:00	652	10	59
13:15:00	157	12:30:00	649	8	46
13:30:00	160	12:45:00	633	13	41
13:45:00	175	13:00:00	668	11	42
14:00:00	167	13:15:00	659	4	36
14:15:00	157	13:30:00	659	8	36
14:30:00	177	13:45:00	676	13	36
14:45:00	157	14:00:00	658	15	40
15:00:00	201	14:15:00	692	7	43
15:15:00	201	14:30:00	736	16	51
15:30:00	189	14:45:00	748	30	68
15:45:00	179	15:00:00	770	13	66
16:00:00	192	15:15:00	761	19	78
16:15:00	170	15:30:00	730	16	78
16:30:00	186	15:45:00	727	13	61
16:45:00	198	16:00:00	746	6	54
17:00:00	181	16:15:00	735	18	53
17:15:00	204	16:30:00	769	4	41
17:30:00	187	16:45:00	770	23	51
17:45:00	204	17:00:00	776	14	59

F\_TOTAL  
PED  
FACTOR  
2.5

07:00:00	465	33	85
08:00:00	642	49	125
09:00:00	593	47	120
10:00:00	598	39	100
11:00:00	610	43	110
12:00:00	640	63	160
13:00:00	668	42	105
14:00:00	658	40	100
15:00:00	770	66	165
16:00:00	746	54	135
17:00:00	776	59	150

FUTURE BACKGROUND TRAFFIC FORECASTS												
	NBL	NBT	NBR	EBL	EBT	EBR	SBL	SBT	SBR	WBL	WBT	WBR
8:00:00	0	375	25	40	0	15	40	525	0	35	0	65
9:00:00	0	356	24	38	0	14	38	499	0	33	0	62
10:00:00	0	374	25	40	0	15	40	523	0	35	0	65
11:00:00	0	390	26	42	0	16	42	546	0	36	0	68
12:00:00	0	369	34	72	4	38	42	475	0	17	0	42
13:00:00	0	432	40	84	5	45	50	556	0	20	0	50
14:00:00	0	418	38	82	5	43	48	538	0	19	0	48
15:00:00	0	435	40	85	5	45	50	560	0	20	0	50
16:00:00	0	375	25	40	0	15	40	525	0	35	0	65
17:00:00	0	356	24	38	0	14	38	499	0	33	0	62
8:00:00	0	374	25	40	0	15	40	523	0	35	0	65
9:00:00	0	390	26	42	0	16	42	546	0	36	0	68
10:00:00	0	369	34	72	4	38	42	475	0	17	0	42
11:00:00	0	432	40	84	5	45	50	556	0	20	0	50
12:00:00	0	418	38	82	5	43	48	538	0	19	0	48
13:00:00	0	435	40	85	5	45	50	560	0	20	0	50
14:00:00	0	375	25	40	0	15	40	525	0	35	0	65
15:00:00	0	356	24	38	0	14	38	499	0	33	0	62
16:00:00	0	374	25	40	0	15	40	523	0	35	0	65
17:00:00	0	390	26	42	0	16	42	546	0	36	0	68
8:00:00	0	369	34	72	4	38	42	475	0	17	0	42
9:00:00	0	432	40	84	5	45	50	556	0	20	0	50
10:00:00	0	418	38	82	5	43	48	538	0	19	0	48
11:00:00	0	435	40	85	5	45	50	560	0	20	0	50
12:00:00	0	375	25	40	0	15	40	525	0	35	0	65
13:00:00	0	356	24	38	0	14	38	499	0	33	0	62
14:00:00	0	374	25	40	0	15	40	523	0	35	0	65
15:00:00	0	390	26	42	0	16	42	546	0	36	0	68
16:00:00	0	369	34	72	4	38	42	475	0	17	0	42
17:00:00	0	432	40	84	5	45	50	556	0	20	0	50
8:00:00	0	418	38	82	5	43	48	538	0	19	0	48
9:00:00	0	435	40	85	5	45	50	560	0	20	0	50
10:00:00	0	375	25	40	0	15	40	525	0	35	0	65
11:00:00	0	356	24	38	0	14	38	499	0	33	0	62
12:00:00	0	374	25	40	0	15	40	523	0	35	0	65
13:00:00	0	390	26	42	0	16	42	546	0	36	0	68
14:00:00	0	369	34	72	4	38	42	475	0	17	0	42
15:00:00	0	432	40	84	5	45	50	556	0	20	0	50
16:00:00	0	418	38	82	5	43	48	538	0	19	0	48
17:00:00	0	435	40	85	5	45	50	560	0	20	0	50
8:00:00	0	375	25	40	0	15	40	525	0	35	0	65
9:00:00	0	356	24	38	0	14	38	499	0	33	0	62
10:00:00	0	374	25	40	0	15	40	523	0	35	0	65
11:00:00	0	390	26	42	0	16	42	546	0	36	0	68
12:00:00	0	369	34	72	4	38	42	475	0	17	0	42
13:00:00	0	432	40	84	5	45	50	556	0	20	0	50
14:00:00	0	418	38	82	5	43	48	538	0	19	0	48
15:00:00	0	435	40	85	5	45	50	560	0	20	0	50
16:00:00	0	375	25	40	0	15	40	525	0	35	0	65
17:00:00	0	356	24	38	0	14	38	499	0	33	0	62
8:00:00	0	374	25	40	0	15	40	523	0	35	0	65
9:00:00	0	390	26	42	0	16	42	546	0	36	0	68
10:00:00	0	369	34	72	4	38	42	475	0	17	0	42
11:00:00	0	432	40	84	5	45	50	556	0	20	0	50
12:00:00	0	418	38	82	5	43	48	538	0	19	0	48
13:00:00	0	435	40	85	5	45	50	560	0	20	0	50
14:00:00	0	375	25	40	0	15	40	525	0	35	0	65
15:00:00	0	356	24	38	0	14	38	499	0	33	0	62
16:00:00	0	374	25	40	0	15	40	523	0	35	0	65
17:00:00	0	390	26	42	0	16	42	546	0	36	0	68
8:00:00	0	369	34	72	4	38	42	475	0	17	0	42
9:00:00	0	432	40	84	5	45	50	556	0	20	0	50
10:00:00	0	418	38	82	5	43	48	538	0	19	0	48
11:00:00	0	435	40	85	5	45	50	560	0	20	0	50
12:00:00	0	375	25	40	0	15	40	525	0	35	0	65
13:00:00	0	356	24	38	0	14	38	499	0	33	0	62
14:00:00	0	374	25	40	0	15	40	523	0	35	0	65
15:00:00	0	390	26	42	0	16	42	546	0	36	0	68
16:00:00	0	369	34	72	4	38	42	475	0	17	0	42
17:00:00	0	432	40	84	5	45	50	556	0	20	0	50
8:00:00	0	418	38	82	5	43	48	538	0	19	0	48
9:00:00	0	435	40	85	5	45	50	560	0	20	0	50
10:00:00	0	375	25	40	0	15	40	525	0	35	0	65
11:00:00	0	356	24	38	0	14	38	499	0	33	0	62
12:00:00	0	374	25	40	0	15	40	523	0	35	0	65
13:00:00	0	390	26	42	0	16	42	546	0	36	0	68
14:00:00	0	369	34	72	4	38	42	475	0	17	0	42
15:00:00	0	432	40	84	5	45	50	556	0	20	0	50
16:00:00	0	418	38	82	5	43	48	538	0	19	0	48
17:00:00	0	435	40	85	5	45	50	560	0	20	0	50
8:00:00	0	375	25	40	0	15	40	525	0	35	0	65
9:00:00	0	356	24	38	0	14	38	499	0	33	0	62
10:00:00	0	374	25	40	0	15	40	523	0	35	0	65
11:00:00	0	390	26	42	0	16	42	546	0	36	0	68
12:00:00	0	369	34	72	4	38	42	475	0	17	0	42
13:00:00	0	432	40	84	5	45	50	556	0	20	0	50
14:00:00	0	418	38	82	5	43	48	538	0	19	0	48
15:00:00	0	435	40	85	5	45	50	560	0	20	0	50
16:00:00	0	375	25	40	0	15	40	525	0	35	0	65
17:00:00	0	356	24									

# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

GO TO Justification:

What are the intersecting roadways?

River Street / Oak Street (Future Background 2032)

What is the direction of the Main Road street?

North-South

When was the data collected?

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

1

b.- Number of lanes on the Minor Road?

1

c.- How many approaches?

4

d.- What is the operating environment?

Urban

Population >= 10,000

AND

Speed < 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:00	0	375	25	40	0	15	40	525	0	35	0	65	49
11:00	0	356	24	38	0	14	38	499	0	33	0	62	43
12:00	0	374	25	40	0	15	40	523	0	35	0	65	63
13:00	0	390	26	42	0	16	42	546	0	36	0	68	42
14:00	0	369	34	72	4	38	42	475	0	17	0	42	40
15:00	0	432	40	84	5	45	50	556	0	20	0	50	66
16:00	0	418	38	82	5	43	48	538	0	19	0	48	54
17:00	0	435	40	85	5	45	50	560	0	20	0	50	59
<b>Total</b>	<b>0</b>	<b>3,149</b>	<b>252</b>	<b>483</b>	<b>19</b>	<b>231</b>	<b>350</b>	<b>4,222</b>	<b>0</b>	<b>215</b>	<b>0</b>	<b>450</b>	<b>416</b>

## Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

\* Include only collisions that are susceptible to correction through the installation of traffic signal control

## Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume		208		208					
Factored 8 hour pedestrian volume	208		208		0		0		
% Assigned to crossing rate	100%		100%						
Net 8 Hour Pedestrian Volume at Crossing									416
Net 8 Hour Vehicular Volume on Street Being Crossed									7,973

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	208	0	208	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0		0				0	0	
Factored volume of total pedestrians	208		208		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	100%		100%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									416
Net 8 Hour Volume of Delayed Pedestrians									0

**Justification 1: Minimum Vehicle Volumes**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
1A	480	720	600	900	1,120	1,064	1,117	1,166	1,093	1,282	1,239	1,290		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	155	147	155	162	173	204	197	205		
	COMPLIANCE %				91	86	91	95	100	100	100	100	764	96
<b>Restricted Flow</b>					Both 1A and 1B 100% Fulfilled each of 8 hours								Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<b>Signal Justification 1:</b>					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 2: Delay to Cross Traffic**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
2A	480	720	600	900	965	917	962	1,004	920	1,078	1,042	1,085		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
2B	50	75	50	75	124	114	138	120	133	175	160	169		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
<b>Restricted Flow</b>					Both 2A and 2B 100% Fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Signal Justification 2:</b>					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 3: Combination**

**Combination Justification 1 and 2**

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
Justification 2	Delay Cross Traffic	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	JUSTIFIED	

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	13:00	1,004	104	101	100 %	100 %
	15:00	1,078	134	88	100 %	
	16:00	1,042	130	94	100 %	
	17:00	1,085	135	87	100 %	

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

Intersection: River Street / Oak Street (Future Background 2032) Count Date:

## Summary Results

Justification		Compliance		Signal Justified?	
				YES	NO
1. Minimum Vehicular Volume	A Total Volume	100	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Crossing Volume	96	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Crossing Road	100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Combination	A Justificaton 1	96	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Justification 2	100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		100	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>

5. Collision Experience	0	%	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

GO TO Justification:

What are the intersecting roadways?

River Street / Oak Street (Future Total 2032)

What is the direction of the Main Road street?

North-South

When was the data collected?

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

1

b.- Number of lanes on the Minor Road?

1

c.- How many approaches?

4

d.- What is the operating environment?

Urban

Population >= 10,000

AND

Speed < 70 km/hr

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:00	0	380	25	40	0	60	40	545	0	35	0	65	125
11:00	0	361	24	38	0	57	38	518	0	33	0	62	110
12:00	0	379	25	40	0	60	40	543	0	35	0	65	160
13:00	0	395	26	42	0	62	42	567	0	36	0	68	105
14:00	0	403	34	76	4	51	42	471	0	17	0	42	100
15:00	0	471	40	89	5	60	50	551	0	20	0	50	165
16:00	0	457	38	87	5	58	48	534	0	19	0	48	135
17:00	0	475	40	90	5	60	50	555	0	20	0	50	150
<b>Total</b>	<b>0</b>	<b>3,321</b>	<b>252</b>	<b>502</b>	<b>19</b>	<b>468</b>	<b>350</b>	<b>4,284</b>	<b>0</b>	<b>215</b>	<b>0</b>	<b>450</b>	<b>1,050</b>

## Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

\* Include only collisions that are susceptible to correction through the installation of traffic signal control

## Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
<b>Total 8 hour pedestrian volume</b>		525		525					
<b>Factored 8 hour pedestrian volume</b>	525		525		0		0		
<b>% Assigned to crossing rate</b>	100%		100%						
<b>Net 8 Hour Pedestrian Volume at Crossing</b>									1,050
<b>Net 8 Hour Vehicular Volume on Street Being Crossed</b>									8,207

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
<b>Total 8 hour pedestrian volume</b>	0	525	0	525	0	0	0	0	
<b>Total 8 hour pedestrians delayed greater than 10 seconds</b>	0		0				0	0	
<b>Factored volume of total pedestrians</b>		525		525	0		0		
<b>Factored volume of delayed pedestrians</b>	0		0		0		0		
<b>% Assigned to Crossing Rate</b>	100%		100%		0%		0%		
<b>Net 8 Hour Volume of Total Pedestrians</b>									1,050
<b>Net 8 Hour Volume of Delayed Pedestrians</b>									0

**Justification 1: Minimum Vehicle Volumes**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
1A	480	720	600	900	1,190	1,131	1,187	1,238	1,140	1,336	1,294	1,345		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	200	190	200	208	190	224	217	225		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
<b>Restricted Flow</b>					Both 1A and 1B 100% Fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Signal Justification 1:</b>					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 2: Delay to Cross Traffic**

**Restricted Flow Urban Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	8:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
2A	480	720	600	900	990	941	987	1,030	950	1,112	1,077	1,120		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
2B	50	75	50	75	200	181	235	183	197	279	246	265		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
<b>Restricted Flow</b>					Both 2A and 2B 100% Fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Signal Justification 2:</b>					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 3: Combination**

**Combination Justification 1 and 2**

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
Justification 2	Delay Cross Traffic	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	JUSTIFIED	

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	13:00	1,030	104	96	100 %	100 %
	15:00	1,112	154	83	100 %	
	16:00	1,077	150	88	100 %	
	17:00	1,120	155	81	100 %	



# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

Intersection: River Street / Oak Street (Future Total 2032)

Count Date:

## Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Crossing Volume	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Crossing Road	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Combination	A Justificaton 1	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Justification 2	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>

5. Collision Experience	0 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>