



City of Hamilton
PLANNING COMMITTEE REVISED

Meeting #: 19-008
Date: May 14, 2019
Time: 9:30 a.m.
Location: Council Chambers, Hamilton City Hall
71 Main Street West

Lisa Chamberlain, Legislative Coordinator (905) 546-2424 ext. 4605

	Pages
1. CEREMONIAL ACTIVITIES	
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- 8.1 David Partanen, Canadian Coalition for Firearm Rights, respecting Perspectives on the Efficacy of Proposed Federal Legislation and Municipal By-laws respecting Firearms (approved at the April 30th meeting) (No copy)
- 8.2 Glenn Wise, Macassa Bay Live-Aboard Association, respecting Obtaining Permanent Approval for Year Round Residency on a Boat (approved at the April 30th meeting) (No copy)
- 8.3 Applications for an Amendment to the Rural Hamilton Official Plan and the City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13) 436
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 - 13.1.a Items to be Removed:
 - P - Update to the Discharge of Firearms By-law (Item 10.1 on this agenda)

14. PRIVATE AND CONFIDENTIAL

15. ADJOURNMENT



PLANNING COMMITTEE

MINUTES 19-007

9:30 a.m.

Tuesday, April 30, 2019

Council Chambers

Hamilton City Hall

71 Main Street West

Present: Councillors M. Pearson (Chair), M. Wilson, J. Farr (1st Vice Chair), C. Collins, J.P. Danko, B. Clark, B. Johnson, T. Whitehead and J. Partridge

THE FOLLOWING ITEMS WERE REFERRED TO COUNCIL FOR CONSIDERATION:

1. By-law Enforcement Strategy Update (PED08263(c)) (City Wide) (Item 7.1)

(Clark/Partridge)

That the updated By-law Enforcement Priority Framework attached as Appendix "A" to Report PED08263(c), be approved.

Result: Motion CARRIED by a vote of 9 to 0, as follows:

YES – Councillor Maureen Wilson
YES – Councillor Jason Farr
YES – Councillor Chad Collins
YES – Councillor John-Paul Danko
YES – Councillor Maria Pearson
YES – Councillor Judi Partridge
YES – Councillor Terry Whitehead
YES – Councillor Brenda Johnson
YES – Councillor Brad Clark

2. Expanding Administrative Penalty System (APS) to Include the Sign By-law 10-197 (PED19092) (City Wide) (Item 7.2)

(Collins/Farr)

That the Administrative Penalty System By-law 17-225 (APS) be amended to include the Sign By-law 10-197 as Table 16 to Schedule A, in accordance with the amending by-law attached as Appendix "A" to Report PED19092 to be enacted by Council.

Result: Motion CARRIED by a vote of 9 to 0, as follows:

YES – Councillor Maureen Wilson
YES – Councillor Jason Farr
YES – Councillor Chad Collins
YES – Councillor John-Paul Danko
YES – Councillor Maria Pearson
YES – Councillor Judi Partridge
YES – Councillor Terry Whitehead
YES – Councillor Brenda Johnson
YES – Councillor Brad Clark

3. By-law No. 18-261 – Correction of Typographical Errors for Lands Located at 5 Hamilton Street North, Flamborough (PED18179(a)) (Ward 15) (Item 7.3)

(Partridge/Danko)

- (a) That By-law No. 18-261, respecting 5 Hamilton Street North, Flamborough be amended to correct one error and to add two administrative clauses, on the following basis:
- (i) That Section 3 (d) of By-law 18-261 be amended by deleting the word “east” and replacing it with “north”;
 - (ii) The following two administrative sections be added to By-law 18-261 as clauses 5 and 6:
 - 5. That the Clerk is hereby authorized and directed to proceed with the giving of notice of the passing of this By-law, in accordance with the Planning Act; and,
 - 6. That no building or structure shall be erected, extended or enlarged, nor shall any building or structure or part thereof be used, nor shall any land be used, except in accordance with the Mixed Use – Medium Density (C5) Zone provisions, subject to the special requirements as referred to in Section 2 of this By-law.
- (b) That the draft By-law attached as Appendix “B” to Report PED18179(a), which has been prepared in a form satisfactory to the City Solicitor, be enacted by City Council; and,
- (c) That the proposed amendment is consistent with the Provincial Policy Statement (2014) and conforms to the Growth Plan for the Greater Golden Horseshoe (2017) and the Urban Hamilton Official Plan.

Result: Motion CARRIED by a vote of 9 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

4. Hamilton Municipal Heritage Committee Report 19-003 (Item 7.4)

(Farr/Johnson)

1. Inventory and Research Working Group Meeting Notes – March 25, 2019 (Item 10.1)

- (a) That the recommendations in the Inventory and Research Working Group Meeting Notes of March 25, 2019, be approved as presented; and,
- (b) That the following properties be added to the City Register of Non-designated Properties of Cultural Heritage Value or Interest, and to the staff work plan:
 - 1. 745 Crooks' Hollow Road, Dundas
 - 2. 7 Rolph Street, Dundas
 - ~~3. **23-25 King Street East, Stoney Creek**~~
 - 4. 45 Amelia Street, Hamilton

2. Hamilton Municipal Heritage Committee Heritage Recognition Awards Update (Item 10.2)

That the Nominations for the 2018 Hamilton Municipal Heritage Committee Heritage Recognition Awards, attached hereto as Appendix "A" and Appendix "B", be approved, as amended.

Result: Main Motion, As Amended, CARRIED by a vote of 9 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

5. Applications to Amend the Urban Hamilton Official Plan, the Township of Glanbrook Zoning By-law No. 464, the City of Hamilton Zoning By-law No. 05-200, and for Approval of a Draft Plan of Subdivision for Lands Located at 78 and 80 Marion Street and 3302 and 3306 Homestead Drive, Glanbrook (PED19046) (Ward 11) (Item 8.1)

(Johnson/Clark)

- (a) That Urban Hamilton Official Plan Amendment Application UHOPA-18-01 by Branthaven Mount Hope Inc., Owner, is to amend the Mount Hope Secondary Plan from “Neighbourhood Park”, “Low Density Residential 2c”, “Institutional” and “Utility” to “Low Density Residential 2”; from “Low Density Residential 2” to “Utility”; from “Low Density Residential 2” to “Natural Open Space”; and, from “Utility” to “Natural Open Space”. The amendment will also add a Site Specific Policy Area in order to permit residential development between 28 and 30 NEF contour lines; and, establish new local roads, for the lands located at 78 and 80 Marion Street and 3302 and 3306 Homestead Drive (Glanbrook), as shown on Appendix “A” to Report PED19046, to be APPROVED, on the following basis:
- (i) That the draft Official Plan Amendment, attached as Appendix “B” to Report PED19046, which has been prepared in a form satisfactory to the City Solicitor, be enacted by City Council; and,
 - (ii) That the proposed amendment is consistent with the Provincial Policy Statement (2014) and conforms to the Growth Plan for the Greater Golden Horseshoe (2017).
- (b) That Amended Zoning By-law Amendment Application ZAC-18-003 by Branthaven Mount Hope Inc., (Owner), for changes in zoning from the Deferred Development “DD” Zone, Existing Residential “ER” Zone, Residential “H-R3-122” Zone and Public “P” Zone to Residential “R4-312” Zone, Modified for Blocks 1, 4, 6 - 8 and Residential “R4-312a” Zone, Modified for Blocks 4 and 5 in Zoning By-law No. 464; for lands located at 78 and 80 Marion Street and 3302 and 3306 Homestead Drive (Glanbrook), as shown on Appendix “A” to Report PED19046, be APPROVED on the following basis:
- (i) That the draft By-law, attached as Appendix “C” to Report PED19046, which has been prepared in a form satisfactory to the City Solicitor, be enacted by City Council;
 - (ii) That the proposed changes in zoning are consistent with the Provincial Policy Statement (PPS) and conform to the Growth Plan for the Greater Golden Horseshoe (2017); and,
 - (iii) That the proposed changes in zoning comply with the Urban Hamilton Official Plan upon finalization of Urban Hamilton Official Plan Amendment No. XX.

- (c) That Zoning By-law Amendment Application ZAC-18-003 by Branthaven Mount Hope Inc., (Owner), for a change in zoning from the Deferred Development “DD” Zone to the Conservation / Hazard Land (P5) Zone, Modified (Blocks 125 and 126) to recognize the Natural Heritage System and vegetation protection zone and add a specific exception to permit a reduced setback from any building or structure to the Conservation / Hazard Land (P5) Zone, Modified, in Zoning By-law No. 05-200; for lands located 78 and 80 Marion Street and 3302 and 3306 Homestead Drive (Glanbrook), as shown on Appendix “A” to Report PED19046, be APPROVED on the following basis:
- (i) That the draft By-law, attached as Appendix “D” to Report PED19046, which has been prepared in a form satisfactory to the City Solicitor, be enacted by City Council;
 - (ii) That the proposed changes in zoning are consistent with the Provincial Policy Statement (PPS) and conform to the Growth Plan for the Greater Golden Horseshoe (2017); and,
 - (iii) That the proposed changes in zoning comply with the Urban Hamilton Official Plan upon finalization of Urban Hamilton Official Plan Amendment No. XX.
- (d) That Draft Plan of Subdivision Application 25T-201801 by Branthaven Mount Hope Inc., (Owner), to establish a Draft Plan of Subdivision on lands located at 78 and 80 Marion Street and 3302 and 3306 Homestead Drive (Glanbrook), as shown in Appendix “E” to Report PED19046, be APPROVED subject to the following:
- (i) That this approval apply to the Draft Plan of Subdivision “Branthaven Mount Hope” 25T-201801, prepared by Urban Solutions Planning & Land Development Consultants Inc., and certified by Dan McLaren, O.L.S., dated November 28, 2018, consisting of a maximum of 123 lots for single detached dwellings (Lots 1 - 123), one block for a 0.3 metre road reserve (Block 124), one block for a storm sewer connection and walkway (Block 125), one block for open space purposes (Block 126), and three proposed public streets, shown as Streets “A,” “B” and “C”, subject to the Owner entering into a standard form subdivision agreement as approved by City Council and will Special Conditions attached as Appendix “F” to Report PED19046.
 - (ii) Acknowledgement by the City of Hamilton of its responsibility for cost-sharing with respect to this development shall be in accordance with the City’s Financial Policies and will be determined at the time of development; and,
 - (iii) That payment of Cash-in-Lieu of Parkland will be required, pursuant to Section 51 of the *Planning Act*, prior to the issuance of each

building permit. The calculation for the Cash-in-Lieu payment shall be based on the value of the lands on the day prior to the issuance of each building permit, all in accordance with the Financial Policies for Development and the City's Parkland Dedication By-law, as approved by Council.

(e) That the public submissions received did not affect the decision.

Result: Main Motion, As Amended, CARRIED by a vote of 8 to 1, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NO – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

6. Application for a Zoning By-law Amendment for Lands Located at 122 and 126 Augusta Street and 127 Young Street and 125 Young Street, Hamilton (PED19089) (Ward 2) (Item 8.2)

(Farr/Collins)

- (a) That the Amended Zoning By-law Amendment Application ZAC-18-013, by 1955132 Ontario Ltd., Owner, for a change in zoning from the "D" (Urban Protected Residential – One and Two Family Dwellings, Etc.) District to the "E-3/S-1767" (High Density Multiple Dwellings) District, Modified and the "D/S-1767" (Urban Protected Residential – One and Two Family Dwellings, Etc.) District, Modified to permit a four storey, 27 unit multiple dwelling and a three family dwelling on lands located at 122 & 126 Augusta Street and 127 Young Street, and 125 Young Street, Hamilton as shown on Appendix "A" to Report PED19089 be APPROVED on the following basis:
- (i) That the draft By-law, attached as Appendix "B" to Report PED19089 which has been prepared in a form satisfactory to the City Solicitor, be enacted by City Council;
 - (ii) That the amending By-law, attached as Appendix "B" to Report PED19089 be added to District Map E5 of Zoning By-law No. 6593 as "E-3/S-1767" and "D/S-1767";
 - (iii) That the amending By-law apply the Holding Provisions of Section 36(1) of the *Planning Act*, R.S.O. 1990 to the subject lands by introducing the Holding Symbol 'H' as a suffix to the proposed zoning for Blocks 1, 3 and 4 as shown on Schedule "A" of Appendix "B" to Report PED19089;

The Holding Provision “E-3/S-1767-H” (High Density Multiple Dwellings) District, Modified, Holding applicable to Block 1 as shown on Schedule “A” of Appendix “B” to Report PED19089, be removed conditional upon:

- (1) The Owner conduct a Stage 3 Archaeological Assessment, and Stage 4 Archaeological Assessment if required, for the site and receive approval of this / these report(s) from the Ministry of Tourism, Culture and Sport and the City of Hamilton, to the satisfaction of the Manager of Development Planning, Heritage and Design.

The Holding provision “D/S-1767-H” (Urban Protected Residential – One and Two Family Dwellings, Etc.) District, Modified, Holding applicable to Block 3 as shown on Schedule “A” of Appendix “B” to Report PED19089, be removed conditional upon:

- (1) The Owner apply for a Building Permit to legalize the existing three family dwelling, to the satisfaction of the City’s Chief Building Official.

The Holding Provision “D/S-1767-H” (Urban Protected Residential – One and Two Family Dwellings, Etc.) District, Modified, Holding applicable to Block 4 as shown on Schedule “A” of Appendix “B” to Report PED19089, be removed conditional upon:

- (1) The Owner conduct a Stage 3 Archaeological Assessment, and Stage 4 Archaeological Assessment if required, for the site and receive approval of this / these report(s) from the Ministry of Tourism, Culture and Sport and the City of Hamilton, to the satisfaction of the Manager of Development Planning, Heritage and Design.
- (iv) That the proposed change in zoning is consistent with the Provincial Policy Statement (2014), conforms to the Growth Plan for the Greater Golden Horseshoe (2017) and complies with the Urban Hamilton Official Plan.
- (b) That upon finalization of the amending By-law, that the subject lands be re-designated from “Single and Double” to “Medium Density Apartments” in the Corktown Neighbourhood Plan;
- (c) ***That there were no public submissions received regarding this matter.***

Result: Main Motion, As Amended, CARRIED by a vote of 7 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NOT PRESENT – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

7. Entertainment on Outdoor Commercial Patios – Extension and Establishment of the Temporary Use By-laws (PED16155(b)) (City Wide) (Item 8.3)

(Farr/Collins)

- (a) That approval be given to City Initiative CI-17-C to extend Temporary Use By-laws Nos. 17-083, and 17-255, under Zoning By-law No. 05-200 for a period of 36 months, to allow for commercial entertainment/recreation, including live or recorded music and dance facilities on Outdoor Commercial Patios for four urban pilot project areas: Downtown Hamilton, Hess Village, parts of Upper James Street (Stone Church Road to Rymal Road), and Dundas; and some properties within the Rural area on the following basis:
- (i) That the draft Temporary Use By-laws, attached as Appendices “A” and “B” to Report PED16155(b) for the five pilot project areas and the rural area, be approved by City Council; and,
 - (ii) That the draft Temporary Use By-laws are consistent with the Provincial Policy Statement (PPS) 2014, conform to the 2017 Growth Plan for the Greater Golden Horseshoe, and comply with the Rural (RHOP) and Urban Hamilton Official Plans (UHOP).
- (b) That approval be given to City Initiative CI-17-C to extend Temporary Use By-laws No. 17-082 under Zoning By-law No. 6593 for a period of 36 months, to allow for commercial entertainment/recreation, including live or recorded music and dance facilities on Outdoor Commercial Patios for two urban pilot project areas on James Street North and James Street South, on the following basis:
- (i) That draft Temporary Use By-law, attached as Appendix “C” to Report PED16155(b) for the James Street North and James Street South pilot project areas, be approved by City Council; and,
 - (ii) That the draft Temporary Use By-law is consistent with the Provincial Policy Statement (PPS) 2014, conforms to the 2017 Growth Plan for the Greater Golden Horseshoe and complies with the Urban Hamilton Official Plan (UHOP).

- (c) That approval be given to City Initiative CI-17-C to establish a Temporary Use By-law in Zoning By-law No. 05-200 for a period of 36 months, to allow for commercial entertainment/recreation, including live or recorded music and dance facilities on Outdoor Commercial Patios for two urban pilot project areas: James Street North and James Street South / Augusta Street, on the following basis:
 - (i) That the Temporary Use By-law, attached as Appendix “D” to Report PED16155(b) for James Street North and James Street South / Augusta Street pilot areas, be approved by City Council; and,
 - (ii) That the draft Temporary Use By-law is consistent with the Provincial Policy Statement (PPS) 2014, conforms to the 2017 Growth Plan for the Greater Golden Horseshoe and complies the Urban Hamilton Official Plan (UHOP);

(d) That there were no public submissions received regarding this matter.

Result: Main Motion, As Amended, CARRIED by a vote of 7 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NOT PRESENT – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

8. Residential Care Facilities and Group Homes (Urban Area) – Human Rights and the Zoning By-law Discussion Paper (CI 19-B) (PED19091) (City Wide) (Item 9.1)

(Farr/Whitehead)

- (a) That Report PED19091 (City Initiative CI-19-B), including the Discussion Paper titled Residential Care Facilities and Group Homes - Human Rights and the Zoning By-Laws within the Urban Area - March 2019, attached as Appendix “A” to Report PED19091 be received;
- (b) ***That the Residential Care Facilities and Group Homes (Urban Area) – Human Rights and the Zoning By-law Discussion Paper be posted on the City’s website and invite written submissions on the proposed Zoning By-law regulation and definition changes for a period of 30 days, with staff reporting back to the Planning Committee on the written submissions received. In the event that additional public engagement is necessary, it would be included with other housing issues as part of the residential zoning project; and,***

- (c) That staff report back to the Planning Committee summarizing public input and identifying the preferred zoning definition and regulations for residential care facilities and group homes to be incorporated into the new residential zones in Zoning By-law No. 05-200.

Result: Main Motion, As Amended, CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

9. Amendments to Property Standards By-law 10-221 and Yard Maintenance By-law 10-118 to Include Tree Requirements (PED19088) (City Wide) (Item 10.1)

(Collins/Farr)

- (a) That the procedural and housekeeping changes to the City of Hamilton Property Standards By-law 10-221 and Yard Maintenance By-law 10-118 regarding the maintenance requirements for trees and the definition of Directors described in Report PED19088, detailed in the proposed amending by-law attached as Appendix “A” be approved; and,
- (b) That the amending by-law attached as Appendix “A” to Report PED19088, which has been prepared in a form satisfactory to the City Solicitor be enacted by Council.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

**10. Tree Service Company Licensing Feasibility Report (PED19008) (City Wide)
(Item 10.2)**

(Whitehead/Farr)

- (a) That Council adopt this Report and direct staff to draft a new licensing schedule (Tree Service Company) within the Business Licensing By-law 07-170 and bring it back in a form satisfactory to the City Solicitor for enactment; and,
- (b) That the item respecting the feasibility of implementing a By-law that will ensure that any commercial company that is contracted to remove trees within the City of Hamilton has a City Business Licence, be identified as complete and removed from the Planning Committee Outstanding Business List.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

11. Licensing and By-law Services, Technology “Add-On” (PED19090) (City Wide) (Added Item 10.3)

(Farr/Partridge)

- (a) That Council approve the single source procurement, pursuant to Procurement Policy #11 – Non-competitive Procurements, for the procurement of a by-law enforcement module (“add-on” to the existing parking system) and hardware, including printers, associated custom application development, system implementation and training, for the purpose of issuance and tracking of Licensing and By-Law Services penalties in the City of Hamilton and that the General Manager of the Planning and Economic Development Department be authorized to negotiate, enter into and execute a Contract and any ancillary documents required to give effect thereto with gtechna, a Division of ACCEO Solutions Inc., in a form satisfactory to the City Solicitor; and,
- (b) That the General Manager of Planning and Economic Development be authorized to appropriate \$145,000 from the Capital Project Account No. 4901445100, Parking Lots-Service Repairs to the 2019 approved Capital Project Account No. 4501957900, Handheld Ticketing Device-System Integration.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

12. Ways to Better Protect Hamilton Trees on Private Property (Added Item 12.2)

(Farr/Collins)

WHEREAS, the City of Hamilton has unanimously declared a Climate Emergency;

WHEREAS, trees are like the lungs of the planet. They breathe in carbon dioxide and breathe out oxygen. Additionally, they provide habitat for birds and other wildlife. They control flooding and improve water quality;

WHEREAS, Forests Ontario's "50 million tree" program, which aimed to plant that many trees by 2025 and has helped 4,000 landowners in rural Ontario by subsidizing the planting of 2.3 million trees annually is being eliminated in July by the current Ontario Government;

WHEREAS, the City of Hamilton currently has a by-law to protect trees on municipally owner lands;

WHEREAS, our current City of Hamilton By-laws only protect trees on private property within woodlands 0.5 acres in size or more, with limited protection in Ancaster, Dundas, and Stoney Creek for individual trees;

WHEREAS, the City of Hamilton's Tree Protection Guidelines, adopted by Council in 2010, provide a process for protecting trees on private lands as part of a *Planning Act* application; and,

WHEREAS, the City's existing urban tree canopy is under threat from invasive species;

THEREFORE BE IT RESOLVED;

That the appropriate staff from Planning and Economic Development provide a verbal update on the Urban Forest Strategy to the Planning Committee before the June 2019 public consultation on the Urban Forest Strategy; and that the update include ways we may better protect trees on private property.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

13. Zoning By-law Amendment for 1400 Baseline Road (Added Item 12.1)

(Pearson/Whitehead)

WHEREAS the City owns the property located at 1400 Baseline Road; and,

WHEREAS City Council has declared the lands surplus to the requirements of the City and authorized and directed Real Estate staff to sell the lands;

THEREFORE BE IT RESOLVED:

- (a) That staff be directed to investigate amending the Urban Lakeshore Secondary Plan (Urban Hamilton Official Plan) and the City of Stoney Creek Zoning by-law No. 3692-92, for the purpose of updating the planning permissions for the lands and establishing a land use designation and zoning requirements that reflect the highest/best use of the land;
- (b) That staff be directed to prepare a report and implementing by-laws for the approval of Planning Committee;
- (c) That staff be directed to provide adequate public notice pertaining to item (b) above, in accordance with the Planning Act; and,
- (d) That the General Issues Committee's Outstanding Business List item "Tourism Gateway Centre in Winona" be considered complete and removed.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

FOR INFORMATION:

(a) APPROVAL OF THE AGENDA (Item 2)

The Committee Clerk advised of the following changes to the agenda:

1. COMMUNICATIONS (Item 5)

- 5.1 Correspondence from Lakewood Beach Community Council respecting 310 Frances Avenue and the April 16th Planning Committee meeting

2. DELEGATION REQUESTS (Item 6)

- 6.2 Mark Clem respecting 45 Amelia Street being added to the Municipal Register of Properties of Cultural Heritage Value or Interest (Item 7.4) (For today's meeting)
- 6.3 David Partanen, Canadian Coalition for Firearm Rights, respecting Perspectives on the Efficacy of Proposed Federal Legislation and Municipal By-laws respecting Firearms (For the May 14th meeting)

3. PUBLIC HEARINGS / DELEGATIONS (Item 8)

- 8.1 Applications to Amend the Urban Hamilton Official Plan, the Township of Glanbrook Zoning By-law No. 464, the City of Hamilton Zoning By-law No. 05-200, and for Approval of a Draft Plan of Subdivision for Lands Located at 78 and 80 Marion Street and 3302 and 3306 Homestead Drive, Glanbrook (PED19046) (Ward 11)

(b) Written Comments:

- (i) Rose and Russ Bartolini
(ii) Donald and Ann Pryer
(iii) Dena Jones
(iv) M. P. Butt

4. DISCUSSION ITEMS (Item 10)

- 10.3 Licensing and By-law Services, Technology "Add-On" (PED19090) (City Wide)

5. NOTICES OF MOTION (Item 12)

- 12.1 Zoning By-law Amendments for 1400 Baseline Road
- 12.2 Ways to Better Protect Hamilton Trees on Private Property

(Whitehead/Partridge)

That the agenda for the April 30, 2019 meeting be approved, as amended.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 NOT PRESENT – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

(b) DECLARATIONS OF INTEREST (Item 3)

None declared.

(c) APPROVAL OF THE MINUTES OF THE PREVIOUS MEETING (Item 4)

(i) April 16, 2019 (Item 4.1)

(Farr/Wilson)

That the Minutes of the April 16, 2019 meeting be approved, as presented.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 NOT PRESENT – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

(d) COMMUNICATIONS (Item 5)

(i) Correspondence from the Lakewood Beach Community Council respecting 310 Frances Street and the April 16 Planning Committee meeting (Added Item 5.1)

(Whitehead/Clark)

That the Correspondence from the Lakewood Beach Community Council respecting 310 Frances Street and the April 16 Planning Committee meeting, be deferred to the May 14, 2019 Planning Committee meeting.

CARRIED

(e) DELEGATION REQUESTS (Item 6)

- (i) Glenn Wise, Macassa Bay Live-Aboard Association, respecting Obtaining Permanent Approval for Year Round Residency on a Boat (For today's meeting) (Item 6.1)**

(Farr/Collins)

That the Delegation Request from Glenn Wise, Macassa Bay Live-Aboard Association, respecting Obtaining Permanent Approval for Year Round Residency on a Boat, be approved for today's meeting.

Result: Motion CARRIED by a vote of 9 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

- (ii) Mark Clem respecting 45 Amelia Street being added to the Municipal Register of Properties of Cultural Heritage Value or Interest (Item 7.4) (For today's meeting) (Added Item 6.2)**

(Farr/Danko)

That the Delegation Request from Mark Clem respecting 45 Amelia Street being added to the Municipal Register of Properties of Cultural Heritage Value or Interest, be approved for today's meeting, to be heard before Item 7.4.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 NOT PRESENT – Councillor Brenda Johnson
 YES – Councillor Brad Clark

- (iii) **David Partanen, Canadian Coalition for Firearm Rights, respecting Perspectives on the Efficacy of Proposed Federal Legislation and Municipal By-laws respecting Firearms (For the May 14th meeting) (Added Item 6.3)**

(Clark/Whitehead)

That the Delegation Request from David Partanen, Canadian Coalition for Firearm Rights, respecting Perspectives on the Efficacy of Proposed Federal Legislation and Municipal By-laws respecting Firearms, be approved for the May 14, 2019 meeting.

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 NOT PRESENT – Councillor Brenda Johnson
 YES – Councillor Brad Clark

(f) PUBLIC HEARINGS / DELEGATIONS (Item 8)

- (i) **Mark Clem respecting 45 Amelia Street being added to the Municipal Register of Properties of Cultural Value or Interest (Added Item 8.5)**

Mark Clem addressed the Committee respecting concerns with 45 Amelia Street being added to the Municipal Register of Properties of Cultural Value or Interest.

(Clark/Johnson)

That the Delegation from Mark Clem respecting 45 Amelia Street being added to the Municipal Register of Properties of Cultural Value or Interest, be received.

CARRIED

(g) CONSENT ITEMS (Item 7)

- (i) **Hamilton Municipal Heritage Committee Report 19-003 (Item 7.4)**

(Collins/Farr)

(a) That Item 1 (b) (3) to Hamilton Municipal Heritage Committee Report 19-003 be amended as follows:

3. 23-~~35~~ **25** King Street East, Stoney Creek

- (b) That Item 1 (b) (3) to Hamilton Municipal Heritage Committee Report 19-003, respecting the property located at 23-25 King Street East, be Deferred to the next Planning Committee meeting.

Result: Amendment CARRIED by a vote of 9 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

For disposition of this matter, refer to Item 4.

(h) PUBLIC HEARINGS / DELEGATIONS (Item 8) - CONTINUED

- (i) Applications to Amend the Urban Hamilton Official Plan, the Township of Glanbrook Zoning By-law No. 464, the City of Hamilton Zoning By-law No. 05-200, and for Approval of a Draft Plan of Subdivision for Lands Located at 78 and 80 Marion Street and 3302 and 3306 Homestead Drive, Glanbrook (PED19046) (Ward 11) (Item 8.1)**

In accordance with the provisions of the *Planning Act*, Chair Pearson advised those in attendance that if a person or public body does not make oral submissions at a public meeting or make written submissions to the Council of the City of Hamilton before Council makes a decision regarding the Official Plan Amendment, Zoning By-law Amendment or Draft Plan of Subdivision the person or public body is not entitled to appeal the decision of the Council of the City of Hamilton to the Local Planning Appeal Tribunal, and the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to do so.

Jennifer Roth, Planner I, addressed the Committee with the aid of a PowerPoint presentation. A copy of the presentation is available on the City's website at www.hamilton.ca or through the Office of the City Clerk.

(Johnson/Clark)

That the staff presentation be received.

CARRIED

Matt Johnston, Urban Solutions, agent for the applicant was in attendance and indicated that the applicant is in agreement with the staff report. Matt Johnston provided an overview of the proposal.

(Johnson/Clark)

That the overview of the proposal by Matt Johnston, Urban Solutions, be received.

CARRIED

Delegations:

1. Donald and Ann Pryer, 42 Aberdeen Avenue, Hamilton

Donald and Ann Pryer addressed the Committee in opposition to the proposal.

2. Margaret Butt, 3266 Homestead Drive, Hamilton

Margaret Butt addressed the Committee in opposition to the proposal.

3. Joanne Fenbow, 3260 Homestead Drive, Hamilton

Joanne Fenbow addressed the Committee in opposition to the proposal.

4. Jochen Bezner, 21 Grosvenor Avenue South, Hamilton

Jochen Bezner addressed the Committee in opposition to the proposal.

(Johnson/Clark)

That the delegations, be received.

CARRIED

(Johnson/Clark)

That the following written submissions, be received:

- (i) Rose and Russ Bartolini
- (ii) Donald and Ann Pryer
- (iii) Dena Jones
- (iv) M. P. Butt

CARRIED

(Johnson/Farr)

That the public meeting be closed.

CARRIED

(Johnson/Clark)

That the recommendations in Report PED19046 be amended by adding the following sub-section (e):

- (e) ***That the public submissions received did not affect the decision.***

Result: Amendment CARRIED by a vote of 8 to 1, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NO – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 YES – Councillor Brad Clark

For disposition of this matter, refer to Item 5.

- (ii) **Application for a Zoning By-law Amendment for Lands Located at 122 and 126 Augusta Street and 127 Young Street and 125 Young Street, Hamilton (PED19089) (Ward 2) (Item 8.2)**

In accordance with the provisions of the *Planning Act*, Chair Pearson advised those in attendance that if a person or public body does not make oral submissions at a public meeting or make written submissions to the Council of the City of Hamilton before Council makes a decision regarding the Zoning By-law Amendment the person or public body is not entitled to appeal the decision of the Council of the City of Hamilton to the Local Planning Appeal Tribunal, and the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to do so.

No members of the public came forward.

(Farr/Collins)

That the Public Meeting be closed.

CARRIED

Mark Kehler, Planner II, addressed the Committee with the aid of a PowerPoint presentation. A copy of the presentation is available on the City's website at www.hamilton.ca or through the Office of the City Clerk.

(Farr/Collins)

That the staff presentation be received.

CARRIED

Matt Johnston, Urban Solutions, agent for the applicant was in attendance and indicated that the applicant is in agreement with the staff report. Matt Johnston provided an overview of the proposal.

(Farr/Whitehead)

That the overview of the proposal by Matt Johnston, Urban Solutions, be received.

CARRIED

(Farr/Collins)

That the recommendations in Report PED19089 be amended by adding the following sub-section (c):

- (c) *That there were no public submissions received regarding this matter.***

Result: Amendment CARRIED by a vote of 7 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NOT PRESENT – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

For disposition of this matter, refer to Item 6.

(iii) Entertainment on Outdoor Commercial Patios – Extension and Establishment of the Temporary Use By-laws (PED16155(b)) (City Wide) (Item 8.3)

In accordance with the provisions of the *Planning Act*, Chair Pearson advised those in attendance that if a person or public body does not make oral submissions at a public meeting or make written submissions to the Council of the City of Hamilton before Council makes a decision regarding the Zoning By-law Amendment the person or public body is not entitled to appeal the decision of the Council of the City of Hamilton to the Local Planning Appeal Tribunal, and the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to do so.

No members of the public came forward.

(Whitehead/Farr)

That the public meeting be closed.

CARRIED

(Whitehead/Farr)

That the staff presentation be waived.

CARRIED

(Farr/Collins)

That the recommendations in Report PED16155(b) be amended by adding the following sub-section (d):

- (d) *That there were no public submissions received regarding the matter.***

Result: *Amendment* CARRIED by a vote of 7 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NOT PRESENT – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES– Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

For disposition of this matter, refer to Item 7.

- (iv) Glenn Wise, Macassa Bay Live-Aboard Association, respecting Obtaining Permanent Approval for Year Round Residency on a Boat (For today's meeting) (Item 8.4)**

Glenn Wise was not in attendance when called to speak. Staff advised that Glenn Wise may have thought he was to attend the May 14, 2019 Planning Committee meeting.

(Collins/Whitehead)

That the Delegation by Glenn Wise, Macassa Bay Live-Aboard Association, respecting Obtaining Permanent Approval for Year Round Residency on a Boat, be deferred to the May 14, 2019 Planning Committee meeting.

Result: Motion CARRIED by a vote of 7 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 NOT PRESENT – Councillor John-Paul Danko

YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES– Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

(i) STAFF PRESENTATIONS (Item 9)

(i) Residential Care Facilities and Group Homes (Urban Area) – Human Rights and the Zoning By-law Discussion Paper (CI 19-B) (PED19091) (City Wide) (Item 9.1)

Joanne Hickey-Evans, Manager Policy Planning and Zoning By-law Reform, addressed the Committee with aid of a PowerPoint presentation.

A copy of the presentation is available on the City's website at www.hamilton.ca or through the Office of the City Clerk.

(Farr/Whitehead)

That the staff presentation be received.

CARRIED

(Farr/Whitehead)

That recommendation (b) of Report PED19091 be deleted in its entirety and replaced with the following:

~~(b) That staff be directed to undertake public engagement on the proposed Zoning By-law regulation options, in conjunction with other housing issues, as part of the development of the new residential zones;~~

(b) That the Residential Care Facilities and Group Homes (Urban Area) – Human Rights and the Zoning By-law Discussion Paper be posted on the City's website and invite written submissions on the proposed Zoning By-law regulation and definition changes for a period of 30 days, with staff reporting back to the Planning Committee on the written submissions received. In the event that additional public engagement is necessary, it would be included with other housing issues as part of the residential zoning project; and,

Result: Amendment CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge

YES – Councillor Terry Whitehead
YES – Councillor Brenda Johnson
NOT PRESENT – Councillor Brad Clark

For disposition of this matter, refer to Item 8.

(j) NOTICES OF MOTION (Item 12)

(i) Effect of Heritage Designations on Property Values in Hamilton (Added Item 12.3)

Councillor Farr introduced the following Notice of Motion respecting Effect of Heritage Designations on Property Values in Hamilton:

That the appropriate staff from PED be requested to consult with the Realtors Association of Hamilton-Burlington in an effort to determine if they are aware of or possess any documented proof (attained through previous reports, studies or sales figures analysis) that a heritage designation decreases a property's value in Hamilton.

(ii) Ways to Better Protect Hamilton Trees on Private Property (Added Item 12.2)

Councillor Farr introduced a Notice of Motion respecting Ways to Better Protect Hamilton Trees on Private Property.

(Farr/Collins)

That the Rules of Order be waived to allow for the introduction of a Motion respecting Ways to Better Protect Hamilton Trees on Private Property.

Result: Motion CARRIED by a 2/3's majority vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
YES – Councillor Jason Farr
YES – Councillor Chad Collins
YES – Councillor John-Paul Danko
YES – Councillor Maria Pearson
YES – Councillor Judi Partridge
YES – Councillor Terry Whitehead
YES – Councillor Brenda Johnson
NOT PRESENT – Councillor Brad Clark

For disposition of this matter, refer to Item 12.

(iii) Zoning By-law Amendment for 1400 Baseline Road (Added Item 12.1)

Councillor Pearson introduced a Notice of Motion respecting Zoning By-law Amendment for 1400 Baseline Road.

(Pearson/Whitehead)

That the Rules of Order be waived to allow for the introduction of a Motion respecting Zoning By-law Amendment for 1400 Baseline Road.

Result: Motion CARRIED by a 2/3's majority vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson
 YES – Councillor Jason Farr
 YES – Councillor Chad Collins
 YES – Councillor John-Paul Danko
 YES – Councillor Maria Pearson
 YES – Councillor Judi Partridge
 YES – Councillor Terry Whitehead
 YES – Councillor Brenda Johnson
 NOT PRESENT – Councillor Brad Clark

For disposition of this matter, refer to Item 13.

(k) GENERAL INFORMATION/OTHER BUSINESS (Item 13)

(i) Outstanding Business List (Item 13.1)

(Whitehead/Partridge)

That the following changes to the Outstanding Business List, be approved:

(a) Items to be Removed:

C - OMB Decision respecting 121 Augusta Street - Staff review of RCF's as it relates to special needs and the Human Rights Code (Addressed as Item 9.1 on this agenda)

G - Feasibility of Tree Services By-law (Addressed as Item 10.2 on this agenda)

(b) Items Requiring New Due Dates:

B - City Initiative to Amend Zoning By-law No. 6593 for 118 - 338 Mountain Brow Blvd.

Current Due Date: July 9, 2019

Proposed New Due Date: July 2020

D - Request to Designate 437 Wilson Street East

Current Due Date: March 19, 2019

Proposed New Due Date: September 17, 2019

H - Report back on engagement between the HMHC and property owners surrounding the Gore

Current Due Date: February 5, 2019

Proposed New Due Date: October 1, 2019

I - Report back on City's Policies respecting Boulevard Standards with options/alternatives for future designs

Current Due Date: March 19, 2019

Proposed New Due Date: September 17, 2019

J - Sign Variance Appeal for 430 McNeilly Road

Current Due Date: March 19, 2019

Proposed New Due Date: September 3, 2019

P - Updated Discharge of Firearms By-law

Current Due Date: February 19, 2019

Proposed New Due Date: May 14, 2019

Q - Update on Animal Adoption Pilot Program

Current Due Date: September 3, 2019

Proposed New Due Date: December 3, 2019

T - Development Fees - additional staffing requirements and potential funding model

Current Due Date: April 2, 2019

Proposed New Due Date: October 15, 2019

U - Review of Hamilton Airshed Modelling System

Current Due Date: March 19, 2019

Proposed New Due Date: November 5, 2019

Z - Update on Effectiveness of Driving School By-law

Current Due Date: August 13, 2019

Proposed New Due Date: February 2020

GG - Staff recommendations after one year Pilot Program for dedicated Mohawk College Parking Enforcement Officer

Current Due Date: October 15, 2019

Proposed New Due Date: December 3, 2019

Result: Motion CARRIED by a vote of 8 to 0, as follows:

YES – Councillor Maureen Wilson

YES – Councillor Jason Farr

YES – Councillor Chad Collins

YES – Councillor John-Paul Danko

YES – Councillor Maria Pearson

YES – Councillor Judi Partridge

YES – Councillor Terry Whitehead

YES – Councillor Brenda Johnson

NOT PRESENT – Councillor Brad Clark

(I) ADJOURNMENT (Item 15)

(Danko/Wilson)

That, there being no further business, the Planning Committee be adjourned at 2:37 p.m.

CARRIED

Respectfully submitted,

Councillor M. Pearson
Chair, Planning Committee

Lisa Chamberlain
Legislative Coordinator
Office of the City Clerk

Chamberlain, Lisa

From: Lakewood Beach Community Council
Sent: April 29, 2019 10:02 AM
To: Chamberlain, Lisa
Cc: Pearson, Maria; Clark, Brad; Whitehead, Terry; Partridge, Judi; JP Danko; Collins, Chad; Farr, Jason; Wilson, Maureen; Johnson, Brenda
Subject: 310 Frances Avenue

Good Morning Lisa, would you please be able to add this to tomorrow agenda as Communications to the Planning Committee?

Dear Madam Chair & Committee Members,

We are seeking your clarification on questions that have been raised by the residents since the meeting of April 16th; substantive and procedural. Some of these queries you might wish to address prior to approving the Minutes of the April 16th meeting.

Substantive:

Can you please advise when Staff will be reporting back to Committee?

We had thought going forward, documents/information/updates would be more public and easily available in order to provide the residents with information and possibly an opportunity for input.

Since the meeting, we asked again for electronic copies of the Studies. We were again told NO, they will not be made available to the public electronically until an Agenda is online for the unknown Tuesday Planning Committee meeting. (the documents are public, but according to Staff the process isn't. Hence, unlike opa/zba planning applications, won't electronically release on a usb stick)

We also asked for minutes and what the outcome was of the April 24th, Development Review Team meeting. We were told the applicant was asked to make revisions, but we have to wait for the details. We can read about the outcome when Staff provide Committee with a 'high level summary' of that meeting and it is on some future agenda.

Can you please clarify the intent of the Motion?

Procedural:

Can you please advise why the Report to Council (and minutes) excluded the addition of the Staff Presentation to the Agenda. The presentation by Staff is showing as a Public Hearing/Delegation rather than a walk on presentation. As well, our slide presentation is not reflected in the reports/minutes. Those exclusions result in no accessible copies on the city's website and we believe, a legal public record that isn't complete.

Can you also please advise why the Motion appeared as a Direction contained in the Information Section of the meeting Report to Council on April 24? Shouldn't Council have been advised a Motion was made, that there was a seconder, it was electronically voted upon, and carried during the April 16th Planning Committee meeting? Those details are indicated in the Minutes, but were not in the Report to Council. Are some Motions ratified at Council and others aren't?

We also believe Clr Partridge provided some directions to Staff that were omitted in the Report - direction to bump up our area in the planning process with a potential report back by the Fall; as well as a report back on other properties zoned RM5 (no height restriction). We're not positive on this, but we had always thought Directions to Staff form part of the public record for addition to the Outstanding Business List to ensure follow through.

We have also always thought Motions and Directions were different so we're confused by the Report/Minutes of the 16th.

It's quite possible we are unnecessarily worried & do not fully grasp the stages of a Site Plan process (or that we misinterpreted Committee's intent). Our understanding is that issues/concerns have already been identified and shared with the applicant as conditions of approval. (ie we read about sewer upgrades in a recent CBC article) It is also rumoured a follow up DRT meeting has been scheduled. We can't help but question if this is even fair to the applicant when Committee (once they receive information) may choose to exercise Council's authority and amend any issues/concerns/conditions/revisions.

Lastly, out of courtesy to the residents who had planned on speaking but were unable to. On behalf of the residents who provided other delegates with parts of their presentations; we would like to ask that rather than the public record reflecting "did not attend", those 2 individuals be afforded the same respectful wording another delegate who also wasn't present received. Specifically, "were unable to attend but ..." Those particular residents made an effort. As a courtesy, we would ask that the record reflect their efforts instead of leaving one to believe they were 'no shows'.

We look forward to any clarifications Committee can provide.

Thank you!

Respectfully,

Lakewood Beach Community Council

Form: Request to Speak to Committee of Council

Submitted on Thursday, May 2, 2019 - 3:36 pm

==Committee Requested==

Committee: Planning Committee

==Requestor Information==

Name of Individual: Mark Clem

Name of Organization:

Contact Number:

Email Address:

Mailing Address:

Reason(s) for delegation request: Present Empirical data on Heritage Registered and Heritage designated residential property in Hamilton

Will you be requesting funds from the City? Yes

Will you be submitting a formal presentation? Yes

Form: Request to Speak to Committee of Council

Submitted on Wednesday, May 8, 2019 - 9:40 am

==Committee Requested==

Committee: Planning Committee

==Requestor Information==

Name of Individual: Viv Saunders

Name of Organization: Lakewood Beach Community Council

Contact Number:

Email Address:

Mailing Address:

Reason(s) for delegation request: Request permission to have community input (contest) on renaming a local Street and Council's direction to waive \$7,000 fee upon filing the Street Renaming form.

Will you be requesting funds from the City? No

Will you be submitting a formal presentation? No

Form: Request to Speak to Committee of Council

Submitted on Thursday, May 9, 2019 - 1:38 pm

==Committee Requested==

Committee: Planning Committee

==Requestor Information==

Name of Individual: Debbie Martin

Name of Organization: Community Group for Stop the Triple Towers at 310 Francis Ave.

Contact Number:

Email Address:

Mailing Address:

Reason(s) for delegation request: Will need to present community input re 3 Towers development project and its affect on my community and Stoney Creek.

Will you be requesting funds from the City? No

Will you be submitting a formal presentation? No

Form: Request to Speak to Committee of Council

Submitted on Thursday, May 9, 2019 - 9:15 pm

==Committee Requested==

Committee: Planning Committee

==Requestor Information==

Name of Individual: Viv Saunders

Name of Organization: Lakewood Beach Community Council

Contact Number:

Email Address:

Mailing Address:

Reason(s) for delegation request: Speak to Item 7.3 - 310
Frances Avenue

Will you be requesting funds from the City? No

Will you be submitting a formal presentation? No

Form: Request to Speak to Committee of Council

Submitted on Friday, May 10, 2019 - 8:55 am

==Committee Requested==

Committee: Planning Committee

==Requestor Information==

Name of Individual: Brian McRae

Name of Organization: Ontario Federation of Anglers and Hunters

Contact Number:

Email Address:

Mailing Address:

Reason(s) for delegation request: To speak to the proposed Discharge of Firearms By-law being presented and discussed.

Will you be requesting funds from the City? No

Will you be submitting a formal presentation? No

Form: Request to Speak to Committee of Council

Submitted on Monday, May 13, 2019 - 11:06 am

==Committee Requested==

Committee: Planning Committee

==Requestor Information==

Name of Individual: Mark Victor

Name of Organization:

Contact Number:

Email Address:

Mailing Address:

Hamilton, ON

Reason(s) for delegation request:

Item 7.3 of May 14th Planning Committee Meeting. Staff Report PED19115 on Site Plan Control Application for 310 Frances Avenue

Will you be requesting funds from the City? No

Will you be submitting a formal presentation? No

Mark P. Victor

May 13, 2019

To: 1. Planning Committee, City of Hamilton
2. Councilor Maria Pearson for Ward 10

From: Mark Victor, CET

Hamilton, ON

Re: ITEM 7.3 of PLANNING COMMITTEE MEETING
Staff Report PED19115 on Site Plan Control Application for 310 Frances Avenue

Via: Email to: clerk@hamilton.ca

Following my presentation to the Planning Committee on April 16, 2019 it was reported that only 7 people were opposed to the proposal to build 3 of the tallest towers in all of Hamilton City at 310 Frances Avenue.

This reported perception of meager opposition is totally inaccurate; in fact, I have received up to this point in time, 95 individual signatures of residents, in The Bayliner condominium building, directly across the street from the 310 Frances Avenue tower site, who are vehemently opposed to the proposed tower development.

For inspection of this petition please contact the writer.

Respectfully submitted,

Mark Victor, CET

Stoney Creek, ON



INFORMATION REPORT

TO:	Chair and Members Planning Committee
COMMITTEE DATE:	May 14, 2019
SUBJECT/REPORT NO:	Active Official Plan Amendment, Zoning By-law Amendment and Plan of Subdivision Applications (PED19078) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Joe Gravina (905) 546-2424 Ext. 1284
SUBMITTED BY:	Steve Robichaud Director of Planning and Chief Planner Planning and Economic Development Department
SIGNATURE:	

Council Direction:

At the June 16, 2015 Planning Committee, staff were “directed to report back to the Planning Committee with a reporting tool that seeks to monitor applications where the 120 or the 180 day statutory timeframe applies”.

This Report provides a status of all active Zoning By-law Amendment, Official Plan Amendment and Plan of Subdivision applications relative to the statutory timeframe provisions of the *Planning Act* for non-decision appeals.

Background:

On April 19, 2016, Information Report (PED16096) was forwarded to the Planning Committee, which provided a status of all active Zoning By-law Amendment, Official Plan Amendment and Plan of Subdivision applications relative to the 120 or the 180 statutory timeframe provisions of the *Planning Act* for non-decision appeals and outlined a process for future reporting to the Planning Committee. The Report included a table outlining the active applications, sorted by Ward, from oldest application to newest. In addition, the Report summarized OMB appeals over the previous five years.

Commencing February 28, 2017, similar Information Reports were forwarded to the Planning Committee on a monthly basis in accordance with the process outlined in Information Report (PED16096). An analysis of the information was also included in the

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SUBJECT: Active Official Plan Amendment, Zoning By-law Amendment and Plan of Subdivision Applications (PED19078) (City Wide) - Page 2 of 3

year-end reports of December 5, 2017 (PED17208), September 18, 2018 (PED18192) and December 11, 2018 (PED18231).

Policy Implications and Legislative Requirements

In accordance with the *Planning Act*, an applicant may appeal an Official Plan Amendment application after 210 days (subsection 17 (40)), Zoning By-law Amendment application after 150 days (subsection 34 (11)) and a Plan of Subdivision after 180 days (subsection 51 (34)).

In accordance with subsection 17(40.1) of the *Planning Act*, the City of Hamilton extends the approval period of Official Plan Amendment applications from 180 days to 270 days for applications received after July 1, 2016 as prescribed in Bill 73 and from 210 to 300 days for applications received after December 12, 2017 as prescribed in Bill 139. It should be noted that either the City or the applicant can terminate the 90-day extension period if written notice to the other party is received prior to the expiration of the 180 day or 210 day statutory timeframes.

In addition, Zoning By-law Amendment applications that are submitted together with a required Official Plan Amendment application are also subject to the statutory timeframe of 210 days.

Information:

Staff were directed to report back to Planning Committee with a reporting tool that seeks to monitor applications where the applicable statutory timeframes apply. This reporting tool would be used to track the status of all active Official Plan Amendment, Zoning By-law Amendment and Plan of Subdivision Applications.

For the purposes of this Report, the status of all active Zoning By-law Amendment, Official Plan Amendment and Plan of Subdivision applications have been divided, relative to the statutory timeframe provisions of the *Planning Act*, prior to December 12, 2017 and after December 12, 2017.

Applications Deemed Complete Prior to Royal Assent (December 12, 2017)

Attached as Appendix “A” to Report PED19078 is a table outlining the active applications received prior to December 12, 2017 sorted by Ward, from oldest application to newest. As of March 8, 2109, there were:

- 16 active Official Plan Amendment applications, all of which were submitted after July 1, 2016, and therefore subject to the 90 day extension to the statutory timeframe from 180 days to 270 days;

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SUBJECT: Active Official Plan Amendment, Zoning By-law Amendment and Plan of Subdivision Applications (PED19078) (City Wide) - Page 3 of 3

- 25 active Zoning By-law Amendment applications; and,
- 10 active Plan of Subdivision applications.

Within 60 to 90 days of May 14, 2019, all 25 development proposals have passed the 120, 180 and 270 day statutory timeframes.

Applications Deemed Complete After Royal Assent (December 12, 2017)

Attached as Appendix “B” to Report PED19078 is a table outlining the active applications received after December 12, 2017 sorted by Ward, from oldest application to newest. As of March 8, 2109, there were:

- 22 active Official Plan Amendment applications, all of which were submitted after December 12, 2017, and therefore subject to the 90 day extension to the statutory timeframe from 210 days to 300 days;
- 42 active Zoning By-law Amendment applications; and,
- 6 active Plan of Subdivision applications.

Within 60 to 90 days of May 14, 2019, 15 applications will be approaching the 150, 180 or the 300 day statutory timeframe and will be eligible for appeal. Twenty-seven applications have passed the 150, 180 and 300 day statutory timeframe.

Combined to reflect property addresses, there are 68 active development proposals. Thirteen proposals are 2019 files, while 29 proposals are 2018 files and 26 proposals are pre-2018 files.

Staff are currently working with the AMANDA Implementation Team to add enhancements that will allow for the creation of more detailed reporting. As a result, future tables will include a qualitative analysis of the status of active applications. It is anticipated that these enhancements will be available in Q3 of 2019 and this information will be incorporated into the monthly report to Council. Furthermore, the long-term goal of the Planning Division is to make this information available on an interactive map accessed through the City of Hamilton website.

Appendices and Schedules Attached:

Appendix “A” – List of Active Development Applications (prior to December 12, 2017)
Appendix “B” – List of Active Development Applications (after December 12, 2017)

JG:mo

**Active Development Applications
Deemed Complete Prior to December 12, 2017
(Effective March 8, 2019)**

File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	120 day cut off (Rezoning)	180 day cut off (Plan of Sub)	270 day cut off OPA*	Applicant/ Agent	Days Since Received and/or Deemed Complete as of May 14, 2019
Ward 1									
UHOPA-17-18 ZAC-17-036	644 Main St. W., Hamilton	31-Mar-17	n/a	28-Apr-17	29-Jul-17	n/a	26-Dec-17	Urban Solutions Planning & Land Development	774
Ward 2									
ZAC-17-008	117 Forest Ave. & 175 Catharine St. S., Hamilton	23-Dec-16	n/a	05-Jan-17	22-Apr-17	n/a	n/a	Urban Solutions Planning & Land Development	872
UHOPA-17-33 ZAC-17-073	125 - 129 Robert St., Hamilton	06-Oct-17	30-Oct-17	14-Nov-17	03-Feb-18	n/a	11-Aug-18	IBI Group	546
Ward 7									
UHOPA-17-31 ZAC-17-071	1625 - 1655 Upper James St., Hamilton	27-Sep-17	n/a	02-Oct-17	25-Jan-18	n/a	24-Jun-18	MB1 Development Consulting Inc.	594
ZAC-17-089	1351 Upper James St., Hamilton	28-Nov-17	n/a	05-Dec-17	28-Mar-18	n/a	n/a	Patrick Slattery	532

**Active Development Applications
Deemed Complete Prior to December 12, 2017
(Effective March 8, 2019)**

File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	120 day cut off (Rezoning)	180 day cut off (Plan of Sub)	270 day cut off OPA*	Applicant/ Agent	Days Since Received and/or Deemed Complete as of May 14, 2019
Ward 9									
UHOPA-16-26 ZAC-16-065 25T-201611	478 & 490 First Rd. W., Stoney Creek	12-Oct-16	n/a	02-Nov-16	09-Feb-17	10-Apr-17	09-Jul-17	T. Johns Consultants Inc.	944
UHOPA-16-27 ZAC-16-066 25T-201612	464 First Rd. W., Stoney Creek	12-Oct-16	n/a	02-Nov-16	09-Feb-17	10-Apr-17	09-Jul-17	T. Johns Consultants Inc.	944
UHOPA-16-25 ZAC-16-064 25T-201609	1809, 1817, & 1821 Rymal Rd. E., Stoney Creek	07-Oct-16	n/a	23-Nov-16	04-Feb-17	05-Apr-17	04-Jul-17	WEBB Planning Consultants Inc.	949
UHOPA-17-01 ZAC-17-001 25T-201701	15 Ridgeview Dr., Stoney Creek	02-Dec-16	n/a	16-Dec-16	01-Apr-17	31-May-17	29-Aug-17	A.J. Clarke & Associates Ltd.	893
UHOPA-16-21 ZAC-16-057 25T-201608	56 Highland Rd. W., Stoney Creek	31-Aug-16	29-Sep-16	27-Mar-17	29-Dec-16	27-Feb-17	22-Dec-17	Metropolitan Consulting Inc.	778

**Active Development Applications
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(Effective March 8, 2019)**

File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	120 day cut off (Rezoning)	180 day cut off (Plan of Sub)	270 day cut off OPA*	Applicant/ Agent	Days Since Received and/or Deemed Complete as of May 14, 2019
Ward 10									
ZAC-15-040	9 Glencrest Ave., Stoney Creek	02-Jul-15	n/a	10-Aug-15	30-Oct-15	n/a	n/a	WEBB Planning Consultants Inc.	1412
UHOPA-17-36 ZAC-17-079	514 Barton St., Stoney Creek	27-Oct-17	n/a	23-Nov-17	24-Feb-18	n/a	24-Jul-18	GSP Group	564
ZAC-16-016	1313 Baseline Rd., Stoney Creek	15-Jan-16	n/a	15-Feb-16	14-May-16	n/a	n/a	A.J. Clarke & Associates Ltd.	1215
UHOPA-17-05 ZAC-17-015 25T-201703	1, 19, 20, 21, 23, 27 & 30 Lakeside Dr. & 81 Waterford Cres., Stoney Creek	23-Dec-16	n/a	17-Jan-17	22-Apr-17	21-Jun-17	19-Sep-17	IBI Group	872
ZAC-17-076 25T-201711	1216, 1218 and 1226 Barton St. E. and 1219 Hwy. 8, Stoney Creek	30-Oct-17	n/a	24-Nov-17	27-Feb-18	28-Apr-18	n/a	Glen Schnarr & Associates Inc.	561

**Active Development Applications
Deemed Complete Prior to December 12, 2017
(Effective March 8, 2019)**

File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	120 day cut off (Rezoning)	180 day cut off (Plan of Sub)	270 day cut off OPA*	Applicant/ Agent	Days Since Received and/or Deemed Complete as of May 14, 2019
Ward 11									
UHOPA-17-12 ZAC-17-027 25T-210706	2341 & 2365 Regional Rd. 56 & Tanglewood Dr., Glanbrook	23-Feb- 17	n/a	06-Mar- 17	23-Jun-17	02-Sep-17	20-Nov- 17	A.J. Clarke & Associates Ltd.	810
Ward 12									
ZAC-16-006 25T-201602	285, 293 Fiddlers Green Rd., Ancaster	23-Dec- 15	n/a	06-Jan-16	21-Apr-16	20-Jun-16	n/a	Liam Doherty	1238
ZAC-17-062	45 Secinaro Ave., Ancaster	28-Jul- 17	n/a	01-Aug- 17	25-Nov- 17	n/a	n/a	T. Johns Consultants Inc.	655
UHOPA-17-25 ZAC-17-058	305 Garner Rd. W., Ancaster	11-Jul- 17	17-Jul-17	08-Aug- 17	08-Nov- 17	n/a	05-May- 18	MHBC Planning Limited	644
UHOPA-17-22 ZAC-17-051	280 Wilson St. E., Ancaster	05-Jun- 17	22-Jun-17	23-Aug- 17	03-Oct-17	n/a	20-May- 18	GSP Group	629
UHOPA-17-32 ZAC-17-072	35 Londonderry Dr., Ancaster	06-Oct- 17	n/a	01-Nov- 17	03-Feb-18	n/a	03-Jul-18	A.J. Clarke & Associates Ltd.	585

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(Effective March 8, 2019)**

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Ward 13									
ZAR-15-004	64 Hatt St., Dundas	02-Dec-14	n/a	02-Jan-15	01-Apr-15	n/a	n/a	336477 Ontario Ltd.	1624
ZAC-17-064 25T-201710	655 Cramer Rd., Flamborough	09-Aug-17	n/a	17-Aug-17	07-Dec-17	05-Feb-18	n/a	A.J. Clarke & Associates Ltd.	643
Ward 15									
UHOPA-17-06 ZAC-17-016	157 Parkside Dr., Flamborough	23-Dec-16	n/a	17-Jan-17	22-Apr-17	n/a	19-Sep-17	MHBC Planning Limited	872
RHOPA-17-38 ZAC-17-081	1633 Highway 6, Flamborough	08-Nov-17	n/a	21-Nov-17	08-Mar-18	n/a	05-Aug-18	1685486 ONTARIO INC.	552

Active Development Applications

- When an application is deemed incomplete, the new deemed complete date is the day the new materials are submitted. In these situations, the 120, 180 & 270 day timeframe commences on the date the new materials were submitted. In all other situations, the 120, 180 & 270 day timeframe commences the day the application was received.
- * In accordance with Section 17 (40.1) of the *Planning Act*, the City of Hamilton has extended the approval period of Official Plan Amendment applications by 90 days from 180 days to 270 days. However, applicants can terminate the 90 day extension if written notice to the Municipality is received prior to the expiration of the 180 statutory timeframe.

**Active Development Applications
Deemed Complete After December 12, 2017
(Effective March 8, 2019)**

File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	150 day cut off (Rezoning)	180 day cut off (Plan of Sub.)	300 day cut off (OPA)	Applicant/ Agent	Days since Received and/or Deemed Complete as of May 14, 2019
Ward 1									
UHOPA-18-005* ZAC-18-012	235 Main St. W., Hamilton	22-Dec-17	n/a	19-Jan-18	n/a	n/a	18-Oct-18*	Urban Solutions Planning & Land Development	508
UHOPA-18-015* ZAC-18-035	69 Sanders Blvd. & 1630 Main St. W., Hamilton	18-Jun-18	n/a	13-Jul-18	n/a	n/a	14-Apr-19*	Urban Solutions Planning & Land Development	330
UHOPA-19-004* ZAC-19-009	804-816 King St. W., Hamilton	21-Dec-19	n/a	18-Jan-19	n/a	n/a	17-Oct-19*	Urban Solutions Planning & Land Development	144
Ward 2									
UHOPA-17-041* ZAC-17-090	80 and 92 Barton St. E and 215 and 245 Catharine St. N., Hamilton	29-Nov-17	n/a	14-Dec-17	n/a	n/a	25-Sep-18*	IBI Group	531

**Active Development Applications
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Ward 2 cont'd									
UHOPA-18-004* ZAC-18-009	299 - 307 John St. S., Hamilton	22-Dec-17	n/a	19-Jan-18	n/a	n/a	18-Oct-18*	Urban Solutions Planning & Land Development	508
ZAC-18-013	122 & 126 Augusta St. & 125 & 127 Young St., Hamilton	21-Dec-17	n/a	25-Jan-18	20-May-18	n/a	n/a	Urban Solutions Planning & Land Development	509
UHOPA-18-007* ZAC-18-020	468, 470, 474 and 476 James St. N., Hamilton	09-Mar-18	n/a	27-Mar-18	n/a	n/a	03-Jan-19*	SvN Architects + Planners	431
UHOPA-18-008* ZAC-18-024	600 James St. N., Hamilton	29-Mar-18	n/a	23-Apr-18	n/a	n/a	23-Jan-19*	Bousfields Inc.	411
UHOPA-18-015* ZAC-18-037	282 MacNab St. N., Hamilton	06-Jul-18	n/a	25-Sep-18	n/a	n/a	02-May-19*	GSP Group	312

**Active Development Applications
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Ward 2 cont'd									
UHOPA-18-017* ZAC-18-041	225 John St. S., Hamilton	13-Jul-18	n/a	16-Aug-18	n/a	n/a	09-May-19*	GSP Group	305
UHOPA-18-021* ZAC-18-047	184 and 186 Markland St., Hamilton	22-Aug-18	20-Dec-18	21-Dec-18	n/a	n/a	17-Oct-19*	T. Johns Consulting Group	144
UHOPA-18-023* ZAR-18-057	130 Wellington St. S., Hamilton	07-Nov-18	06-Dec-18	24-Dec-18	n/a	n/a	20-Oct-19*	MBI Development Consulting INC.	141
ZAR-19-008	124 Walnut St. S., Hamilton	21-Dec-18	n/a	18-Jan-19	20-May- 19	n/a	n/a	IBI Group	144
Ward 3									
ZAC-19-014	116 Barnesdale Ave. N., Hamilton	31-Jan-19	n/a	20Feb-19	30-Jun-19	n/a	n/a	IBI Group	103

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(Effective March 8, 2019)**

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Ward 5									
UHOPA-19-001* ZAC-19-001	2782 Barton St. E., Hamilton	30-Nov-18	n/a	13-Dec-18	n/a	n/a	26-Sep-19*	A.J. Clarke & Associates Ltd.	165
Ward 6									
ZAC-19-004	560 Highland Rd. W., Hamilton	10-Dec-18	n/a	18-Jan-19	09-May-19	n/a	n/a	WEBB Planning Consultants Inc.	155
Ward 7									
ZAC-18-008	370 Concession St., Hamilton	21-Dec-17	n/a	22-Jan-18	20-May-18	n/a	n/a	Urban Solutions Planning & Land Development	509
25T-19002	70 Bobolink Rd., Hamilton	3-Jan-19	n/a	18-Jan-19	n/a	02-Jul-19	n/a	IBI Group	131
Ward 8									
ZAC-18-022	35 Sabrina Blvd., Hamilton	15-Mar-18	n/a	09-Apr-18	12-Aug-18	n/a	n/a	Urban Solutions Planning & Land Development	425

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Ward 8 cont'd									
UHOPA-18-010* ZAC-18-025 25T-201803	221 Genoa Dr. and 1477 Upper James St., Hamilton	12-Apr-18	n/a	10-May-18	09-Sep-18	09-Oct-18	06-Feb-19*	MHBC Planning Limited	397
ZAC-18-046	360 Mohawk Rd. W., Hamilton	30-Aug-18	n/a	14-Sep-18	27-Jan-19	n/a	n/a	IBI Group	257
ZAC-18-055	808 West 5 th St., Hamilton	31-Oct-18	n/a	08-Nov-18	30-Mar-19	n/a	n/a	A.J. Clarke & Associates Ltd.	195
Ward 9									
UHOPA-18-011* ZAC-18-029	1912 Rymal Rd. E., Glanbrook	04-May-18	n/a	22-May-18	n/a	n/a	28-Feb-19*	Wellings Planning Consultants Inc.	375
Ward 10									
ZAC-18-005	42, 44, 48, 52 and 54 Lakeshore Dr., Stoney Creek	15-Dec-17	n/a	16-Jan-18	14-May-18	n/a	n/a	A.J. Clarke & Associates Ltd.	515
UHOPA-18-013* ZAC-18-034	461 Green Road, Stoney Creek	8-Jun-18	n/a	18-Jul-18	n/a	n/a	04-Apr-19*	IBI Group	340

**Active Development Applications
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Ward 10 cont'd									
ZAC-18-049	860 and 884 Barton St., Stoney Creek	01-Oct-18	n/a	11-Oct-18	28-Feb-19	n/a	n/a	MHBC Planning Limited	225
UHOPA-18-025 ZAC-18-059	466-490 Highway No. 8, Stoney Creek	23-Nov-18	n/a	06-Dec-18	n/a	n/a	19-Sep-19	SvN Architects + Planners	172
UHOPA-19-003* ZAC-19-007 25T-2019001	238 Barton St., Stoney Creek	19-Dec-18	n/a	02-Jan-19	n/a	17-Jun-19	15-Oct-19*	A.J. Clarke & Associates Ltd.	146
Ward 11									
ZAA-18-006	3600 Guyatt Rd., Glanbrook	20-Dec-17	18-Jan-18	24-Jan-18	23-Jun-18	n/a	n/a	Larry Freeman	475
UHOPA-18-016* ZAC-18-040 25T-2018007	9511 Twenty Rd. W., Glanbrook	10-Jul-18	n/a	15-Aug-18	n/a	06-Jan-19	06-May-19*	Corbett Land Strategies	308
ZAA-18-053	2282 Westbrook Rd., Glanbrook	23-Oct-18	n/a	14-Nov-18	22-Mar-19	n/a	n/a	IBI Group	203

**Active Development Applications
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File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	150 day cut off (Rezoning)	180 day cut off (Plan of Sub.)	300 day cut off (OPA)	Applicant/ Agent	Days since Received and/or Deemed Complete as of May 14, 2019
Ward 12									
ZAC-18-048 25T-2018009	387, 397, 405 and 409 Hamilton Dr., Ancaster	09-Sep-18	n/a	28-Sep-18	06-Feb-19	08-Mar-19	n/a	Fothergill Planning & Development Inc.	247
ZAA-18-052	1557 2 nd Concession Rd. W., Flamborough	16-Oct-18	n/a	22-Oct-18	15-Mar-19	n/a	n/a	Chris Van Berkel	210
UHOPA-18-022* ZAC-18-056 25T-2018010	26 Southcote Rd., Ancaster	05-Nov-18	n/a	15-Nov-18	n/a	04-May- 19	01-Sep-19*	A.J. Clarke & Associates Ltd.	190
UHOPA-18-024* ZAC-18-058	154 Wilson St. E., Ancaster	28-Nov-18	n/a	10-Dec-18	n/a	n/a	24-Sep-19*	Urban Solutions Planning & Land Development	167
UHOPA-19-002* ZAC-19-002	1173 and 1203 Old Golf Links Rd., Ancaster	03-Dec-18	n/a	01-Dec-18	n/a	n/a	29-Sep-19*	A.J. Clarke & Associates Ltd.	162

**Active Development Applications
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File	Address	Date Received	Date ¹ Deemed Incomplete	Date ¹ Deemed Complete	150 day cut off (Rezoning)	180 day cut off (Plan of Sub.)	300 day cut off (OPA)	Applicant/ Agent	Days since Received and/or Deemed Complete as of May 14, 2019
Ward 12 cont'd									
ZAC-19-010	527 and 629 Shaver Rd., Ancaster	21Dec-18	n/a	10-Jan-19	20-May19	n/a	n/a	Urban Solutions Planning & Land Development	144
Ward 13									
ZAR-19-013	574 NorthCliffe Ave., Dundas	31-Jan-19	n/a	21-Feb-19	30-Jun-19	n/a	n/a	IBI Group	103
Ward 14									
ZAR-19-003	630 Stone Church Rd. W., Hamilton	07-Dec-18	n/a	07-Jan-19	06-May-19	n/a	n/a	IBI Group	158
ZAR-19-006	1269 Mohawk Rd., Ancaster	14-Dec-18	n/a	11-Jan-19	13-May-19	n/a	n/a	MBI Development Consulting INC.	151
ZAC-19-011	1933 Old Mohawk Rd., Ancaster	12-Dec-18	n/a	10-Jan-19	11-May-19	n/a	n/a	Urban Solutions Planning & Land Development	153

**Active Development Applications
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Ward 15									
ZAR-18-019	167 Highway 5 West, Flamborough	23-Feb-18	n/a	22-Mar-18	23-Jul-18	n/a	n/a	IBI Group	445
RHOPA-18-020* ZAC-18-045	173 & 177 Dundas St. E., Flamborough	23-Jul-18	n/a	15-Aug-18	n/a	n/a	19-May-19*	MHBC Planning Limited	295

Active Development Applications

1. When an application is deemed incomplete, the new deemed complete date is the day the new materials are submitted. In these situations, the 150, 180, 210 & 300 day timeframe commences on the date the new materials were submitted. In all other situations, the 150, 180, 210 & 300 day timeframe commences the day the application was received.
2. In accordance with Section 34 (11.0.0.0.1), of the *Planning Act*, the approval period for Zoning By-law Amendment applications submitted concurrently with an Official Plan Amendments, will be extended to 210 days.
3. In accordance with Section 17 (40.1) of the *Planning Act*, the City of Hamilton has extended the approval period of Official Plan Amendment applications by 90 days from 210 days to 300 days. However, applicants can terminate the 90 day extension if written notice to the Municipality is received prior to the expiration of the 210 statutory timeframe.



INFORMATION REPORT

TO:	Chair and Members Planning Committee
COMMITTEE DATE:	May 14, 2019
SUBJECT/REPORT NO:	Micro-Mobility - E-Scooters (PED19099) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Ken Leendertse (905) 546-2424 Ext. 3059 Peter Topalovic (905) 546-2424 Ext. 5129
SUBMITTED BY:	Ken Leendertse Director, Licensing and By-law Services Planning and Economic Development Department
SIGNATURE:	
SUBMITTED BY:	Brian Hollingworth Director, Transportation Planning and Parking Planning and Economic Development Department
SIGNATURE:	

INFORMATION

In the past few years, there has been an emergence of several new technologies aimed at providing options for first mile and last mile connections and short trips. These include bike share (e.g. Sobi), small one or two-person electric cars, and the newest trend – e-scooters.

Commonly referred to as “micro-mobility”, these new technologies will increase mobility choices for the citizens of Hamilton. However, there is also a risk that they could be perceived as a nuisance, and potentially create public safety concerns if not properly regulated. This report provides an overview of micro-mobility trends that may have an impact within the City of Hamilton. The primary focus is on e-scooters as they may pose the most concern for municipalities in terms of safety and required changes to by-laws and traffic regulations.

E-scooters represent a new way for residents to move around their communities. E-scooters are electronic powered, two-wheel standing vehicles designed for a single rider. These e-scooters are parked using a kickstand and usually have lights, sensors

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and personal identification that activates the e-scooter by using an app on a smart phone.

Given their convenience for short trips, they have the potential to increase access to transit stops, replace short car trips in busy retail areas, and generally reduce dependence on single occupant vehicles. Because they are powered by batteries, they also have the potential to reduce greenhouse gas emissions and noise impacts, as compared to regular gasoline vehicles. A detailed overview of e-scooters was recently prepared by the Share the Road Cycling Coalition and is attached as Appendix “A” to this Report. The overview summarizes the opportunities, challenges and current state of legislation and policy related to e-scooters.

The prevalence of e-scooters has increased dramatically over the past two years. E-scooter companies, such as Lime and Bird, have placed e-scooters in over 100 cities worldwide. E-scooters are currently in operation in several major cities in the United States (US) as well as several European Countries. Within Ontario, the City of Waterloo is piloting e-scooters along the Laurel Trail and currently examining expanding the pilot to include the University of Waterloo in 2019.

Most e-scooters providers are operating with the approval and cooperation of the municipality; however, there are examples of companies launching start-ups in municipalities without approval. Companies who do not work with the municipality tend to opt for the model of ‘disrupt first and apologize later’. In these situations, e-scooters are often set up overnight with no regulations or by-laws in place. Several cities have now either banned or impounded these e-scooters. One of the main reasons that e-scooters are being impounded is because they are left in unsafe locations, blocking sidewalks or wheelchair accessible ramps, laying on the sidewalk or leaning against fire hydrants. Conversely, larger more established companies do not employ this strategy and work closely with municipalities to ensure mutual benefit.

With respect to safety, e-scooters have raised concerns as most do not come with helmets or require special training for operation. Several people have been seriously injured while driving e-scooters with at least three fatalities being reported in the US. A law suit was filed in California after several people were injured from tripping over e-scooters discarded on sidewalks or because the e-scooter operators have run into pedestrians from behind.

In Ontario, operating e-scooters on sidewalks or roadways is currently against the law. They can only be operated on private property if permitted by owners. However, given their inevitable introduction, new policies and regulations will be required at both the provincial and municipal level. The Ministry of Transportation (MTO) is currently in consultation with the e-scooter providers to examine if this new mode of transportation will be allowed on roadways and what restrictions, if any, will be considered.

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One potential impact on municipalities may be an increased need to enforce e-scooter operators who are breaking the rules. For example, regulations may be required to ensure riders do not park e-scooters such that they block access to sidewalks, entrances or impede the safety of others.

Several US cities have implemented by-laws that give Municipal Law Enforcement Officers the ability to retrieve and impound the e-scooters from around the city. Some cities have licensed the e-scooter businesses, while others have created permits for each e-scooter so they can be parked on sidewalks. Where an established policy regime exists, and there is a strong partnership between the municipality and the e-scooter operator, there is a higher potential to achieve greater compliance of rules to ensure the pedestrian zone of the right of way is not impeded by improperly parked e-scooters.

As part of preparing for e-scooters in the City of Hamilton, staff met with the operator of Lime. Lime reported that many of the initial concerns about nuisances have not materialized in other cities where they have launched services. Many of the concerns identified previously have been effectively dealt with by the business model and technology. Strategies used by Lime, and other major operators, include:

- Re-balancing of the e-scooter fleet;
- Geo-fencing to restrict parking outside of suitable areas;
- Education for riders;
- End of trip policies to ensure e-scooters are parked correctly;
- An alert system and mobile response if the e-scooter is not left upright; and,
- Creation of a Local Operational Team that responds to any concerns.

As evidence that e-scooter behaviour can be managed, data from Lime shows that 72% of all e-scooters were parked correctly on sidewalks with most of the others (23%) parked off the streetscape on adjacent properties. Of the e-scooters parked on sidewalks, 90% did not disrupt pedestrian flow. Virtually all e-scooters were parked upright. Lime also encourages riders to wear helmets, have riders pledge to adhere to safe and responsible riding and have on-the-ground safety ambassadors dedicated to educating local communities about e-scooter safety.

Reputable e-scooter companies are willing to work with a municipality to ensure the e-scooters are placed in the most appropriate locations to ensure access, but not impact sidewalks or pedestrian flow.

Although there are still several regulatory changes that are required at the provincial level before e-scooters can be fully deployed, it is prudent that the City of Hamilton start to prepare for their introduction. While monitoring pending changes to the Highway Traffic Act (HTA), staff will continue to evaluate options to ensure some municipal control over these new modes, either through licensing or by contracting out to an

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appropriate operator with specific guidelines. The latter approach would be similar to what was done with SoBi Hamilton for the introduction of bike share.

Staff will continue to report back to Council with respect to any potential introductions of e-scooters in Hamilton, as well as options for appropriately regulating and integrating them into the City as part of our multi-modal transportation system.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” - Draft Briefing Notes: E-Scooters in Ontario

KL:BH:st

DRAFT BRIEFING NOTE: E-SCOOTERS IN ONTARIO

Prepared by: Share the Road Cycling Coalition

THE OPPORTUNITY

E-scooters represent a new way for residents to get around their communities. They have been lauded as providing first and last mile connections to transit, particularly in areas where the trip is too long to walk. If residents choose to replace car trips with e-scooters, they also represent an opportunity to reduce traffic congestion. Preliminary evidence from the e-scooter pilot in Portland, Oregon suggests that e-scooter riders are using them to replace car trips (34%) and that the e-scooters are popular among residents, with 85% of those surveyed indicating that they would recommend e-scooters to a friend ⁽¹⁾.

THE CHALLENGE

E-scooters are a relatively new technology and mode of transportation. As a result, there are few studies about their safety, market resilience and ability to operate through the winter. While the Portland pilot results indicate that people are using e-scooters for trips that otherwise may have been made by car, it is important to note that Portland is recognized as a Platinum Bicycle Friendly Community and has invested more than most in providing safe & convenient space for people to cycle. This bicycle infrastructure is also now being used by people riding e-scooters, and is preferred among riders who were surveyed ⁽¹⁾. Most communities do not have the same infrastructure available for bicycling or for e-scooter riders as Portland does and the availability of safe spaces to ride should be a key concern.



Sample photo of an e-scooter

Medical professionals have raised concerns about increased emergency room visits due to the proliferation of e-scooters, with many sources pointing to one Salt Lake City hospital that reported a 161% increase ⁽²⁾ in emergency room visits related to e-scooters (from 8 patients to 21) ⁽³⁾. Another recent study of medical records from two UCLA hospitals in Los Angeles and Santa Monica indicate that e-scooters have been associated with 249 emergency room visits between September 2017 and August 2018 ⁽⁴⁾. As of September 2018, the death rate among e-scooter riders across the United States was reported to be 1 per 10.75 million trips, compared to 1 per 61.5 million trips for bike share ⁽⁵⁾. In December 2018, the Centre for Disease Control announced ⁽⁶⁾ that it would be conducting its first study of the health risks of dockless scooters in Austin, Texas.

There have also been collisions between e-scooter riders and pedestrians on the sidewalk and concerns about sidewalks being obstructed by poorly parked e-scooters, and the serious impact this has on the mobility of elderly and visually impaired residents and residents using mobility devices.

E-SCOOTERS AND ONTARIO LAW

At present, e-scooters can only be operated where the Ontario Highway Traffic Act (HTA) does not apply, such as on private property if permitted by the owners. This is the case during the ongoing pilot conducted by Lime in Waterloo, ON, where the scooters are permitted only on private trails and university campus ⁽⁷⁾.

LEARNING FROM OTHER JURISDICTIONS

While there is no clear-cut guidance for this new technology, several jurisdictions have enacted policies to govern the use of e-scooters:

- Regulations currently being considered in Washington, DC would require companies to provide a toll-free phone number for people to report badly parked vehicles. They also require companies to provide a \$10,000 security deposit, which the city can keep if companies fail to remove badly parked e-scooters⁽⁸⁾.
- While some jurisdictions (ex. Denver) allow the use of e-scooters on the sidewalks, many jurisdictions have banned e-scooters from the sidewalks and require riders to use the road and bicycle lanes.
- Most e-scooters in the United States appear to be capped at a maximum speed of 15 mph (24 km/h). A 2018 effort in California – reportedly led by e-scooter company Bird – aimed to increase the maximum speed to 20 mph (32 km/h) and allow sidewalk riding, but failed to pass⁽⁹⁾.
- California recently passed legislation allowing people 18 years of age and older to operate e-scooters without a helmet. This same legislation stipulates that e-scooter riders cannot carry passengers or any packages that prevent them from keeping at least one hand on the handlebars. California also prohibits riders from leaving e-scooters lying on their side on any sidewalk, or from parking e-scooters on sidewalks in a manner that does not provide an adequate path for pedestrian traffic⁽¹⁰⁾.
- Some jurisdictions like Miami and Nashville have banned the use of e-scooters all together, while others like San Francisco require prospective companies to apply for a limited number of operating permits⁽¹¹⁾. Some municipalities have set geographic limits on where e-scooters can be operated (ex. Santa Monica has banned them along the beach path⁽¹²⁾ and Portland has banned them in Waterfront Park⁽¹¹⁾).
- In Santa Monica, city council recently approved a “use of public space fee” for the use of public property for private commercial purposes. The recommended fee is \$0.98/scooter per day⁽¹²⁾.
- As part of their pilot project, Santa Monica is also repurposing street space to create shared mobility device zones to help prevent sidewalk blockage by e-scooters. Over 60 zones have been installed in the first few months⁽¹³⁾.
- In Washington, DC, e-scooter systems must offer cash payment options and the ability to unlock scooters without a smart phone to ensure that residents can access the e-scooters without a smartphone or bank account⁽¹⁴⁾.
- To ensure that these services are available to residents and communities that could benefit most, Portland, Oregon requires that e-scooter operators deploy a minimum of 100 e-scooters of 20% or their fleet (whichever is less) each day in the historically underserved East neighbourhoods⁽¹⁴⁾.
- Currently, the City of Waterloo is undertaking an e-scooter pilot project. The pilot is two phases, with a maximum of 100 e-scooters in Fall 2018 and a maximum of 150 e-scooters in spring 2019. The maximum speed of e-scooters during the pilot is 24 km/h. The pilot specifies the specific “pilot routes” on which the e-scooters can be operated. It also specifies hours of operation for e-scooters between 7am to 9pm. The operator (Lime) is responsible for removing all e-scooters from operation after 9pm and for collecting all e-scooters on public and private property (except those in designated recharge havens). E-scooter riders must be 18 years of age and upload a driver's license as proof of age⁽⁷⁾. Riders are not required to wear a helmet.

E-scooter companies themselves also have campaigns and technology aimed at enhancing the e-scooter experience. This includes requiring users to take photos of their parked e-scooters to encourage good parking behaviour, and allowing users to report poorly parked e-scooters through the app. To keep sidewalks clear, Bird has committed to re-organizing and re-balancing their systems at the end of every day ⁽¹⁵⁾.

Companies require users to participate in an online safety tutorial the first time they use the app and many distribute free helmets to users who request them. Bird requires users to upload a driver's license as proof of being at least 18 years old. In San Francisco, Skip has established a community advisory council to oversee operations. Lime has indicated that they have the ability to provide incentives as well as fines to users through their app if required by local government ⁽¹⁶⁾. In terms of ensuring that e-scooter users have safe spaces to ride, in some cities Bird provides \$1 per scooter per day to municipalities to help build protected cycling infrastructure ⁽¹⁷⁾.

DRAFT POLICY RECOMMENDATIONS FOR ONTARIO

Introducing a new mode of transportation is not a decision that should be made lightly, which is why we would like to see e-scooters permitted in Ontario as part of a **2-year pilot program**. Many municipalities in the US have adopted e-scooters under a pilot framework as it allows for a better understanding of the opportunities and challenges presented by e-scooters. Ontario should do the same.

Share the Road recommends that the Province of Ontario permit the riding of e-scooters on roads and in bicycle lanes, but not on sidewalks. Like e-bicycles, we recommend that e-scooters be permitted anywhere that conventional bicycles can operate, unless restricted by a municipal by-law.

In order to ensure the safety of all road users during this pilot project, we recommend that the Province:

- Require that all first time users participate in an online training tutorial via the operators app, developed by the operator and approved by the province and respective local municipality;
- Require that all e-scooter riders in the pilot be at least 18 years of age;
- Require that e-scooter companies provide a toll free number for residents to report poor parking of e-scooters, in addition to any in-app reporting that can be done by users;
- Limit the speed of e-scooters to 24 km/h and require an emergency power shut off switch;
- Require e-scooters to adhere to the same requirements as bicycles with regards to front and rear lights and a bell;
- Specify that e-scooter riders are prohibited from carrying passengers;
- Prohibit e-scooter riders from carrying any packages that prevent them from keeping two hands on the handlebars;
- Specifically prohibit e-scooter riders from leaving e-scooters lying on their sides or parked in a way that does not allow adequate space for pedestrian traffic;
- Allow municipalities the option of charging a "use of public space fee" to e-scooter companies;
- Allow municipalities to set geographic limits in which e-scooters can/cannot operate, and;
- Allocate a portion of the province's transportation funding to build safe and separate spaces for both bicycles and e-scooters in municipalities.

REFERENCES

- (1) <https://www.portlandoregon.gov/transportation/article/700916>
- (2) https://www.washingtonpost.com/technology/2018/09/24/hospital-er-reports-percent-spike-visits-involving-e-scooters/?noredirect=on&utm_term=.922f48865766
- (3) <https://www.sltrib.com/news/2018/09/24/salt-lake-city-er-reports/>
- (4) <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2722574?questAccessKey=c8d43986-1131-4af7-b3bc-a9f9415cd3b3>
- (5) <https://usa.streetsblog.org/2018/09/24/e-scooter-deaths-underscore-the-urgent-need-for-safer-streets/>
- (6) <https://www.texasmonthly.com/article/cdc-study-electric-scooters-austin/>
- (7) <https://events.waterloo.ca/meetings/Detail/2018-10-01-0000-Council-Meeting/e7b8d13f-e0c2-4928-b7ad-a9b200f33a01>
- (8) https://nextcity.org/daily/entry/washington-dc-issues-dockless-regs-to-tame-burgeoning-industry?utm_source=Next+City+Newsletter&utm_campaign=619ba1dd1d-Daily_781_COPY_01&utm_medium=email&utm_term=0_fcee5bf7a0-619ba1dd1d-43991409
- (9) <https://cal.streetsblog.org/2018/07/03/ca-bill-no-longer-redefines-e-scooters-but-removes-helmet-requirements-for-over-18/>
- (10) https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB2989
- (11) <https://nacto.org/wp-content/uploads/2018/07/NACTO-Shared-Active-Transportation-Guidelines.pdf>
- (12) <https://smmirror.com/2018/08/city-council-approves-scooter-fee-beach-bike-path-citations-coming/>
- (13) <https://playbook.t4america.org/parking-street-design/>
- (14) <https://playbook.t4america.org/equity/>
- (15) <https://www.citylab.com/transportation/2018/04/the-micromobility-wars-are-upon-us/558173/>
- (16) <https://www.thestar.com/business/technology/2018/10/02/lime-electric-scooters-roll-out-in-canada.html>
- (17) <https://ny.curbed.com/2018/10/15/17969900/new-york-electric-scooters-bird-legislation-street-design>



CITY OF HAMILTON
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Planning Division

TO:	Chair and Members Planning Committee
COMMITTEE DATE:	May 14, 2019
SUBJECT/REPORT NO:	Site Plan Control Application for 310 Frances Avenue (PED19115) (Ward 10)
WARD(S) AFFECTED:	Ward 10
PREPARED BY:	Melanie Schneider (905) 546-2424 Ext. 1224
SUBMITTED BY:	Steve Robichaud Director, Planning and Chief Planner Planning and Economic Development Department
SIGNATURE:	

RECOMMENDATION

- (a) That Report PED19115 (Site Plan Control Application DA-19-020 for lands located at 310 Frances Avenue) be received;
- (b) That Site Plan Control Application DA-19-020 for the proposed development of three tall buildings having heights of 48, 54, and 59 storeys and a total of 1,836 residential units be referred back to the Applicant for revisions to the proposal on the following basis:
- i) The proposal does not implement the policies of the Urban Hamilton Official Plan related to Urban Design;
 - ii) Insufficient information has been provided to determine sanitary and watermain services are available to accommodate the proposed development proposed at a density greater than 250 persons per hectare;
 - iii) The proposal does not address concerns related to shadow, overlook and privacy for adjacent townhouse dwellings on Frances Avenue;
 - iv) The proposal has not demonstrated appropriate transitions in building massing and height; and,

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- v) The proposal does not provide satisfactory transitions in the form of intervening land uses, visual barriers or separation distance.

EXECUTIVE SUMMARY

This Report is in response to Delegation requests made at the April 16, 2019 Planning Committee with respect to Site Plan Control Application DA-19-020 for lands located at 310 Frances Avenue, Stoney Creek (see Appendix “A” to Report PED19115). Based on discussions at the Planning Committee meeting, Council adopted the following motion on April 24, 2019:

- (a) That staff be directed to report back to the Planning Committee on the proposed developments on the subject property, 310 Frances Avenue, with the Minutes of the Design Review Panel, and any studies required for future Site Plan approval, with staff recommendations for consideration by the Planning Committee; and,
- (b) That staff consult with the Ward Councillor to provide proper public notice.

The purpose of this Report is to:

- Provide a status update on the file, including a summary of all comments made to date by applicable City and regulatory agencies.
- Summarize all comments made on the development application by the Design Review Panel (DRP) at their meeting of April 11, 2019.
- Provide public access to Studies provided by the applicant in support of the proposed development in digital format to the public and Planning Committee.
- Provide a brief history and relevant background information regarding the subject lands.

HISTORICAL BACKGROUND

Background History

Development Applications OPA-08-019, ZAC-08-079

On February 10, 2010, City Council approved Official Plan Amendment and Zoning By-law Amendment applications for a change in zoning from the Residential Multiple “RM5-7” Zone, Modified, to the Mixed Use Commercial “MUC-4” Zone, Modified on the subject lands. The Official Plan Amendment was made under the Stoney Creek Official Plan as the UHOP was not in force and effect at that time. The policy modifications allowed for a mixed use development with the following key site-specific provisions:

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- No maximum building height;
- Minimum 585 dwelling units; and,
- No maximum lot coverage.

These modifications are consistent with the policy framework established through the South Shore Estates Draft Plan of Subdivision from the 1970's, which anticipated a total of 2,222 units within the subdivision. Through the 2010 approval, the Green Millen Shores Draft Plan of Subdivision anticipated 233 dwelling units, with the balance of undeveloped units to be accommodated on the subject lands, by establishing the minimum 585 dwelling unit zoning requirement.

Site Plan Control Application DA-19-020

On December 20, 2018, the owner of 310 Frances Avenue submitted Site Plan Control Application DA-19-020, which proposes to construct a tall building composed of three towers being 48, 54, and 59 storeys in height, 2,409 parking spaces within a four storey podium and two levels of underground parking, 400 sq m of commercial space, and a total of 1,836 dwelling units, eight of which are proposed as ground-related units (see Appendix "B" to Report PED19115). Driveway accesses are proposed from Frances Avenue and a common rooftop amenity space above the podium structure has been proposed.

As part of the submission, the following studies and plans were received (see Appendix "C" to Report PED19115):

- Grading Plan;
- Servicing Plan;
- Erosion and Siltation Control Plan;
- Stormwater Management Brief;
- Water / Wastewater Generation Report;
- Shadow Impact Analysis;
- Traffic Impact Study;
- Wind Assessment; and,
- Environmental Noise Impact Study.

Staff have conducted a review of these studies, which is outlined in Appendix "D" to Report PED19115.

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POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Provincial Planning Policy Framework

The Provincial Planning Policy Framework is established through the *Planning Act* (Section 3) and the Provincial Policy Statement (PPS 2014). Section 41(6) of the *Planning Act* states that “nothing in this section shall be deemed to confer on the council of the municipality power to limit the height or density of buildings to be erected on the land.”

Based on the above established parameters, the focus of the Site Plan Control Application is directed towards the design of the development as it implements the intent of the applicable Official Plan policies, Zoning By-law, and Site Plan Guidelines.

The *Planning Act* requires that all municipal land use decisions affecting planning matters be consistent with the PPS.

The mechanism for the implementation of the Provincial plans and policies is through the Official Plan. Through the preparation, adoption and subsequent Local Planning Appeal Tribunal approval of the City of Hamilton Official Plans, the City of Hamilton has established the local policy framework for the implementation of the Provincial planning policy framework. As such, matters of provincial interest (e.g. efficiency of land use, balanced growth, environmental protection and sensitive land uses) are reviewed and discussed in the Official Plan analysis that follows.

As the Site Plan Control application complies with the Official Plan and the relevant policies in the PPS, 2014, it is staff’s opinion that the application is:

- Consistent with Sections 3 and 41(6) of the *Planning Act*; and,
- Consistent with the Provincial Policy Statement.

Growth Plan for the Greater Golden Horseshoe (2017)

The proposal conforms to the Guiding Principles, Section 1.2.1 of the Growth Plan, as it is designed to prioritize intensification and higher densities. In addition, the Growth Plan provides direction for residential uses under the following policies:

“2.2.1.2. Forecasted growth to the horizon of this Plan will be allocated based on the following:

- c) within settlement areas, growth will be focused in:
 - i. delineated built-up areas;

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- ii. strategic growth areas;
 - iii. locations with existing or planned transit, with a priority on higher order transit where it exists or is planned; and
 - iv. areas with existing or planned public service facilities;
- d) development will be directed to settlement areas, except where the policies of this Plan permit otherwise;
- 2.2.1.4. Applying the policies of this Plan will support the achievement of complete communities that:
- a) feature a diverse mix of land uses, including residential and employment uses, and convenient access to local stores, services, and public service facilities;
- 2.2.1.7 New development taking place in designated greenfield areas will be planned, designated, zoned and designed in a manner that:
- a) supports the achievement of complete communities;
 - b) supports active transportation; and
 - c) encourages the integration and sustained viability of transit services.
- 2.2.1.2. The designated greenfield area of each upper- or single-tier municipality will be planned to achieve within the horizon of this Plan a minimum density target that is not less than 80 residents and jobs combined per hectare.

The subject lands are identified outside of the Built Boundary, as shown on Appendix “G” of the UHOP. The proposed development will contribute residential growth needed to support complete communities with an approximate density of 1,376 residents and jobs per hectare.

Based on the foregoing, the proposal conforms to the Growth Plan for the Greater Golden Horseshoe (2017).

Urban Hamilton Official Plan

The subject lands are identified as “Neighbourhood” on Schedule “E” – Urban Structure and designated “Neighbourhoods” on Schedule “E-1” – Urban Land Use Designations in the Urban Hamilton Official Plan (UHOP). The following policies, amongst others, apply to the application:

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Neighbourhoods

- “E.3.6.3 Local commercial uses may also be permitted on the ground floor of buildings containing multiple dwellings, provided the provisions of Section E.3.8 – Local Commercial are satisfied.
- E.3.6.4 High density residential uses shall be located within safe and convenient walking distance of existing or planned community facilities/services, including public transit, schools, and active or passive recreational facilities.
- E.3.6.7 Development within the high density residential category shall be evaluated on the basis of the following criteria:
- a) Development should have direct access to a collector or major or minor arterial road. If direct access to such a road is not possible, the development may be permitted indirect access to a collector or major or minor arterial roads from a local road upon which only a small number of low density residential dwellings are fronting on the local road.
 - b) High profile multiple dwellings shall not generally be permitted immediately adjacent to low profile residential uses. A separation distance shall generally be required and may be in the form of a suitable intervening land use, such as a medium density residential use. Where such separations cannot be achieved, transitional features such as effective screening and/or design features shall be incorporated into the design of the high density development to mitigate adverse impact on adjacent low profile residential uses.
 - d) Development shall:
 - i) provide adequate landscaping, amenity features, on-site parking, and buffering where required;
 - ii) be compatible with existing and future uses in the surrounding area in terms of heights, massing, and an arrangement of buildings and structures; and,
 - iii) provide adequate access to the property, designed to minimize conflicts between traffic and pedestrians both on-site and on surrounding streets.”

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The current design of the development provides 400 sq m of commercial use on the ground floor of the proposed podium structure. The development is not located within convenient walking distance of community facilities and services, public transit, or schools. The lands are, however, within walking distance of passive recreational facilities including Edgelake Park to the west and the Waterfront Trail to the north. The Hamilton Street Railway (HSR) has provided comments on the development application which identify that the area is currently serviced by Trans Cab with monitoring to determine if improved public transit should be extended to this area.

The subject lands are located adjacent to North Service Road, which is designated as a Minor Arterial Road on Schedule "C" – Functional Road Classification of the UHOP. Access to North Service Road is provided by Green Road, which is designated as a Local Road. This portion of Green Road does not contain low density residential dwellings which ensures Policy E.6.7 is met.

Two storey block townhouses and two storey street townhouse dwellings are located to the north and west of the subject lands, respectively. The current design of the development does not provide an intervening land use to transition from the high profile building to the adjacent low profile residential uses and has not demonstrated that the height and massing of the development is compatible with existing uses in the area. In addition, adequate buffering and landscaping has not been provided at the ground level. Extensive amenity features have been proposed above the four storey podium.

The proposed development is seeking a reduction of parking from 2,763 spaces to 2,409 spaces (2,387 residential spaces and 22 commercial parking spaces). The applicants have provided a Parking Justification Study as part of the Traffic Impact Study (TIS) prepared by Paradigm Transportation Solutions Ltd, dated December 2018, in support of the parking reduction. The rationale provided by the applicant is not supported by staff and revisions are required to the study before staff can evaluate a request for parking reduction. Additional comments regarding the Parking study have been outlined in Appendix "D" to Report PED19115.

Further, a preliminary review of the TIS has been conducted by staff which identifies that additional information is required in support of the development. Additional details regarding traffic infrastructure such as turn lanes, traffic signals, and configuration of site access is required to ensure the development minimizes conflicts between pedestrians and traffic.

Urban Design

Section B.3.3 of the UHOP provides Urban Design direction for new development. Some of the key policies, amongst others, include the following:

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“B.3.3.1.3 Create pedestrian oriented places that are safe, accessible, connected, and easy to navigate for people of all abilities.

B.3.3.1.4 Create communities that are transit-supportive and promote active transportation.

B.3.3.1.5 Ensure that new development is compatible with and enhances the character of the existing environment and locale.

B.3.3.2.4 Quality spaces physically and visually connect the public and private realms. Public and private development and redevelopment should create quality spaces by:

- a) organizing space in a logical manner through the design, placement, and construction of new buildings, streets, structures, and landscaping;
- b) recognizing that every new building or structure is part of a greater whole that contributes to the overall appearance and visual cohesiveness of the urban fabric;
- c) using materials that are consistent and compatible with the surrounding context in the design of new buildings;
- d) creating streets as public spaces that are accessible to all;
- e) creating a continuous animated street edge in urban environments;
- f) including transitional areas between the public and private spaces where possible through use of features such as landscaping, planters, porches, canopies, and/or stairs;
- g) creating public spaces that are human-scale, comfortable, and publicly visible with ample building openings and glazing;
- h) creating, reinforcing, and emphasizing important public vistas and view corridors; and,
- i) minimizing excessive street noise and stationary noise source levels through the design, placement, and construction of buildings and landscaping.”

The development proposes pedestrian oriented uses at the ground level of the development including eight ground related units along Green Road and 400 sq m of commercial floor area at the intersection of Green Road and Frances Avenue. The

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proposed 1,836 units will provide for population needed to support transit infrastructure. However, additional information is required from the applicant to demonstrate compatibility between the existing uses and the proposed development, including the design and placement of tower component.

“B.3.3.2.6 Where it has been determined through the policies of this Plan that compatibility with the surrounding areas is desirable, new development and redevelopment should enhance the character of the existing environment by:

- a) complementing and animating existing surroundings through building design and placement as well as through placement of pedestrian amenities;

B.3.3.3.2 New development shall be designed to minimize impact on neighbouring buildings and public spaces by:

- a) creating transitions in scale to neighbouring buildings;
- b) ensuring adequate privacy and sunlight to neighbouring properties; and,
- c) minimizing the impacts of shadows and wind conditions.”

The applicant is required through the Site Plan Control process to ensure the above noted policies have been met. In support, the applicant has submitted a Shadow Impact Analysis prepared by KNYMH Inc., dated December 19, 2018 and a Pedestrian Wind Assessment, prepared by RWDI, dated June 7, 2018 to demonstrate that the objectives of the Urban Design policies have been met (see Appendix “C” to Report PED19115). Additionally, the proposal was presented to the Design Review Panel on April 11, 2019 for feedback in context of how to best address these policies (see Appendix “E” to Report PED19115). A summary of staff’s comments, which state that insufficient details have been provided for both documents, has been outlined in Appendix “D” to Report PED19115. Additional information such as specific mitigation measures to wind impacts, and existing shadows within the neighbourhood, have not been provided to ensure that the development minimizes shadow and wind conditions.

Road and Railway Traffic Noise and Vibration

“B.3.6.3.7 A noise feasibility study, or detailed noise study, or both, shall be submitted as determined by the City prior to or at the time of application submission, for development of residential or other noise sensitive land uses on lands in the following locations:

- a) 100 metres of a minor arterial road, as identified on Schedule C – Functional Road Classification;

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- c) 400 metres of a truck route;
- d) 400 metres of an existing or proposed parkway or provincial highway (controlled access), as identified on Schedule C – Functional Road Classification;”

The subject lands are adjacent to North Service Road, which is identified as a minor arterial road on Schedule “C” – Functional Road Classification of the UHOP and is approximately 25 metres from the QEW, a Provincial Highway and a truck route. An Environmental Noise Impact Study has been submitted for staff’s review as part of the application (see Appendix “C” to Report PED19115). A summary of staff’s comments, which require additional clarification from the applicant, has been outlined in Appendix “D” to Report PED19115.

Natural Heritage System – Core Areas

C.2.3 It is the intent of this policy to preserve and enhance Core Areas and to ensure that any development or site alteration within or adjacent to them shall not negatively impact their natural features or their ecological functions.

The subject property is located within the boundaries of the Urban Hamilton Official Plan (UHOP). Based on Schedule B (Natural Heritage System) of the UHOP, Core Areas have been identified adjacent to the subject property. In this case, the Core Areas have been identified as Stoney Creek Watercourse 1 (regulated by the Hamilton Conservation Authority; HCA), Community Beach Ponds Environmentally Significant Area (ESA) and Lake Ontario.

Due to the size of the proposed development and the amount of glass/window surface there is concern that the function of the adjacent Core Areas may be impacted per Policy C.2.3 of the UHOP. These impacts include bird-window collisions, potential predation of local wildlife by pets, dumping and the introduction of invasive species within the ESA. Staff have requested that the owner demonstrate that the development meets bird friendly design best practices. A Bird Impact Assessment discussing the direct and indirect impacts on birds as well as implementation of specific bird-friendly design elements that will be incorporated into the development is required to address this comment (see Appendix “D” to Report PED19115). The Assessment will be required with the next comprehensive submission from the applicant.

Traffic Management

C.4.5.12 The City shall require transportation impact studies to assess the impact of proposed developments on current travel patterns and/or future transportation requirements. These studies shall be submitted as part of

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**SUBJECT: Site Plan Control Application for 310 Frances Avenue (PED19115)
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applications for Official Plan amendments, subdivision approvals, major rezoning and major site plan approvals.

- C.4.5.19 New development on properties adjacent to major arterial and minor arterials and where necessary, collector roads, shall include provisions for sufficient parking, loading, manoeuvring and off-street parking.”

The applicant has submitted a Traffic Impact Study (TIS) prepared by Paradigm Transportation Solutions Ltd., dated December 2018, in support of the proposed development. A copy of the report has been included in Appendix “C” to Report PED19115. Preliminary staff comments note that revisions to the TIS are required to meet Ministry of Transportation terms of reference.

A Parking Justification Study has been provided to support a reduction in parking from 1.5 parking spaces per unit to 1.3 parking spaces, which includes visitor parking. The rationale provided by the applicant is not supported by staff and revisions are required to the study before staff can evaluate a request for a parking reduction. Additional comments have been outlined in Appendix “D” to Report PED19115.

Based on the foregoing, the proposal, as currently proposed, does not comply with the UHOP.

Stoney Creek Zoning By-law No. 3692-92

The subject lands are zoned Mixed Use Commercial “MUC-4” Zone, modified in the former City of Stoney Creek Zoning By-law No. 3692-92. This zone permits mixed use developments in the form of commercial uses on the ground floor with residential uses above.

Through review of the application, staff have identified the following non-conformities to the “MUC-4” Zone, modified:

- Minimum rear yard setback of 0.681 m to Tower 1, whereas a minimum setback of 3.0 m is required;
- Minimum amenity space of 33,169.3 sq m, of which 1,806 sq m is proposed as a combined indoor amenity area, whereas 55,031 sq m of amenity area is required;
- Minimum landscaped open space of 20%, whereas 50% landscaped open space is required;
- Minimum 1.1 m landscaped strip along Frances Avenue and 0.6 m wide landscaped strip, whereas a minimum 5.0 m wide landscaped strip adjacent to a street is required;
- Minimum 3.6 m landscaped strip adjacent to another lot, whereas a minimum 9.0 m landscaped strip adjacent to another lot is required;

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- Minimum 2,387 residential parking spaces and 22 commercial parking spaces, whereas 2,763 residential parking spaces and 1 parking space for every 28 sq m of commercial parking spaces is required;
- To permit consolidated residential and commercial driveway access whereas commercial and residential parking shall be separate with separate points of ingress and egress; and,
- To permit residential uses, including associated amenity areas on the ground floor, whereas residential uses shall be located above the ground floor.

The scope of these non-conformities could be considered by the Committee of Adjustment through a Minor Variance application, given the variances meet the following tests under Section 45(1) of the *Planning Act*:

- The variance meets the general intent and purpose of the Official Plan;
- The variance meets the general intent and purpose of the Zoning By-law;
- The variance is desirable for the appropriate use of the land; and,
- The variance is considered minor in nature.

The impact of the variances is integral to the evaluation of the above noted tests. Accordingly, the scale of these variances may not be appropriate for this site but may be appropriate for another development. Staff have not indicated whether these variances can be supported from a Planning perspective as revisions and further evaluation is needed to address some of the other issues that been identified through the review process. Once the list of all variances has been finalized, staff will be coordinating with the local Ward Councillor and the applicants to determine how best to engage with the public. This engagement may be in the form of an information letter, or a public open house hosted by the Ward Councillor and / or the applicant.

RELEVANT CONSULTATION

Design Review Panel

The proposal was presented by the applicants to the DRP on April 11, 2019. DRP provided technical feedback from a design perspective which encouraged breaking up the main podium into separate towers and providing additional uses at the ground level. A full copy of the meeting minutes has been included in Appendix “E” to Report PED19115. The applicant has not formally submitted a revised proposal and continues to dialogue with staff on the design of the proposal.

Public Input

Several delegations were made at the April 16, 2019 Planning Committee in response to the proposed development. Overall, the following concerns were raised by the delegations:

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- Departure from the original approved development concept, approved on February 10, 2010;
- Opposition to proposed density;
- Opposition to proposed height;
- Development out of scale with the surrounding neighbourhood;
- Reduction of provided parking as on-street parking in the neighbourhood cannot be accommodated;
- Adjacent properties will be negatively impacted by shadow;
- Stormwater management impacts;
- Impacts on migratory bird patterns; and,
- Traffic congestion.

Section 41(6) of the *Planning Act* does not give City Council, or its designates, the authority to limit the height and density of proposed buildings through the Site Plan application process. The intent of the Site Plan Control process is to evaluate the details of development as it implements applicable Official Plan policies, the Zoning By-law, and meets appropriate design guidelines not limited to planning, engineering and transportation perspectives. The concerns noted above will be addressed through the technical review of the Site Plan Control Application based on this lens.

Two of the delegations submitted materials in support of the development per the following items:

- Suburban neighbourhoods can function in harmony with high rise developments;
- Development will provide condo ownership and rental opportunities;
- Encourage affordable home ownership;
- Development will encourage job growth;
- Encourage transit services in the area; and,
- Development includes high quality landscaping.

All of the comments above will be considered as part of the final approved Site Plan process.

Development Review Team Meeting

On April 24, 2019, the Ward Councillor and City staff met with the applicants to discuss the technical review of the application. A summary of staff's comments, which include all commenting agencies and departments, has been included in Appendix "D" to Report PED19115. The following key issues have been raised by staff as concerns for the development:

- Site servicing (sanitary sewers, watermain capacity and stormwater management, see Appendix "D" to Report PED19115);

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- Traffic Impact;
- Parking;
- Site Design;
- Bird Friendly Design;
- Shadow Impact;
- Wind Impact; and,
- Noise Impact.

Based on the above, the development has been referred back to the applicant for revisions to the site design and adjustments to the technical studies. Staff have scheduled meetings with the applicants to address these concerns. A revised proposal that addresses these comments has not been received to date.

Next Steps

Based on the concerns from staff and commenting agencies, as well as feedback from the public, staff are not in a position to issue Conditional Approval of the proposal in its current form. The applicant will be working with staff to refine the development proposal per applicable policies and guidelines. Once the development has been adjusted, detailed revisions to the supporting studies will be requested for staff's review. Staff will again coordinate with the local Ward Councillor regarding on-going public engagement as part of subsequent submissions.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement & Participation

Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Healthy and Safe Communities

Hamilton is a safe and supportive city where people are active, healthy, and have a high quality of life.

Clean and Green

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Built Environment and Infrastructure

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

Our People and Performance

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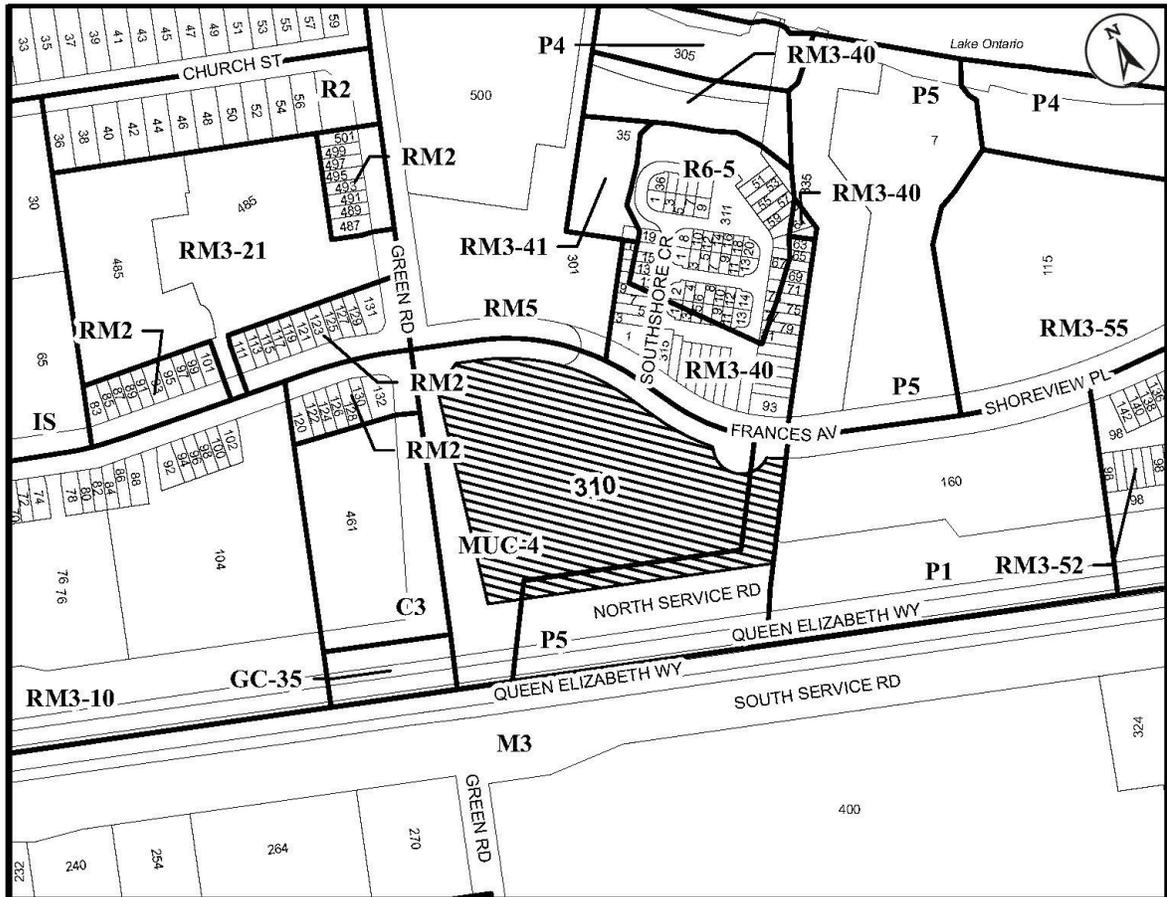
APPENDICES AND SCHEDULES ATTACHED

- Appendix "A" – Location Map
- Appendix "B" – Site Plan & Elevations
- Appendix "C" – Technical Studies
- Appendix "D" – Comment Summary
- Appendix "E" – DRP Minutes

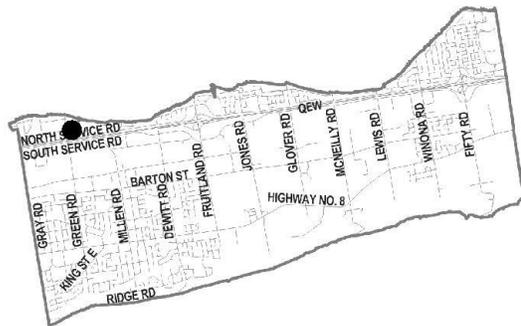
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● Site Location



Key Map - Ward 10

Location Map



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT

File Name/Number:
DA-19-020

Date:
May 2, 2019

Appendix "A"

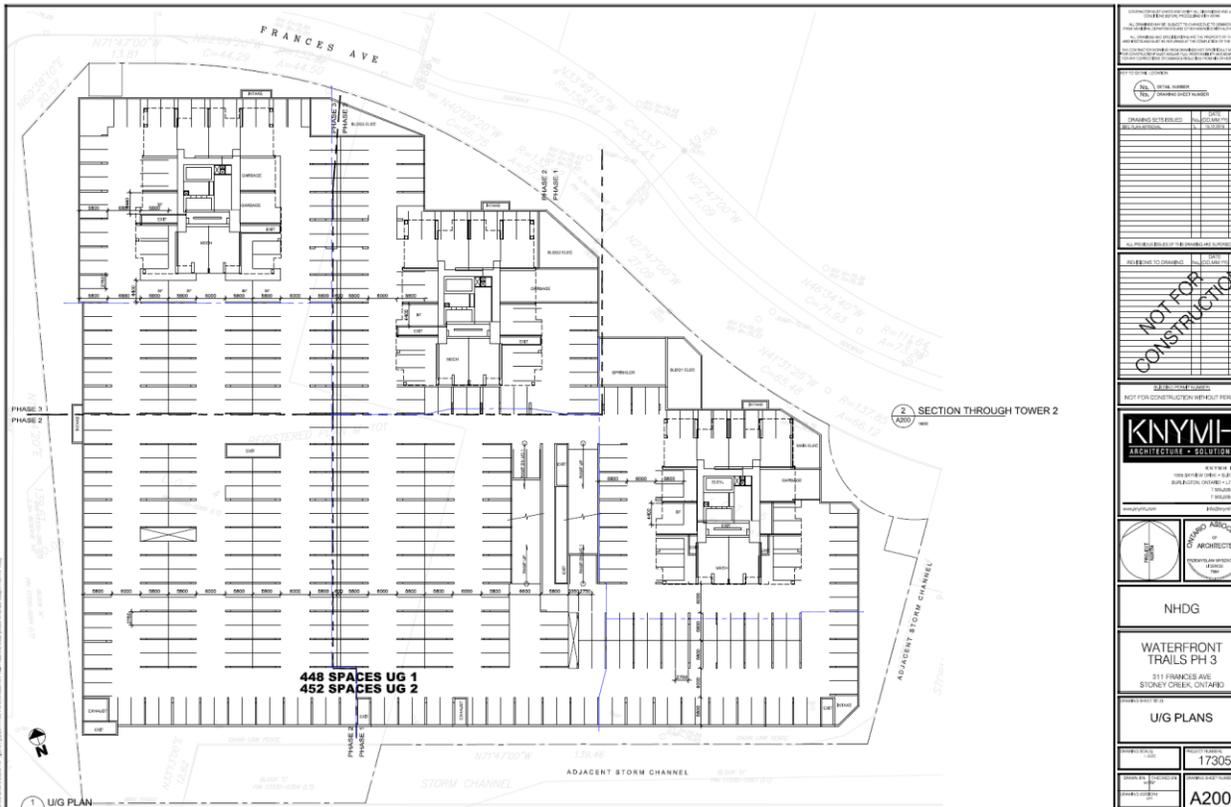
Scale:
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Planner/Technician:
MS/NB

Subject Property



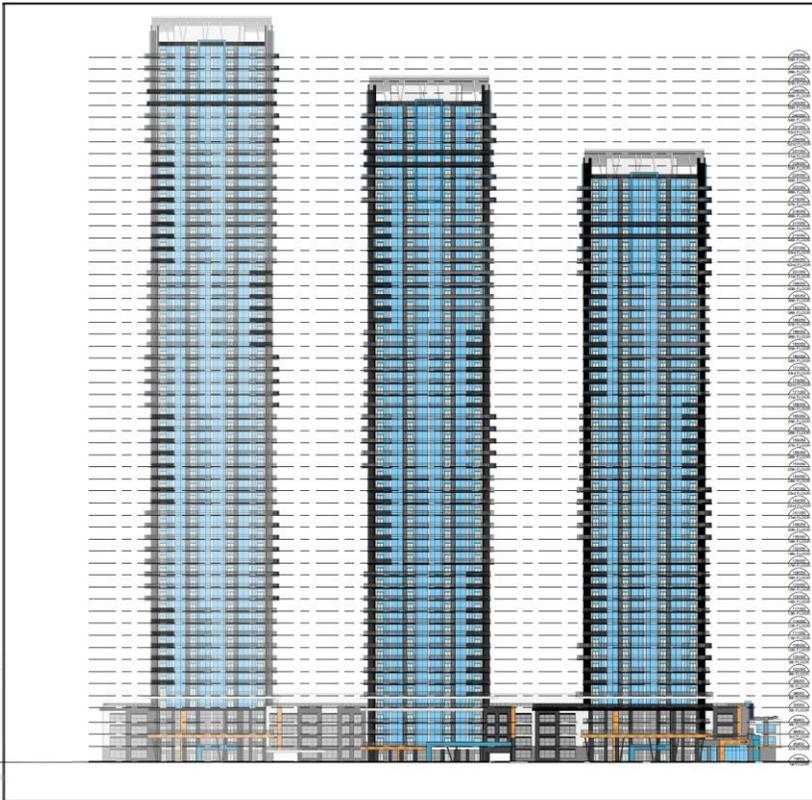
310 Frances Avenue, Stoney Creek
(Ward 10)



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NHDG WATERFRONT TRAILS PH 3 311 FRANCES AVE STONEY CREEK, OHIO 44224	
U/G PLANS	
SHEET NO.	17305
PROJECT NO.	A200



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NHDG WATERFRONT TRAILS PH 3 311 FRANCES AVE STONEY CREEK, OHIO 44224	
GROUND LEVEL PLAN	
SHEET NO.	17305
PROJECT NO.	A201



NOT FOR CONSTRUCTION

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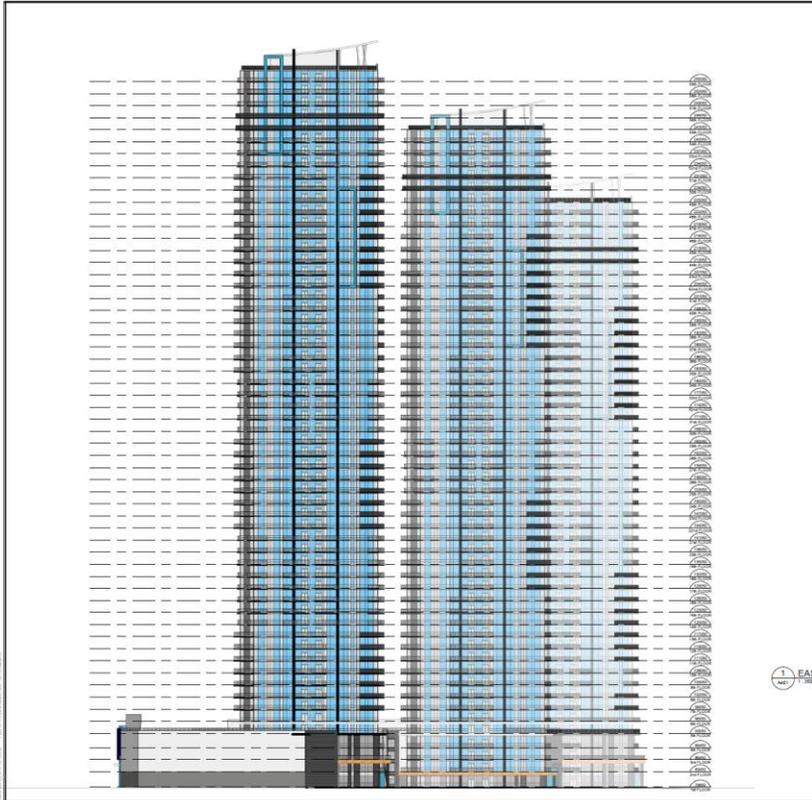
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WATERFRONT TRAILS PH 3
 FRANCES AVENUE, HAMILTON, ONTARIO

ELEVATIONS

17305

A400



NOT FOR CONSTRUCTION

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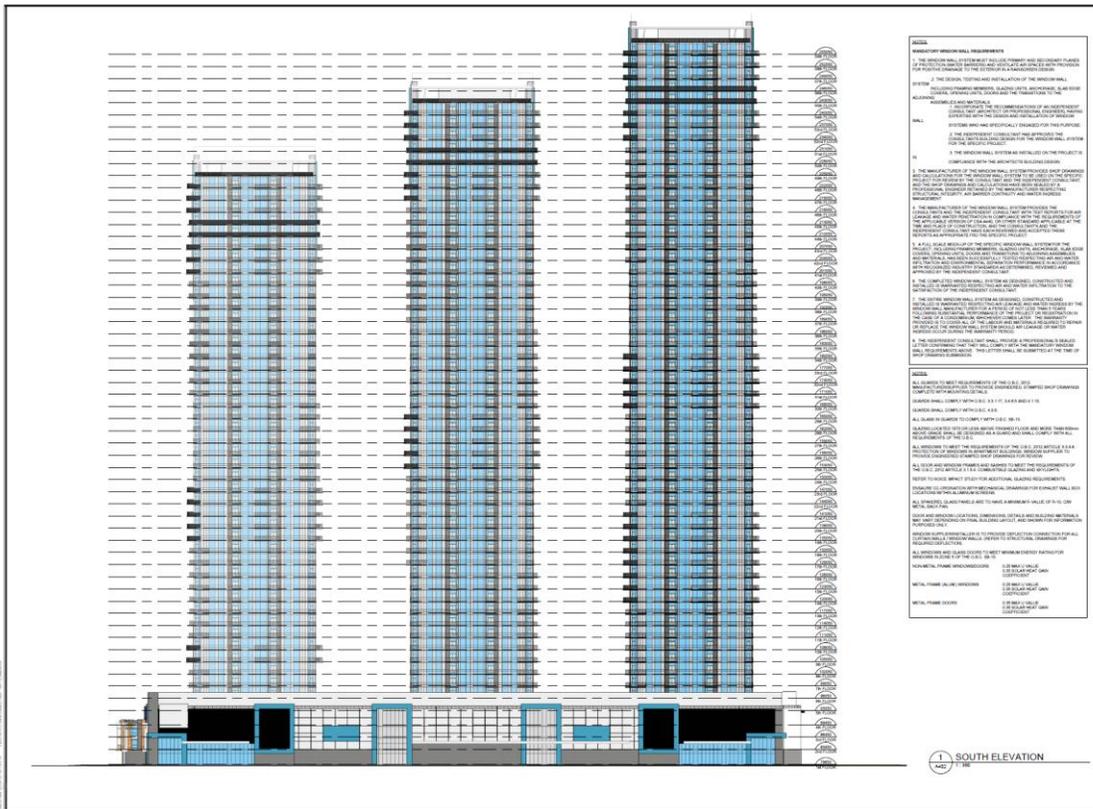
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WATERFRONT TRAILS PH 3
 FRANCES AVENUE, HAMILTON, ONTARIO

ELEVATIONS

17305

A401



1 SOUTH ELEVATION

DATE: 17305	
NO.:	A402

NOT FOR CONSTRUCTION WITHOUT PERMIT

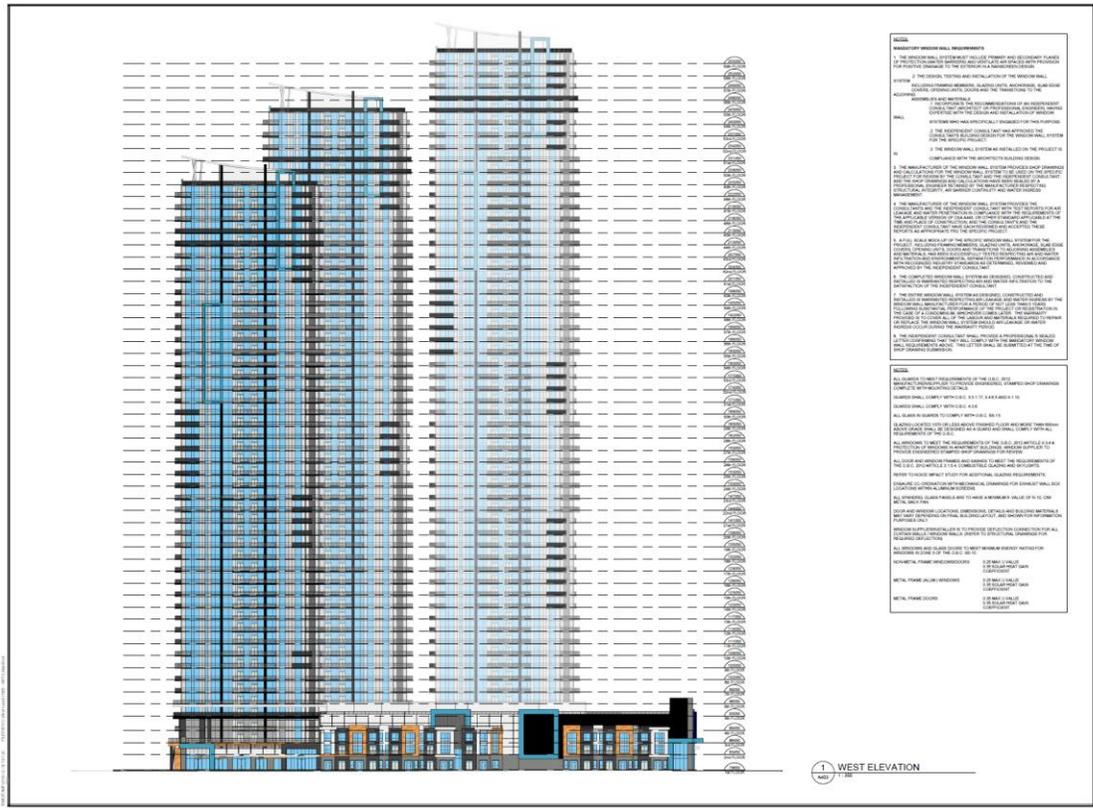
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ELEVATIONS



1 WEST ELEVATION

DATE: 17305	
NO.:	A403

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FRANCES AVENUE, HAMILTON, ONTARIO

ELEVATIONS



Waterfront Trails Transportation Impact, Parking Justification & TDM Options Study

Paradigm Transportation Solutions Limited

December 2018

Project Number

180010

December 2018

Client

New Horizon Development Group
(Sapphire) Inc.

69 John Street South, Unit 400
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Client Contact

Mike Foley

Consultant Project Team

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Waterfront Trails Transportation Impact, Parking Justification & TDM Options Study

Signatures and Seals



Signature



Engineer's Seal

Disclaimer

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Paradigm Transportation Solutions Limited

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained by New Horizon Development Group (Sapphire) Inc. to conduct this Transportation Impact, Parking Justification and TDM Options Study for the proposed residential and commercial development to be located at 310 Frances Avenue in the City of Hamilton, Ontario.

This study includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for each phase of development, a parking assessment, transportation demand management assessment and recommendations for any required roadway improvements to accommodate future traffic conditions.

Development Concept

The proposed commercial development is located on the south side of Frances Avenue east of Green Road. The property is currently vacant land bordered by residential dwellings to the north and a small commercial development to the west.

The subject site is proposed to include a total of 1,836 residential units in three high-rise buildings with a total of 400 square metres (4,306 square feet) of ground-floor commercial retail space. An on-site parking supply of 2,438 spaces is proposed to service the residential component of the site, including 20 barrier free spaces. Seven (7) parking spaces are proposed for the commercial component. All parking spaces are provided in an above-grade parking structure.

The development will be constructed in three phases with one building completed every two years from 2021 (Phase 1) to 2025 (full build-out). Vehicular access to the site is proposed via four (4) all-turns driveway connections to Frances Avenue. These driveways (herein referred to as "Site Access") are planned to be stop-controlled on the minor road (driveway) approach.

Conclusions

Based on the investigations carried out, it is concluded that:

Existing Traffic Operations

Under existing traffic conditions, all intersections within the study area are operating at acceptable levels of service (LOS) during the AM and PM peak hours. The following critical movement is noted:

- ▶ North Service Road and Green Road:

- Southbound left-turn movement – LOS D during the PM peak hour with a v/c ratio of 0.28. The low v/c ratio on this movement indicates the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

Development Generated Traffic

At full build-out, the development is forecast to generate 556 and 666 trips during the AM and PM peak hours, respectively.

2021 Background Traffic Operations

Under 2021 background traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movement is noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS D with a v/c of 0.32 during the AM peak hour and LOS F with a v/c of 0.57 during the PM peak hour. The low to moderate v/c ratios indicate the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

2021 Total Traffic Operations (Phase 1)

Under 2021 total traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS E with a v/c ratio of 0.58 during the AM peak hour and LOS F with a v/c ratio of 1.25 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 11 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.59 during the AM peak hour; and
 - The moderate v/c ratios during the AM peak hour indicate the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

2023 Background Traffic Operations

Under 2023 background traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 0.62 during the AM peak hour and LOS F with a v/c ratio of 1.40 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 16 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.62 during the AM peak hour; and
 - The moderate v/c ratios during the AM peak hour indicate the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

2023 Total Traffic Operations (Phase 2)

Under 2023 total traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS E with a v/c ratio of 0.93 during the AM peak hour and LOS F with a v/c ratio of 2.66 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 15 metres during the AM peak hour and 51 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.95 during the AM peak hour; and
 - Overall intersection – LOS E during the PM peak hour.

2025 Background Traffic Operations

Under 2025 background traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 1.0 during the AM peak hour and LOS F with a v/c ratio of 2.97 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 21 metres during the AM peak hour and 55 metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 1.01 during the AM peak hour; and
 - Overall intersection – LOS D during the AM peak hour and LOS F during the PM peak hour.

2025 Total Traffic Operations (Full Build-Out)

Under 2025 total traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ Green Road and Frances Avenue:
 - Westbound left-turn/through/right-turn movement – LOS D with a v/c ratio of 0.79 during the AM and 0.74 during the PM peak hour.
- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 1.40 during the AM peak hour and a v/c ratio of 5.47 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 59 metres during the AM peak hour and 55+ metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 1.33 during the AM peak hour; and
 - Overall intersection – LOS F during the AM and PM peak hours.

Remedial Measures

The following remedial measures are required to provide acceptable levels of service at the study area intersections:

- ▶ Traffic signals at the intersection of North Service Road and Green Road. Although not warranted until 2025, the signals should be installed as part of Phase 1 of the development (2021) to provide acceptable levels of service on all approaches;
- ▶ A separate westbound right-turn lane should be provided at the intersection of North Service Road and Green Road at the 2025 horizon. This lane warrants 7.5 metres of storage and 120 metres of taper and parallel lane; however, due to environmental constraints, only 10 metres of storage and 15.8 metres of taper can be provided within the right-of-way without significant reconstruction;
- ▶ A separate westbound left-turn lane should be provided at the intersection of Green Road and Frances Avenue at the 2025; and
- ▶ The southbound left-turn lane at North Service Road and Green Road should be increased by 15 metres by the 2025 horizon.

These improvements are directly related to the increase in traffic due to development of the subject site.

Parking Assessment

City of Stoney Creek By-law Parking Requirements

Based on the City of Stoney Creek Zoning By-law 3692-92, a total of 3,090 parking spaces will be required to service the residential component of the site. A total of 2,438 spaces are proposed. This is a deficiency of 652 spaces or 21% of the By-law parking requirement.

Proxy Site Survey Data

Parking utilization surveys were undertaken at a proxy site in Burlington, Ontario (3060/3070 Rotary Way). Based on the maximum observed demand at the proxy sites, a total of 2,295 spaces would be required to service the site during the peak weekday period. A total of 2,438 spaces are proposed. This is a surplus of 143 spaces or 106% of the proxy site parking requirement.

Overall Findings

The Zoning By-law results in a deficiency in parking of 652 spaces and the proxy site data results in a surplus of 143 spaces. The proxy site data provides an accurate representation of the parking demands for the site as they are based on area-specific data and not a general Zoning By-law. Additionally, it further supports a reduction in parking requirements for the site. Therefore, the proposed parking supply should adequately accommodate the parking demands of the site.

TDM Options

The proposed site with nearby connections to bicycle facilities and transit routes has the potential to be an accessible development. Further enhancing these elements inside and outside the boundaries of the development will ensure these opportunities do not go unused.

By incorporating the TDM options contained in this report, such as improving walking and cycling facilities, reducing the parking supply and developing individualized travel plans for residents (alternative mode trip planning, carpool arrangements, etc.), the site will set the tone for the surrounding area in helping to achieve the City's long-term transportation goals.

Recommendations

Based on the findings of this study, it is recommended that:

- ▶ The City of Hamilton recognize the conclusions drawn above;
- ▶ The site be allowed to be developed as planned;
- ▶ The site driveway connections operate under stop sign control;
- ▶ The City install traffic signals at the intersection of North Service Road and Green Road by buildout of Phase 1 in 2021. The signal timing and phasing should be optimized as required;

- ▶ A separate westbound right-turn lane with 10 metres of storage and 15.8 metres of taper should be provided at the intersection of North Service Road and Green Road at the 2025 horizon;
- ▶ A separate westbound left-turn lane with 45 metres storage should be provided at the intersection of Green Road and Frances Avenue at the 2025 horizon. This can be accomplished through pavement markings;
- ▶ The southbound left-turn lane at North Service Road and Green Road should be extended by 15 metres by the 2025 horizon. This can be accomplished through pavement markings; and
- ▶ The applicant should ensure proper pedestrian and cyclist connections from the surrounding roads to the buildings' main entrances;
- ▶ Current bus schedules are provided within the lobby of each building to further promote the use of transit; and
- ▶ The buildings' management should work with the buildings' residents to form a travel planning committee/team that will help develop individualized travel plans (alternative mode trip planning, carpool arrangements, etc.) for interested residents. To assist the committee/team, the applicant should consider providing a kiosk within the lobby of each building for use by the committee/team.

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1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained by New Horizon Development Group (Sapphire) Inc. to conduct this Transportation Impact, Parking Justification and TDM Options Study for the proposed mixed-use development located at 310 Frances Avenue in Hamilton, Ontario. **Figure 1.1** details the study area and location of the subject site.

The development is proposed to be constructed in three (3) phases to include three (3) high-rise apartment buildings with a total of 1,836 units and 400 square metres (4,306 square feet) of commercial space. A total of 2,438 parking stalls are proposed to service the residential component of the site, including 20 barrier free spaces. Seven (7) parking spaces are proposed for the commercial component. Vehicular access to the site is proposed via four (4) all-turns driveway connections to Frances Avenue. The site is expected to be fully built and occupied by 2025.

1.2 Purpose and Scope

The purpose of this study is to assess the impacts of the subject site on the adjacent roadway network, to determine the improvements necessary (if any) to mitigate impacts and to assess the adequacy of the proposed parking supply.

The scope of the study includes the following:

- ▶ Determination and assessment of the current traffic conditions in the vicinity of the site;
- ▶ Determination and assessment of the additional traffic that will be generated by the proposed development;
- ▶ Analyses of the impacts of the additional traffic;
- ▶ Assessment of the adequacy of the proposed parking supply;
- ▶ Assessment of the transportation demand management measures integrated into the site plan; and
- ▶ Recommendations on the measures required to accommodate the traffic in a satisfactory manner.

This report has been prepared to meet the City of Hamilton Traffic Impact Study (TIS) Guidelines¹. This report assesses traffic conditions corresponding to the 2021 (Phase 1 opening year), 2023 horizon (Phase 2 opening year) and 2025 horizon (Phase 3 Full Build-Out), as required under the City of Hamilton Guidelines.

¹ City of Hamilton, *Traffic Impact Study Guidelines*, July 2009



● Denotes Study Area Intersection



Study Area and Subject Development Location

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Figure 1.1

Appendix A contains the pre-study consultation correspondence with the City of Hamilton staff.

1.3 Study Area Intersections

The following intersections were investigated in this study:

- ▶ Green Road and Frances Avenue (two-way stop control);
- ▶ North Service Road and Green Road (two-way stop control);
- ▶ North Service Road and Millen Road (two-way stop control); and
- ▶ The four (4) proposed site driveway connections to Frances Avenue (two-way stop control).

2 Existing Conditions

This section documents current traffic conditions, operational deficiencies and constraints experienced by the public travelling at the intersections within the study area. The operational deficiencies and constraints identified at this stage will be fundamental to the process of defining the required remedial measures.

2.1 Road Network

The characteristics of the roadways in the study area are described below. Reference was made to the City of Hamilton's Official Plan². All intersections within the study area are stop-controlled.

- ▶ **North Service Road** is an east-west minor arterial roadway between Centennial Parkway and Fruitland Road. North Service Road has an urban cross-section on the north side and rural cross-section on the south side in the westerly portion of the study area. North Service Road is designated as a full-time truck route by the City of Hamilton. Within the study area, the posted speed limit is 80 kilometres per hour. Parking restrictions are not posted; therefore, parking is subject to City of Hamilton Parking By-law regulations. The surrounding land uses are mainly public park lands and residential development.
- ▶ **Green Road** is north-south local roadway running from Lake Ontario in the north to North Service Road/Queen Elizabeth Way (QEW). Green Road continues south of the QEW; however, a direct connection is not provided across the highway. Within the study area, Green Road has a four-lane urban cross-section consisting of one travel lane and one parking "lane" in each direction. The speed limit is not posted; therefore, it is assumed to be 50 kilometres per hour. North of Frances Avenue, parking is permitted on the east side of the roadway and on the west side of the roadway in the vicinity of Church Street. South of Frances Avenue, parking restrictions are not posted; therefore, parking is subject to City of Hamilton Parking By-law regulations. The surrounding land use is mainly residential in nature.
- ▶ **Millen Road** is a two-lane minor arterial roadway with an urban cross-section that provides a continuous and direct connection from North Service Road to South Service Road and points further south across the QEW. Millen Road is designated as a full-time truck route by the City of Hamilton. The speed limit is not posted; therefore, it is assumed to be 50 kilometres per hour. Parking is prohibited on the south side of the roadway on the section parallel to Lake Ontario and stopping is prohibited on the west side of the roadway over the QEW.

² City of Hamilton. *Urban Hamilton Official Plan Schedule C – Functional Road Classification*. January 2017.

The surrounding land use is residential in nature north of the QEW and light industrial in nature south of the QEW.

- ▶ **Frances Avenue** is an east-west two-lane local roadway running from Grays Road in the west ending in a cul-de-sac east of Green Road. Within the study area, Frances Avenue has a two-lane urban cross-section. The speed limit is not posted; therefore, it is assumed to be 50 kilometres per hour. Parking restrictions are not posted; therefore, parking is subject to City of Hamilton Parking By-law regulations. The surrounding land use is mainly residential in nature.

On-street parking on the study area roads is regulated by the City of Hamilton On-Street Parking By-law No. 01-218³. The By-law prohibits vehicles from parking for longer than 12 hours at any given time.

Figure 2.1 illustrates the existing lane configurations and traffic control at the study area intersections.

2.2 Existing Transit Service

The City of Hamilton and GO Transit do not currently provide fixed route transit service within 400 metres of the subject site. The nearest fixed transit route in the study area is Route 56 – Centennial, which travels north - south from Eastgate Terminal Platform #3 to Lakeland Community Centre. Service runs daily from 10:00 AM to 6:10 PM on 45- minute headways. The nearest transit stop for Route 56 is located 1.9 kilometres west of the subject site.

However, the site is located within an area where Trans-Cab service is provided. Trans-Cab is a shared ride taxi service between Hamilton Street Railway (HSR) and Hamilton Cab. It is available to all passengers in Stoney Creek where buses do not currently provide service. The subject site is located within the Bell Manor and Levi-Loop Trans-Cab service area. This service picks up passengers and transports to the nearest bus stop transfer point:

- ▶ Confederation Parkway and North Service Road (2.7 kilometres from the subject site); or
- ▶ Grays Road and Barton Street (2.0 kilometres from the subject site).

Trans-Cab service is provided Monday through Saturday from 6:00 AM to 7:00 PM. This service costs \$0.50 in addition to the standard bus fare (\$3.00 or less depending on method of payment).

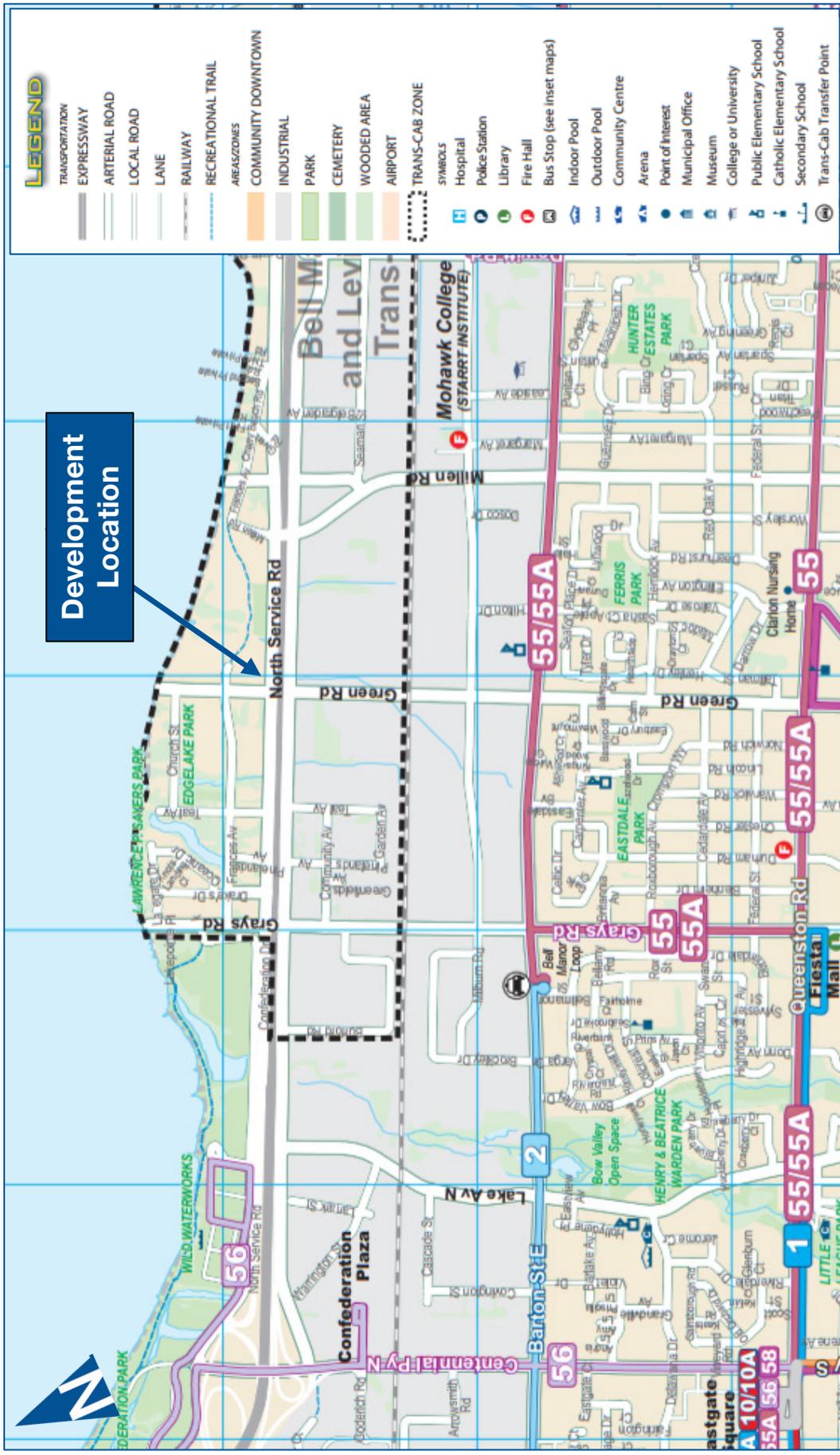
Figure 2.2 shows the location of the fixed transit routes and Trans-Cab area.

³ City of Hamilton. *On-Street Parking By-law No. 01-218*.



Existing Lane Configuration and Traffic Control

Figure 2.1



Source: City of Hamilton



Existing Transit Routes

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Figure 2.2

2.3 Active Transportation

2.3.1 Walkability

Pedestrian sidewalks are provided throughout the study area as follows:

- ▶ Green Road
 - Sidewalks are provided on both sides of the roadway.
- ▶ Millen Road
 - A sidewalk is provided on the north side of the roadway on the section that runs parallel to Lake Ontario.
- ▶ Frances Avenue:
 - Sidewalks are provided along both sides of the roadway.

2.3.2 Cycling

Several roadways within the study area are designated cycling/trail routes. The details of each are as follows:

- ▶ **Frances Avenue** from Grays Road to east of Green Road is identified on the City of Hamilton's Rural Cycling Map as an on-street bike route and a walking or hiking trail. East of Green Road, the trail continues eastward through the undeveloped lands as the extension of Frances Avenue and is designated as a paved multi-use trail (shared with pedestrians). This trail is also part of the Waterfront Trail system;
- ▶ **North Service Road** is designated as part of the Ontario Bicycle Route. The route is an "inter-regional cycling network of provincially and regionally important links that fill an existing gap needed for cycling routes between regions and extends to all provincial and international boundaries"; and
- ▶ **Millen Road/Frances Avenue/Shoreview Place** is designated as a signed on-street bike route throughout the study area. The portion of Millen Road that runs parallel to Lake Ontario (Shoreview Place) is designated as a paved multi-use trail that is part of the Waterfront Trail system. Parking is available on the north side of Shoreview Place.

Figure 2.3 shows the City of Hamilton's cycling and trail map, including the location of the subject site.



Source: City of Hamilton



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Existing Cycling and Trail Network

Figure 2.3

2.4 Existing Traffic Volumes

The weekday AM and PM peak hour traffic counts for the study area intersections were provided as follows:

- ▶ Green Road and Frances Avenue: collected by Paradigm staff on June 24, 2015;
- ▶ Green Road and North Service Road: collected by Paradigm staff on May 2, 2017; and
- ▶ Millen Road and North Service Road: collected by the City of Hamilton on May 6, 2016.

A growth rate of 2% per annum compounded was applied to all intersection volumes for the respective number of years to reflect 2018 conditions. This growth rate is also reflective of the yearly growth in average annual daily traffic (AADT) on the QEW between Fruitland Road and Centennial Parkway from 2005 to 2010⁴.

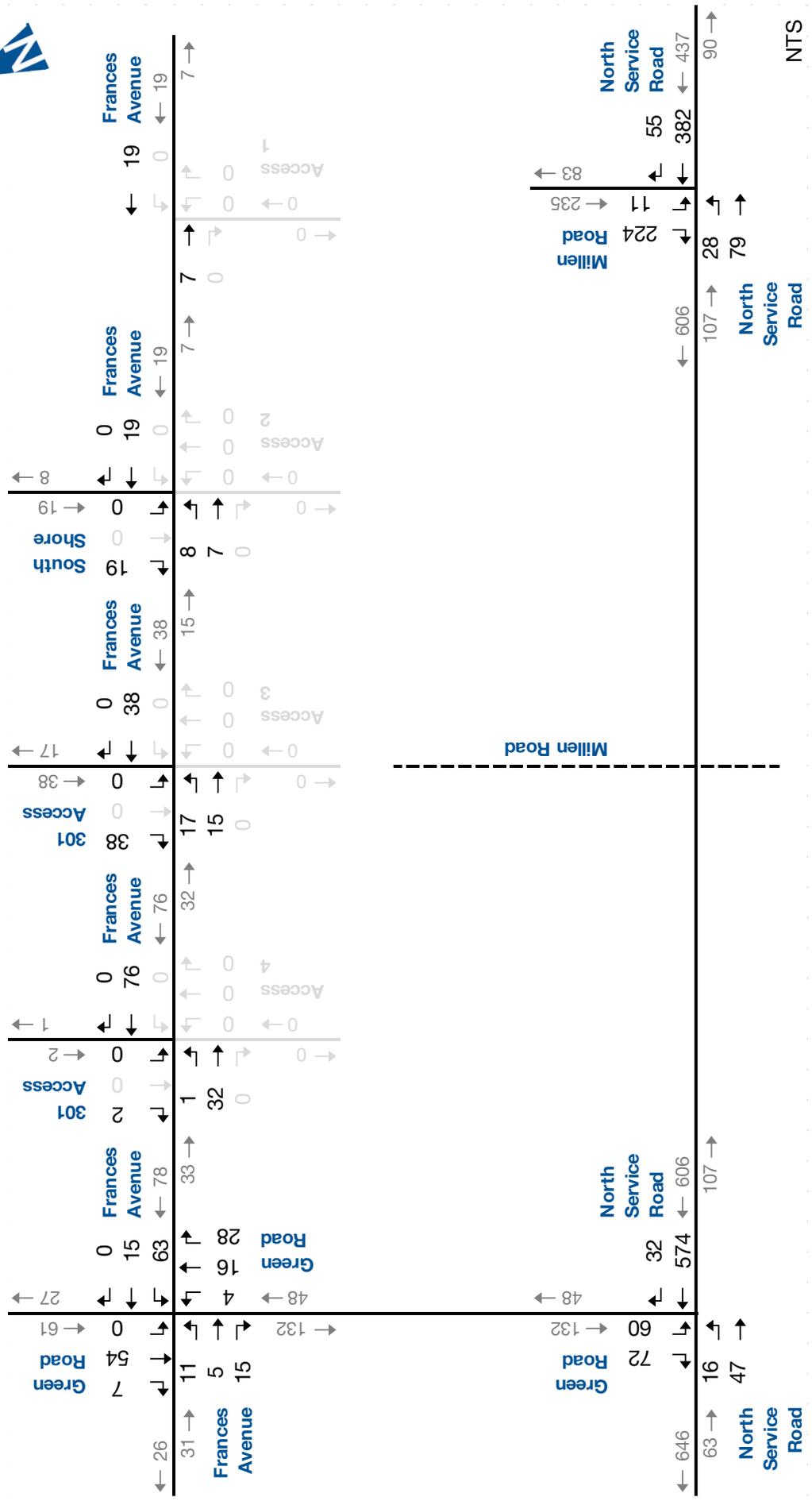
To ensure consistency, network traffic volumes on Green Road and North Service Road were balanced using the higher volume intersection. Any further resultant traffic volume discrepancies were equalized based on percent distribution.

Waterfront Trails is located in the Green Millen Shores Estates (GMSE) development area. Over the past couple of years, Paradigm has completed extensive analysis for a number of development applications within this area. The most recent study was completed in June 2017⁵ and included traffic forecasts for the AM and PM peak hours for the 2021 and 2026 horizon years. These forecasts include general traffic growth, the traffic generated by full development of the GMSE lands (not including the subject site) and the planned improvements to Confederation Park. It is noted that Paradigm assumed the developments at 311 and 321 Frances Avenue and 98 Shoreview were completed and fully occupied at the time of that study.

Figure 2.4 and **Figure 2.5** summarize the base year (2018) AM and PM peak hour traffic volumes, respectively. **Appendix B** contains the detailed count data.

⁴ Provincial Highways Traffic Volumes 1988-2010, Ministry of Transportation

⁵ Paradigm Transportation Solutions Limited. *101 Shoreview Place, City of Hamilton Transportation Impact Study*. June 2017.



Base Year (2018) AM Traffic Volumes

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Figure 2.4

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the delay experienced by drivers at intersections. The term “Level of Service” denotes how well a traffic movement operates under given traffic demands, lane arrangements, and traffic controls. Each level is determined by the average amount of control delay per vehicle. Control delay is the total delay associated with stopping for a signal or stop sign, and includes four components: deceleration delay, stopped delay, queue move up time and final acceleration delay.

Table 2.1 contains the level of service criteria for signalized and stop-controlled intersections. As shown, LOS A indicates small average control delays (less than 10 second per vehicle) whereas LOS F indicates intersection failure, which results in extensive vehicular queues and long delays (over 50 seconds per vehicle at an unsignalized intersection, and over 80 seconds per vehicle at a signalized intersection). LOS D is typically considered acceptable peak-hour performance in an urban setting, and lower LOS values are tolerable for short-term time periods during peak hours when heavier traffic volumes are expected.

TABLE 2.1: VEHICLE LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersections Average Total Delay (sec/veh)	Unsignalized Intersections Average Total Delay (sec/veh)
A	< = 10	< = 10
B	> 10 & < = 20	> 10 & < = 15
C	> 20 & < = 35	> 15 & < = 25
D	> 35 & < = 55	> 25 & < = 35
E	> 55 & < = 80	> 35 & < = 50
F	> 80	> 50

As per the City of Hamilton TIS Guidelines, the following defines critical movements for intersections:

- ▶ Volume to capacity ratios for through movements or shared through/turning movements that operate at 0.85 or greater for signalized intersections;
- ▶ Volume to capacity ratios for exclusive turning movements that operate at 0.90 or greater for signalized intersections;
- ▶ Level of service based on average delay per vehicle or individual movement is LOS D or greater for unsignalized intersections; and
- ▶ Estimated 95th percentile queue lengths exceed available turning lane storage.

The operations of the study intersections under existing, or base year (2018), traffic conditions were evaluated using Synchro 9 with HCM 2000 procedures. The intersection analysis considered three separate measures of performance:

- ▶ The LOS for each turning movement;
- ▶ The volume to capacity (v/c) ratio for each turning movement; and
- ▶ The 95th percentile queue lengths.

Table 2.2 summarizes the existing intersection operations, indicating the existing levels of service (LOS), volume to capacity ratios (V/C) and 95th percentile queues experienced within the study area for the AM and PM peak hours, respectively.

The analyses indicate that all intersections and movements within the study area currently operate at overall acceptable levels of service, with the following exception:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS D during the PM peak hour with a v/c ratio of 0.28. The low v/c ratio on this movement indicates the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

Appendix C provides the detailed Synchro 9 reports.

TABLE 2.2: BASE YEAR (2018) AM PEAK HOUR TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 9 0.04 1	> > >	A 9	< < <	A 10 0.10 3	> > >	A 10	< < <	A 1 0.00 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	A 5
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	A 9 0.02 1 125 125	A 0 0.03 0 -	> > >	A 2	< < <	A 0 0.39 0 -	> > >	A 0					C 16 0.17 5 40 35	> > >	B 14 0.16 5 -	C 15	A 3
	3 - North Service Road & Millen Road	TWSC	LOS Delay V/C Q Ex Avail.	A 9 0.03 1 90 89	A 0 0.05 0 -	> > >	A 2	< < <	A 0 0.28 0 -	> > >	A 0					B 15 0.40 15 -	> > >	B 15 0.40 15 25 10	B 15	A 5

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 2.3: BASE YEAR (2018) PM PEAK HOUR TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 10 0.06 2	> > >	A 10	< < <	B 10 0.06 2	> > >	B 10	< < <	A 1 0.01 0	> > >	A 1	< < <	A 1 0.00 0	> > >	A 1	A 4
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	A 8 0.08 2 125 123	A 0 0.44 0 -	> > >	A 1	< < <	A 0 0.20 0 -	> > >	A 0					D 33 0.28 9 40 31	> > >	B 10 0.06 1 -	C 22	A 2
	3 - North Service Road & Millen Road	TWSC	LOS Delay V/C Q Ex Avail.	A 8 0.05 1 90 89	A 0 0.43 0 -	> > >	A 1	< < <	A 0 0.11 0 -	> > >	A 0					B 13 0.21 6 -	> > >	B 13 0.21 6 25 19	B 13	A 3

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

3 Development Concept

3.1 Development Description

The proposed development is located at 310 Frances Avenue and is bordered by Frances Avenue to the north, Green Road to the east and North Service Road to the south.

The subject site is proposed to be developed in three (3) phases:

- ▶ Phase 1 (Tower 1) – Completed and occupied in 2021:
 - 59 storey residential apartment building with 670 units, comprising 448 one-bedroom units and 222 two-bedroom units;
 - A total of 889 parking spaces; and
 - Vehicular access via one (1) all-turns driveway connection to Frances Avenue (Site Access 1).
- ▶ Phase 2 (Tower 2) – Completed and occupied in 2023:
 - 54 storey residential apartment building with 615 units, comprising 410 one-bedroom units and 205 two-bedroom units;
 - A total of 817 parking spaces; and
 - Vehicular access via two (2) all-turns driveway connections to Frances Avenue (Site Access 2 and Site Access 3).
- ▶ Phase 3 (Tower 3) – Completed and occupied in 2025:
 - 48 storey residential apartment building with 551 units, comprising 369 one-bedroom units and 182 two-bedroom units;
 - 400 square metres (4,306 square feet) of commercial retail space;
 - A total of 739 parking spaces; and
 - Vehicular access via one (1) all-turns driveway connection to Frances Avenue (Site Access 4).

The development will also include an amenity building that will be available for all residents of the site by the conclusion of construction. The four (4) all-turns driveway connections to Frances Avenue (herein referred to as “Access”) are planned to be stop-controlled on the minor road (driveway) leg.

Figure 3.1 shows the proposed site plan.



Development Site Plan

Figure 3.1



3.2 Development Trip Generation

Trip generation information is used to forecast the anticipated level of traffic activity to occur as a result of the development of the site.

The Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition⁶ provide rates and equations to estimate the constituent component development peak hour traffic volumes. The following Land Use Codes (LUC) were utilized in this study:

- ▶ **LUC 222 – Multifamily Housing (High-Rise):** Includes apartments, townhouses, and condominiums that have more that 10 levels; and
- ▶ **LUC 820 – Shopping Centre:** Integrated group of commercial establishments that is planned, developed, owned and managed as a unit. The composition is related to its market area in terms of size, location and type of store. Provides on-site parking facilities sufficient to serve its parking demands.

The regression equations were utilized for the residential component of the development as all criteria for their use were met. Average rates were used for the commercial component estimates as all criteria for use of the equation rates were not met.

Note that in order to remain conservative in the trip generation estimates, reductions were not applied to account for the synergy between the residential and commercial components of the development. This decision was largely based on the small size of commercial retail space planned for the site and that it will not be constructed until the final phase of development.

Table 3.1 summarizes the resulting base trip generation and indicates that the site will generate a total of 556 AM peak hour trips and 666 PM peak hour trips upon full build-out.

⁶ Institute of Transportation Engineers. *Trip Generation Manual, 10th Edition*. 2017.

TABLE 3.1: TRIP GENERATION

Land Use	Unit of Measure	Units/ GFA	AM Peak Hour				PM Peak Hour				
			Rate	In	Out	Total	Rate	In	Out	Total	
PHASE 1	LUC 222 - Multifamily Housing (High-Rise)	Units	670	FCE ¹	48	152	200	FCE ²	144	92	236
	Total Phase 1					48	152	200		144	92
PHASE 2	LUC 222 - Multifamily Housing (High-Rise)	Units	615	FCE ¹	44	141	185	FCE ²	133	85	218
	Total Phase 2					44	141	185		133	85
PHASE 3	LUC 222 - Multifamily Housing (High-Rise)	Units	551	FCE ¹	40	127	167	FCE ²	120	76	196
	LUC 820- Shopping Centre	GFA	4,305	0.94	2	2	4	3.81	8	8	16
	Total Phase 3					42	129	171		128	84
Total New Trips					134	422	556		405	261	666

¹ T = 0.28(x) + 12.86

² T = 0.34(x) + 8.56

3.3 Development Trip Distribution and Assignment

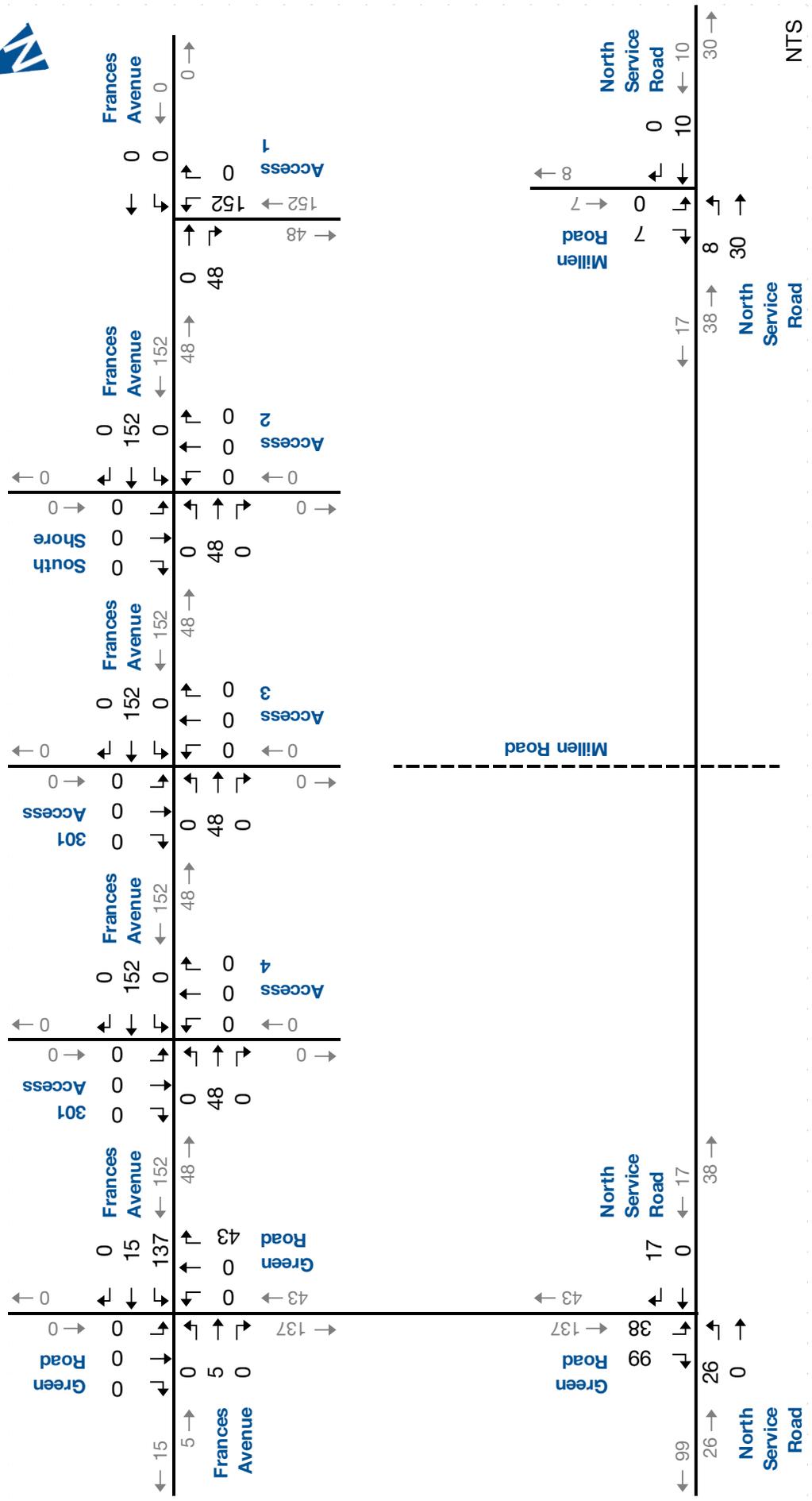
The estimated site generated trips were assigned to the roadway network based on the existing distribution of traffic within the study area as calculated in the June 2017 Paradigm study. The 2016 Transportation Tomorrow Survey (TTS) was not utilized to determine trip distribution data as much of the study area had not yet been fully developed when the TTS data was collected. **Table 3.2** details the estimated trip distribution for the development.

TABLE 3.2: TRIP DISTRIBUTION

Origin/Destination	IN	OUT
West via Frances Avenue	10%	10%
East via North Service Road	20%	20%
West via North Service Road	55%	65%
South via Millen Road	15%	5%
Total	100%	100%

Using the trip generation and trip distribution estimates, the site traffic was assigned to the road network. The site traffic is illustrated as follows:

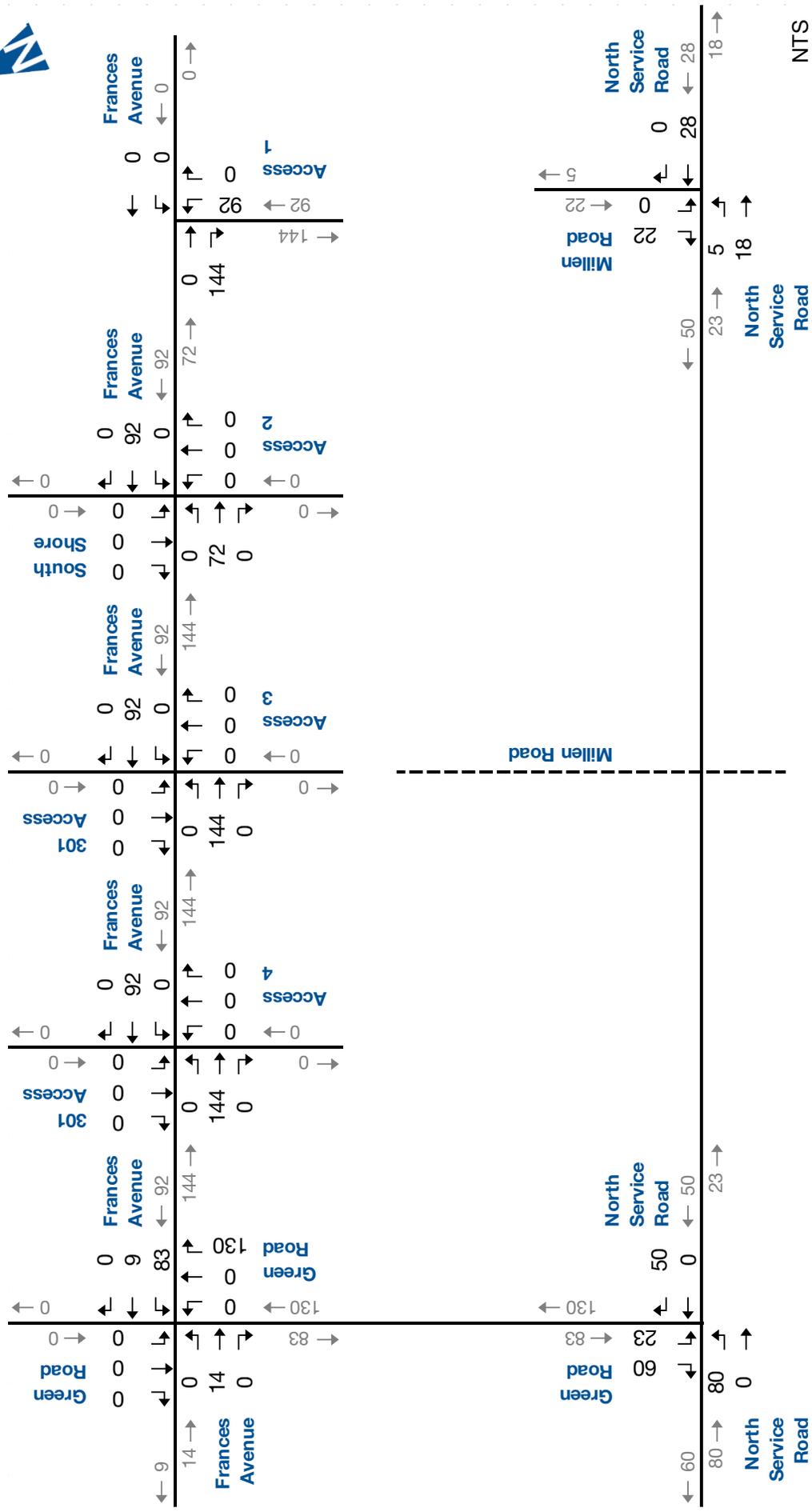
- ▶ **Figure 3.2 and Figure 3.3** - Phase 1;
- ▶ **Figure 3.4 and Figure 3.5** - Phase 2; and
- ▶ **Figure 3.6 and Figure 3.7** - Phase 3 (Full Build-Out)



Phase 1 AM Development Traffic Assignment

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

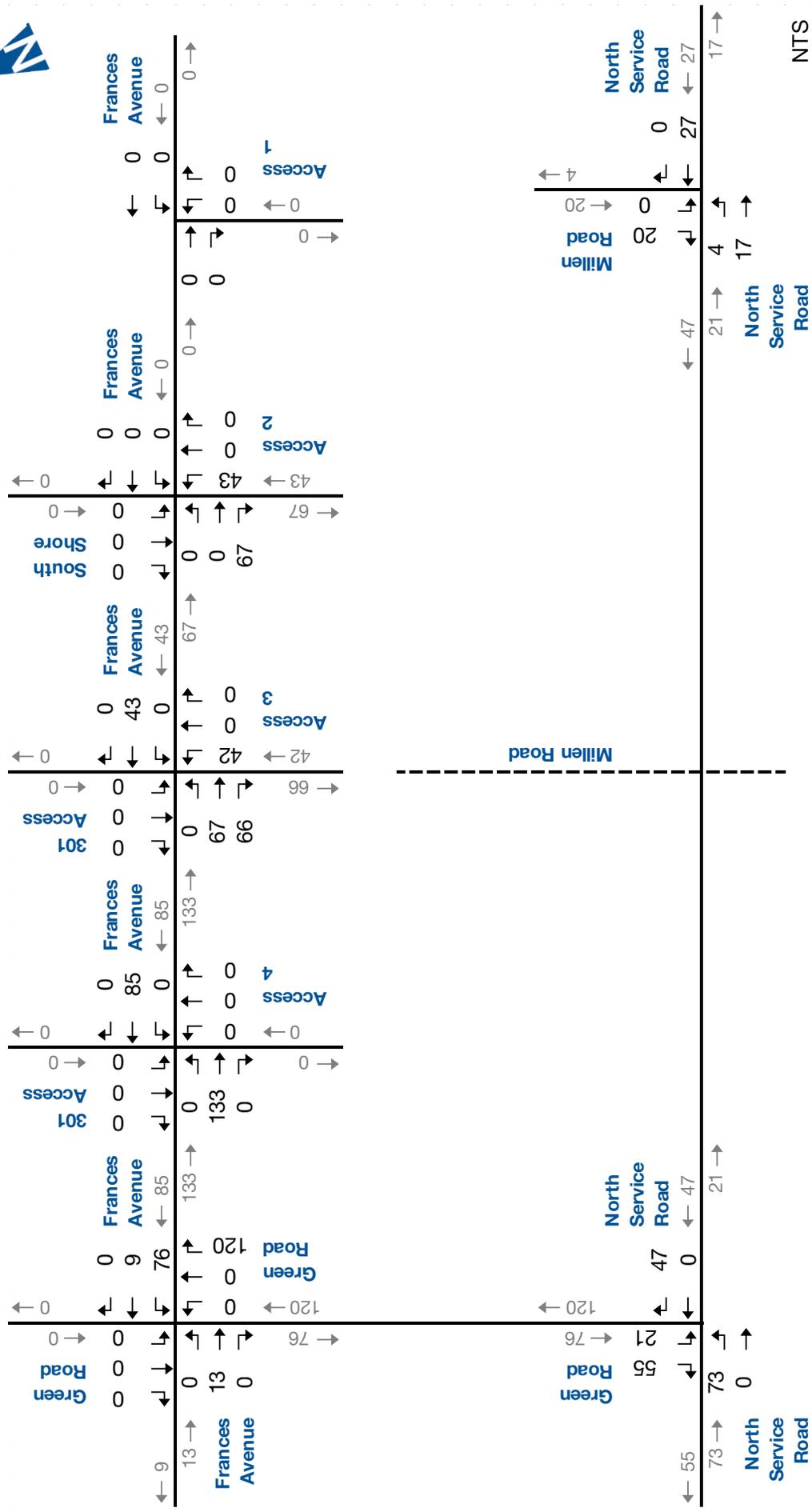
Figure 3.2



Phase 1 PM Development Traffic Assignment

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

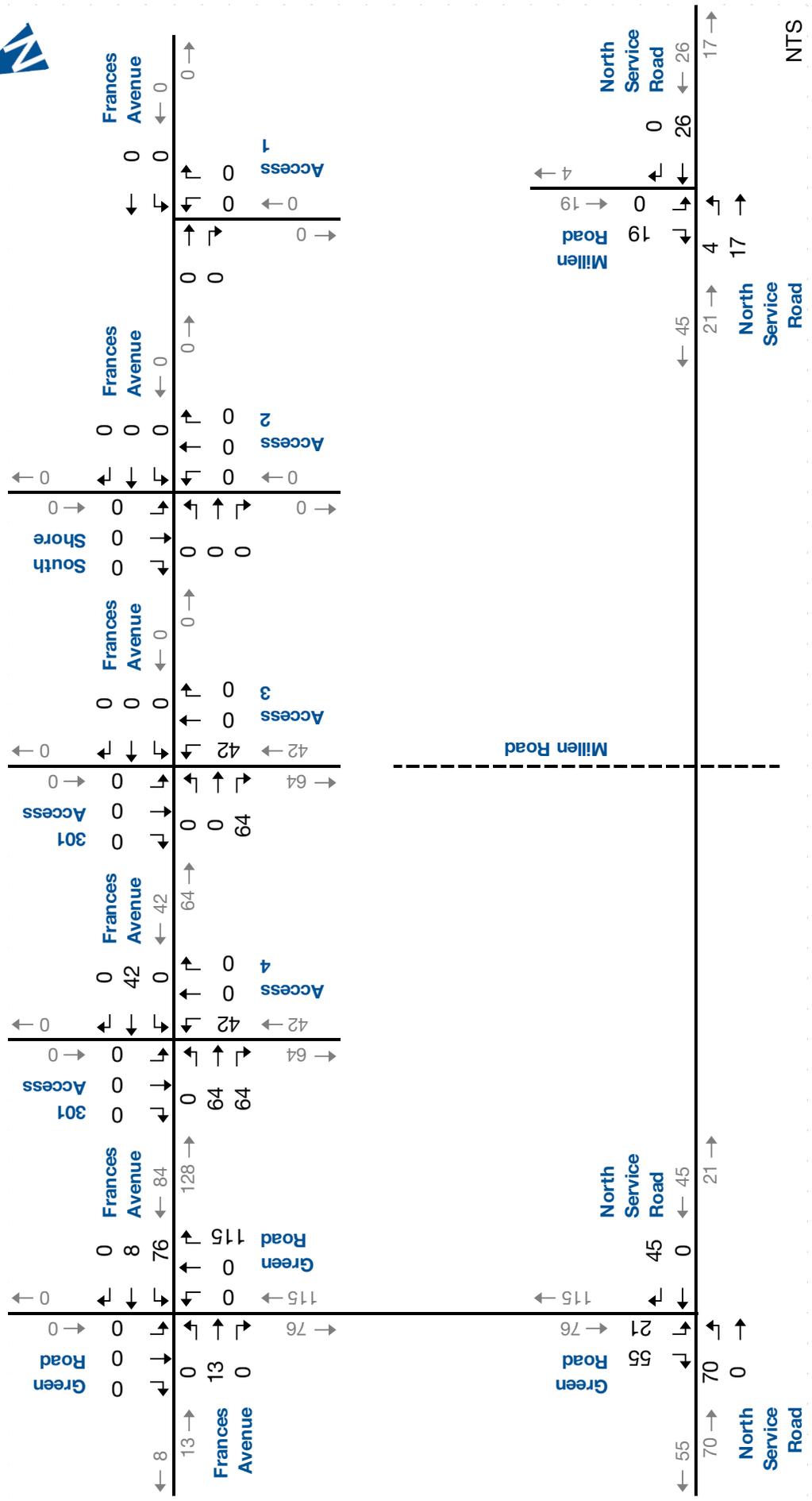
Figure 3.3



Phase 2 PM Development Traffic Assignment

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

Figure 3.5



Phase 3 (Full Build-Out) PM Development Traffic Assignment

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

Figure 3.7

4 Evaluation of Future Traffic Conditions

The assessment of future traffic conditions contained in this section includes estimates of future background and total traffic volumes and analysis for the 2021, 2023 and 2025 horizons. The future traffic volumes in the vicinity of the development will likely consist of increased non-site traffic volumes (generalized background traffic), traffic generated by other developments in the area and the traffic generated by the proposed development.

4.1 2021 Horizon

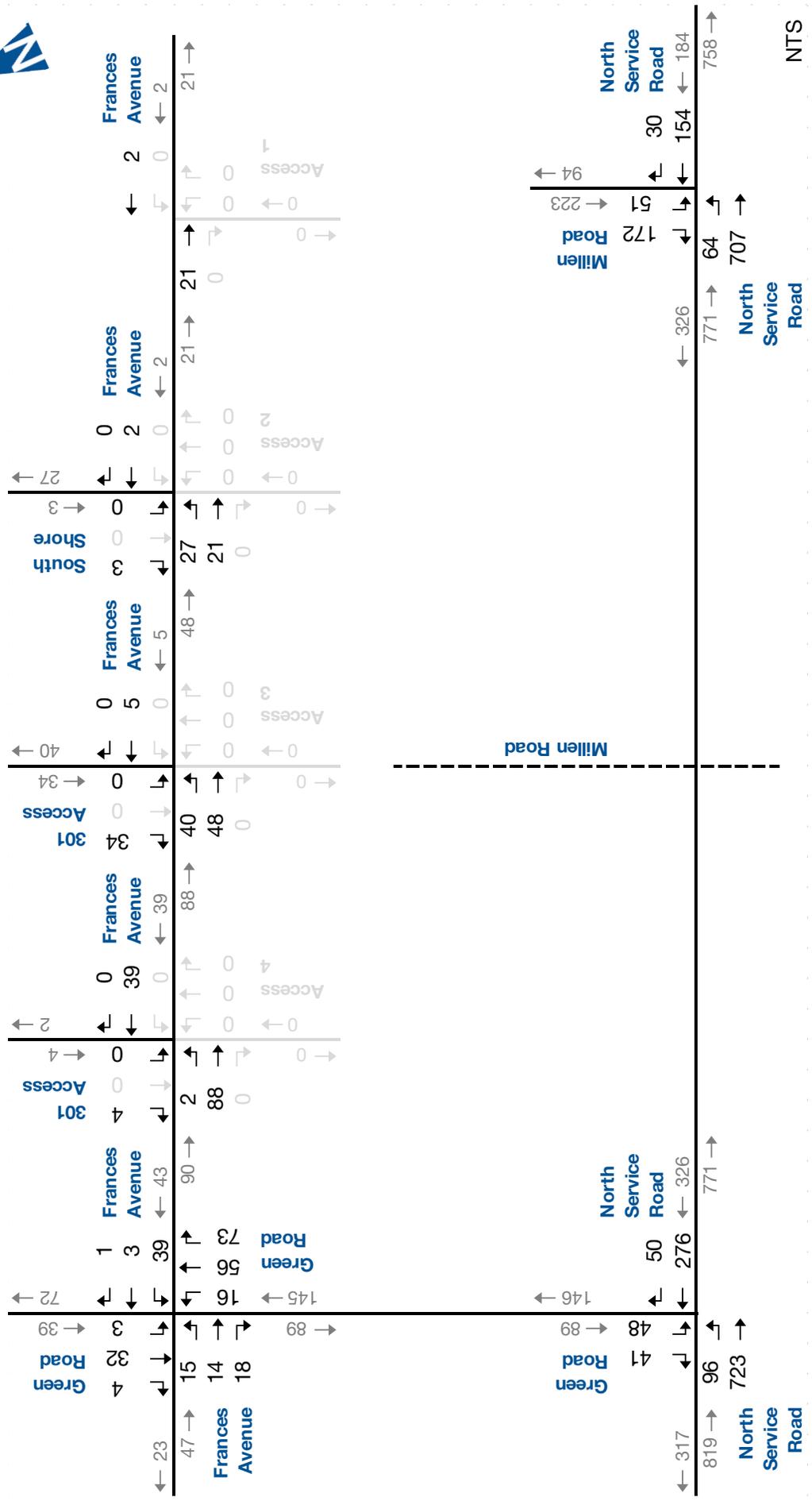
4.1.1 2021 General Background Traffic Growth

To derive the 2021 general background traffic volumes, the non-site traffic (generalized traffic growth) was increased by applying a compound growth rate of 2 percent per annum to the existing traffic volumes (6.1 percent total). Note that this growth rate is consistent with the growth rate used in the previous reports completed by IBI and Paradigm for the GMSE development area. This growth rate is also reflective of the yearly growth in AADT on the QEW between Fruitland Road and Centennial Parkway from 2005 to 2010.

Figure 4.1 and **Figure 4.2** show the 2021 general background traffic forecasts for the AM and PM peak hours.

4.1.2 Other Planned Developments

There are three other developments with traffic expected to impact the study area (Confederation Park, 8 Shoreview Drive, and 101 Shoreview Drive). The traffic generated by these developments were assumed to be completed by the 2021 and are included in the background traffic over and above the general background traffic growth. The development locations are shown in **Figure 4.3** and development information is as follows:



2021 PM Generalized Growth Background Traffic Forecasts

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
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Figure 4.2

NTS



Location of Other Area Developments (2021)

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Figure 4.3

Confederation Park

This development is expected to be completed by 2021 and includes:

- ▶ 1,400 square metres (15,000 square feet) of sit-down restaurant space;
- ▶ 5,100 square metres (55,000 square feet) of general retail space; and
- ▶ 4 sport fields.

This development is forecast to generate 114 trips (64 in, 50 out) during the AM peak hour and 329 trips (235 in, 94 out) during the PM peak hour as taken from the Transportation Assessment⁷ prepared by Dillon Consulting.

8 Shoreview Place

This development is expected to be completed by 2021 and includes:

- ▶ 130 congregate care facility units; and
- ▶ 50 square metres (538 square feet) of retail use (assumed to be coffee shop).

This development is forecast to generate 61 trips (32 in, 29 out) during the AM peak hour, and 42 trips (22 in, 20 out) during the PM peak hour. These forecasts were taken from the TIS⁸ previously prepared by Paradigm for this development.

101 Shoreview Place

This development is expected to be completed by 2021 and includes:

- ▶ 479 low-rise condominium/townhouse units.

This development is forecast to generate 321 trips (80 in, 241 out) during the AM peak hour, and 374 trips (216 in, 157 out) during the PM peak hour. These forecasts were taken from the TIS⁹ previously prepared by Paradigm for this development.

Figure 4.4 and **Figure 4.5** show the traffic volumes from the other developments in the study area. Note that not all trips generated by the other planned developments will enter the study area. The trips were assigned to the network based on the assignment detailed in their respective TIS reports.

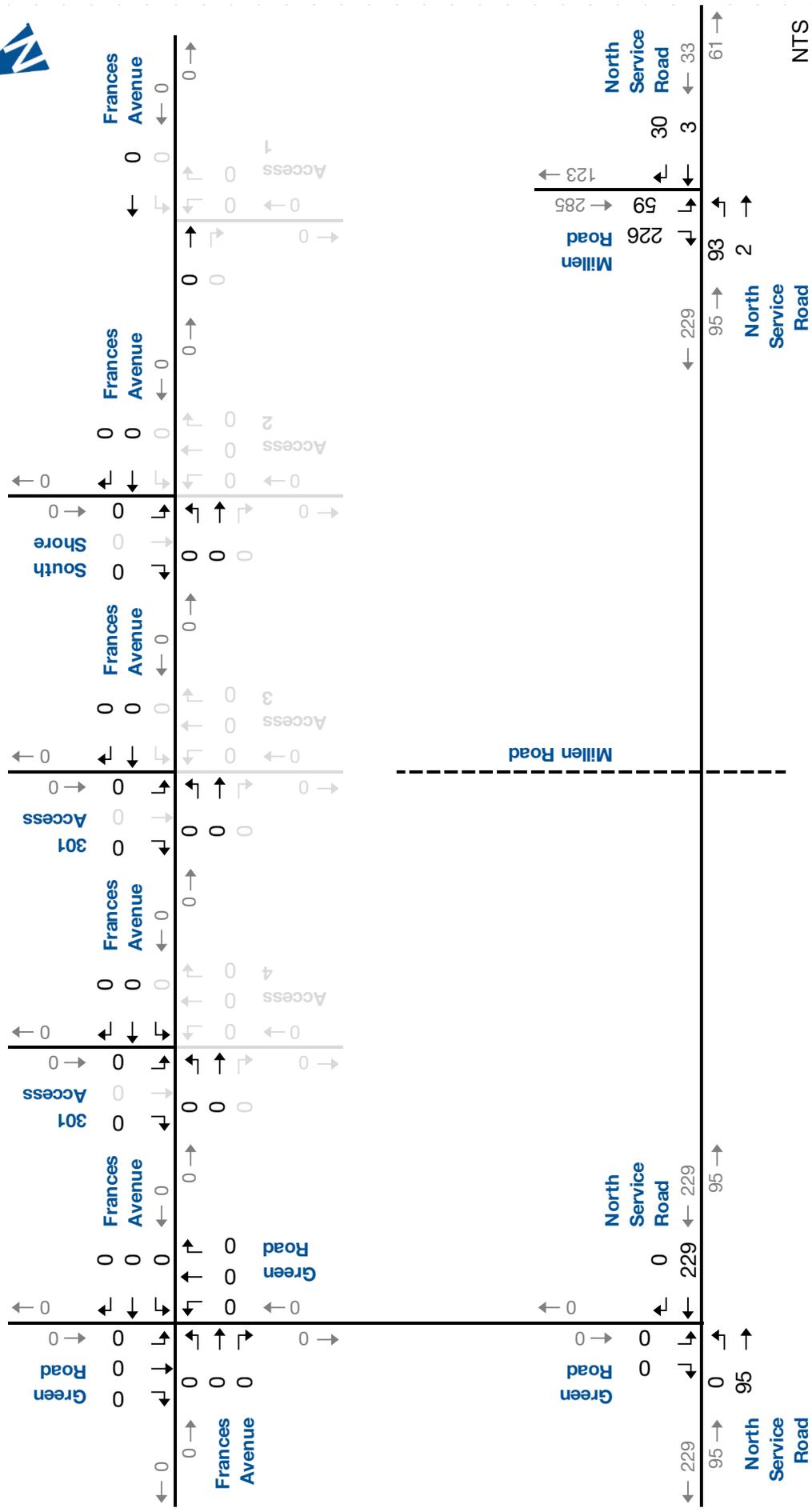
⁷ Dillon Consulting Limited. *Confederation Park Transportation Assessment*. June 2013.

⁸ Paradigm Transportation Solutions Limited. *98 Shoreview Place Transportation Impact Study*. November 2015

⁹ Paradigm Transportation Solutions Limited. *101 Shoreview Place Transportation Impact Study*. July 2017.

4.1.3 2021 Total Background Traffic Volumes

Figure 4.6 and **Figure 4.7** illustrate the 2021 total background traffic including the generalized background traffic and site traffic from the above-noted area developments for the AM and PM peak hours, respectively.

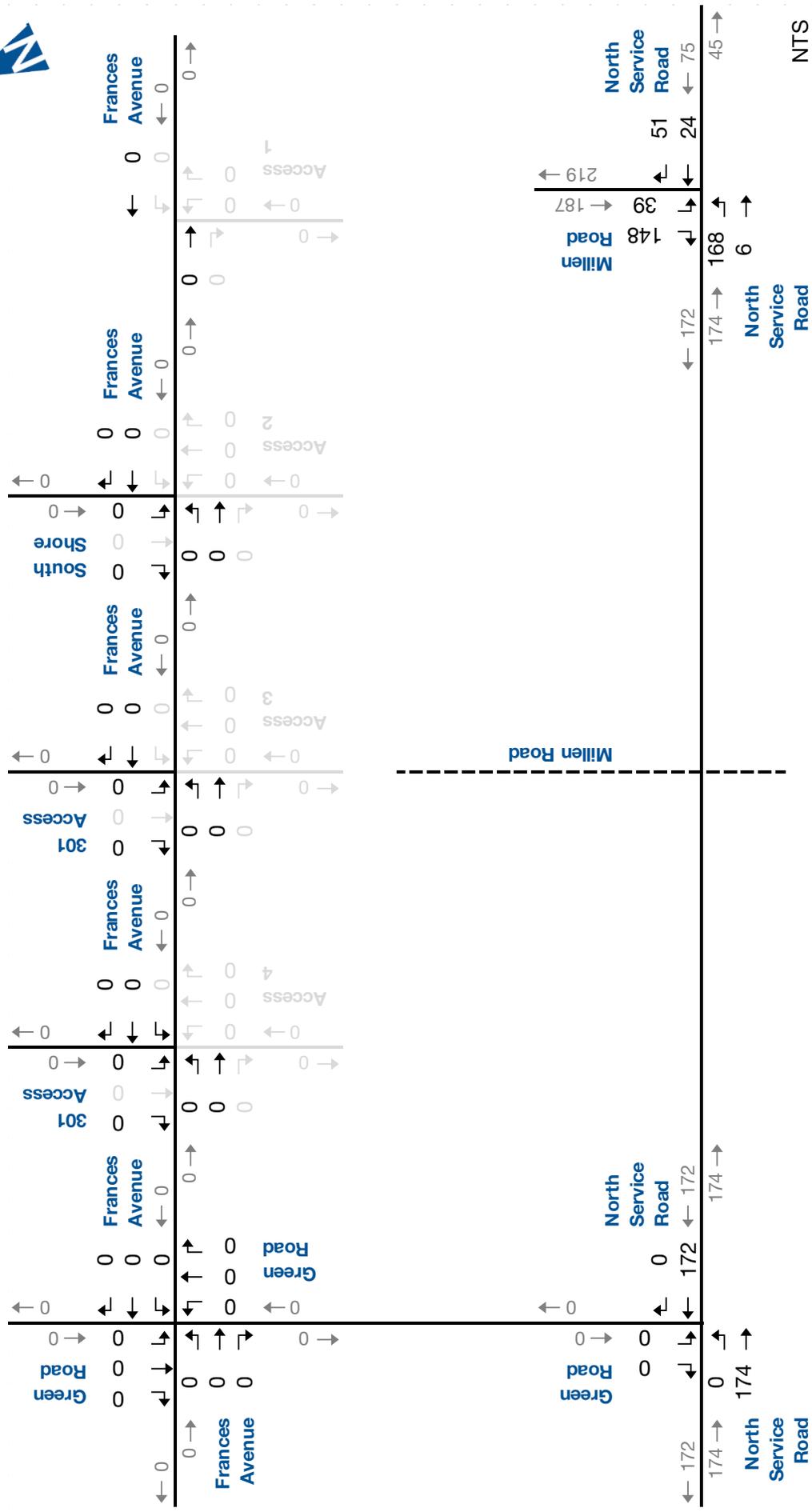


2021 AM Other Area Development Trip Assignment

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
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Figure 4.4

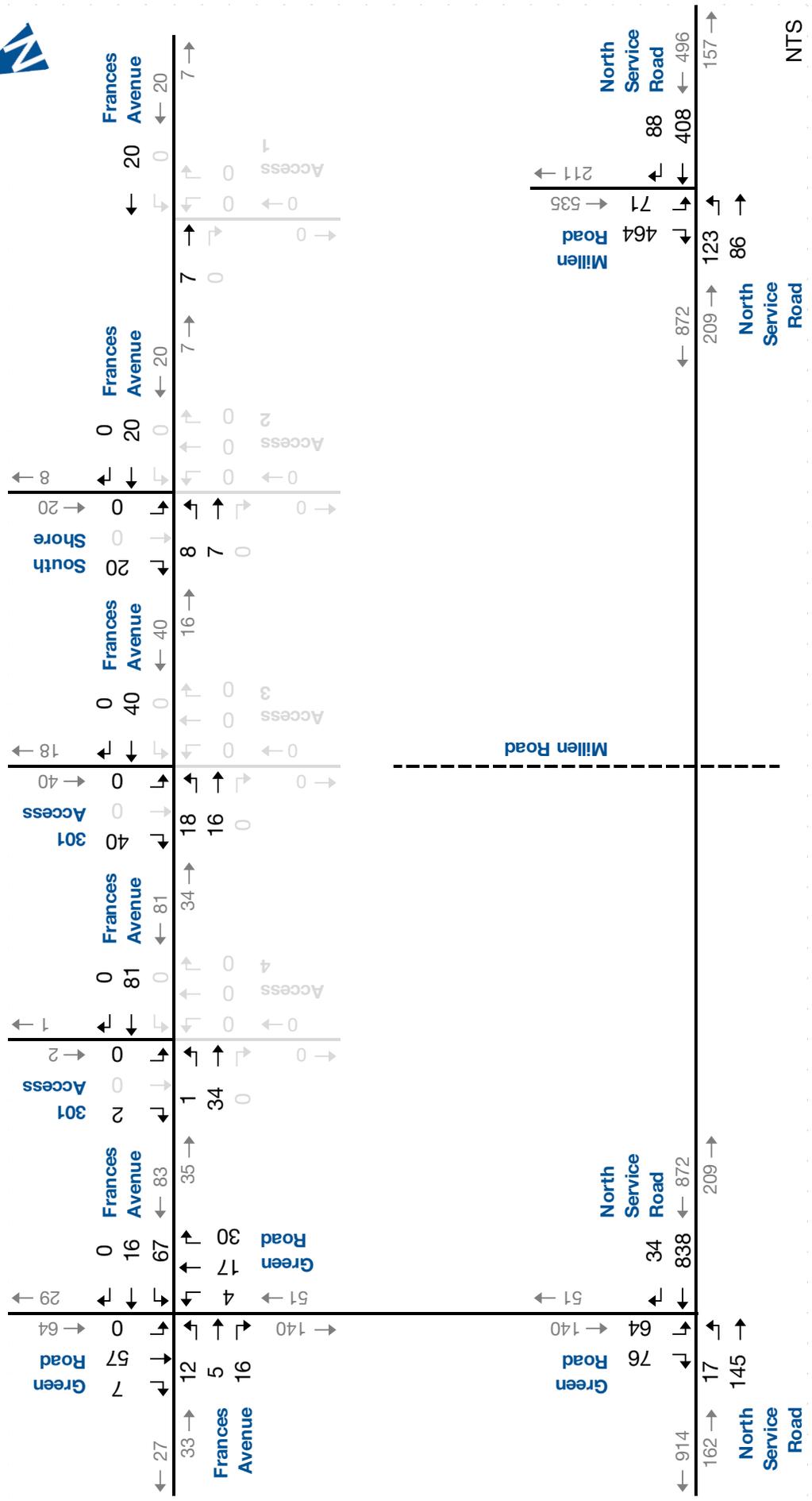
NTS



2021 PM Other Area Development Trip Assignment

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

Figure 4.5



2021 AM Total Background Traffic Forecasts

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

Figure 4.6

4.1.3 2021 Background Traffic Operations

The operations of the study area intersections under 2021 background traffic volumes were analyzed using Synchro 9 with HCM 2000 procedures.

The 101 Shoreview Place TIS identified remedial measures required in the study area to accommodate background traffic at 2021 and 2026 including:

- ▶ Traffic signals at the intersection of North Service Road and Millen Road; and
- ▶ Reconfiguring the southbound lanes at North Service Road and Millen Road to have the southbound right-turn as the main approach and the southbound left-turn as the added approach with 50 metres of storage.

These recommended improvements were assumed to be in place at the 2021 horizon and are reflected in all successive analyses.

Table 4.1 and **Table 4.2** summarize the 2021 background traffic operations for the AM and PM peak hours, respectively. The analyses indicate all intersections and movements within the study area are forecast to operate at overall acceptable levels of service. The following exception is noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS D with a v/c of 0.32 during the AM peak hour and LOS F with a v/c of 0.57 during the PM peak hour. The low to moderate v/c ratios indicate the delay is due to the high volume of through traffic on North Service which limits available gaps for side street traffic.

Appendix D contains the detailed supporting Synchro 9 reports.

TABLE 4.1: 2021 AM BACKGROUND TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 9 0.04 1	> > >	A 9	< < <	A 10 0.11 3	> > >	A 10	< < <	A 1 0.00 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	A 5	
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 10 0.03 1 125 124	A 0 0.09 0 -	> > >	A 1	< < <	A 0 0.56 0 -	> > >	A 0					D 29 0.32 10 40 30	< < <	C 20 0.25 8 -	> > >	C 24	A 3
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 11 0.36 25 90 65	A 7 0.09 14 -	> > >	A 9	< < <	B 11 0.54 78 -	> > >	B 11					B 18 0.20 14 50 36	< < <	C 26 0.71 48 -	> > >	C 25	B 17 0.60

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 4.2: 2021 PM BACKGROUND TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 10 0.06 2	> > >	A 10	< < <	B 10 0.06 2	> > >	B 10	< < <	A 1 0.01 0	> > >	A 1	< < <	A 1 0.00 0	> > >	A 1	A 4	
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	A 9 0.10 3 125 122	A 0 0.57 0 -	> > >	A 1	< < <	A 0 0.32 0 -	> > >	A 0					F 87 0.57 21 40 19	< < <	B 12 0.08 2 -	> > >	F 52	A 4
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 10 0.40 33 90 57	B 15 0.73 114 -	> > >	B 14	< < <	A 8 0.25 26 -	> > >	A 8					C 22 0.21 22 50 28	< < <	C 22 0.22 19 -	> > >	C 22	B 15 0.57

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

4.1.4 2021 Future Total Traffic Volumes

Figure 4.8 and **Figure 4.9** illustrates the forecast 2021 total traffic (background + Phase 1) volumes, for the AM and PM peak hours, respectively.

4.1.5 2021 Future Total Traffic Operations

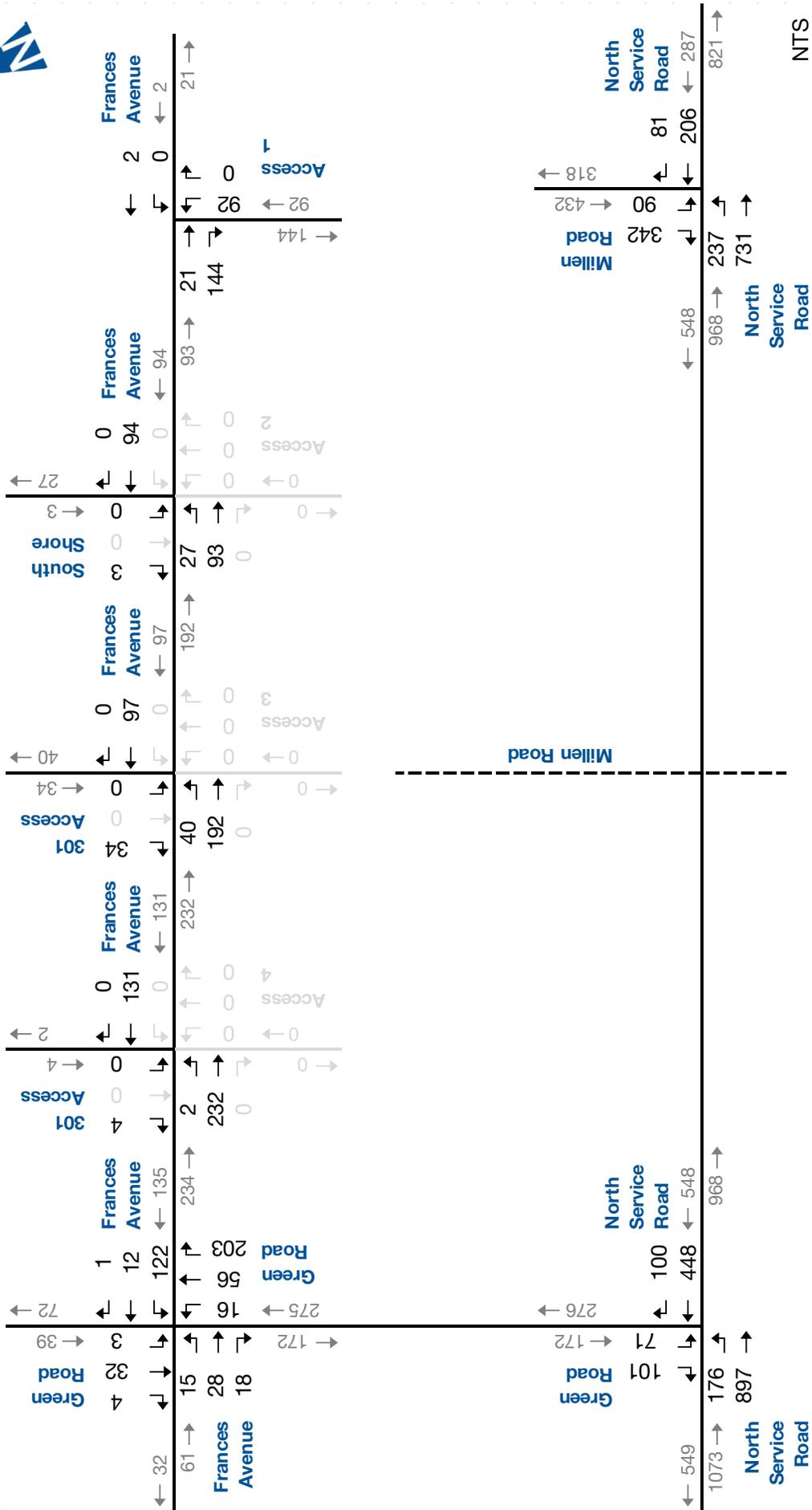
The operations of the study area intersection under 2021 total traffic volumes were analyzed using Synchro 9 with HCM 2000 procedures. Access 1 to the site will be constructed at this horizon.

Table 4.3 and **Table 4.4** summarize the 2021 future total traffic operations for the AM and PM peak hours, respectively. Based on the analyses, it is concluded that the intersections are forecast to operate similar to the background conditions. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS E with a v/c ratio of 0.58 during the AM peak hour and LOS F with a v/c ratio of 1.25 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 11 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.59 during the AM peak hour; and
 - The moderate v/c ratios during the AM peak hour indicate the delay to the above-noted movements is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

The addition of the site generated traffic will increase the delay at the study area intersections by 10 seconds or less during the AM and PM peak hours, in comparison to the background traffic operations. Of note, Site Access 1 on Frances Avenue is assumed to operate under stop sign control and is forecast to operate with acceptable levels of service during both peak hours.

Appendix E provides the detailed supporting Synchro reports.



2021 PM Total Traffic Forecasts

Figure 4.9

TABLE 4.3: 2021 AM TOTAL TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 10 0.05	> > >	A 10	< < <	B 12 0.33	> > >	B 12	< < <	A 0 0	> > >	A 0	< < <	A 0 0	> > >	A 0	A 7
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 11 0.07 2	A 0 0.09 0	> > >	A 2	< < <	A 0 0.57 -	> > >	A 0					E 46 0.58 25	> > >	D 31 0.59 28	E 37	A 8
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	C 24 0.60 37	B 11 0.16 17	> > >	B 18	< < <	B 19 0.69 80	> > >	B 19					B 13 0.14 14	> > >	B 19 0.58 51	B 19	B 19 0.64
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.04	> > >	A 0	< < <	A 0 0.00	> > >	A 0	A 10 0.17	> > >	A 10					A 6	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 4.4: 2021 PM TOTAL TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	B 11 0.10	> > >	B 11	< < <	B 13 0.24	> > >	B 13	< < <	A 1 0	> > >	A 1	< < <	A 1 0.00	> > >	A 1	A 5
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	A 10 0.19 6	A 0 0.57 0	> > >	A 2	< < <	A 0 0.35 -	> > >	A 0					F 311 1.25 51	> > >	B 13 0.20 6	F 136	B 14
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 11 0.42 34	B 16 0.75 119	> > >	B 15	< < <	A 8 0.29 30	> > >	A 8					C 22 0.21 22	> > >	C 22 0.24 19	C 22	B 15 0.59
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.11	> > >	A 0	< < <	A 0 0.00	> > >	A 0	A 10 0.11	> > >	A 10					A 3	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

4.2 2023 Horizon

4.2.1 General Background Traffic Growth

To derive the 2023 general background traffic volumes, a compound growth rate of 2 percent per annum was applied to the existing traffic volumes (10.4 percent total growth).

Figure 4.10 and **Figure 4.11** illustrate the 2023 background traffic forecasts for the AM and PM peak hours, respectively and include:

- ▶ General background traffic growth;
- ▶ Traffic from the area developments, as already noted; and
- ▶ the Phase 1 site traffic.

4.2.2 2023 Background Traffic Operations

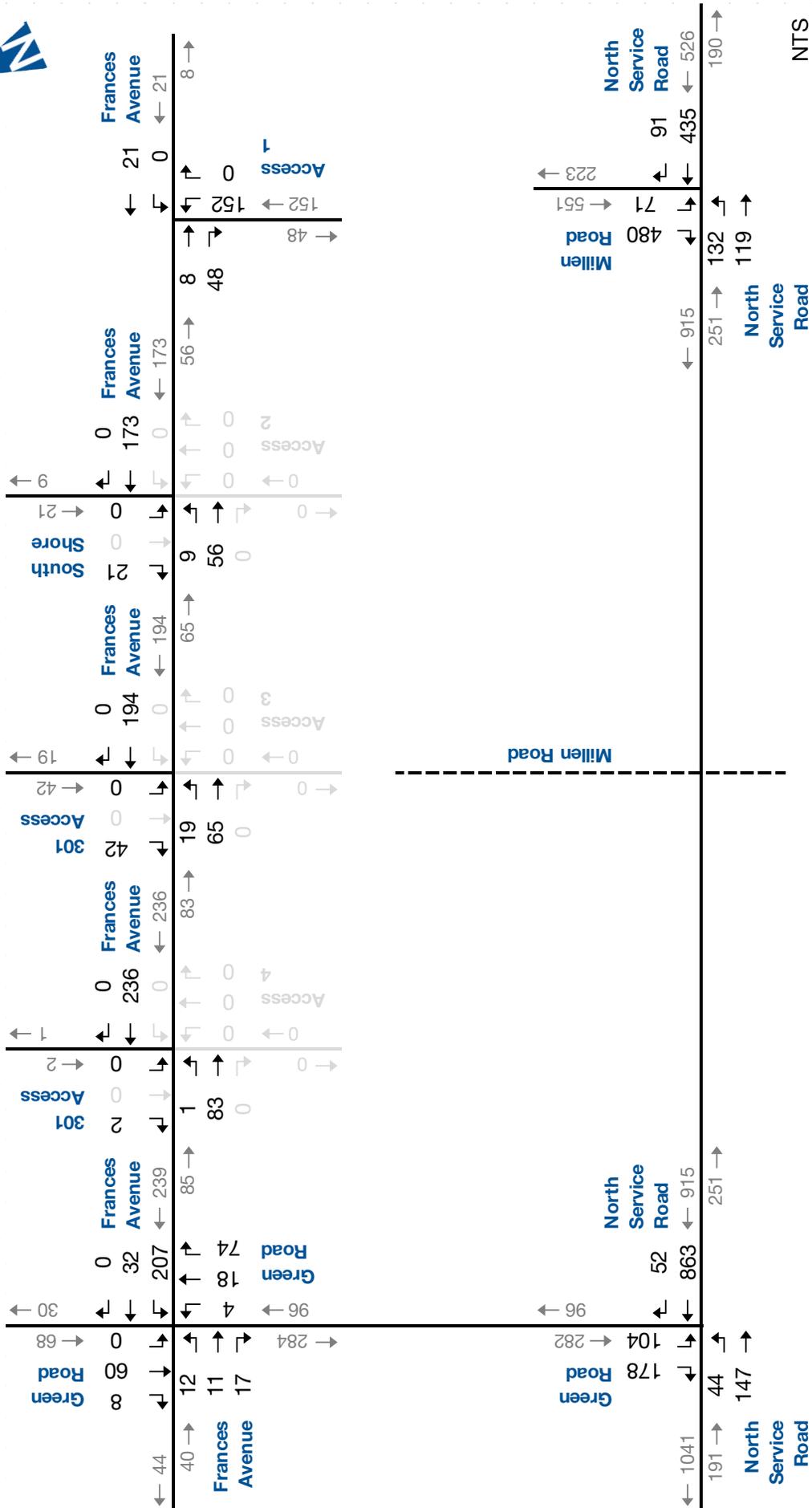
The operations of the study area intersections under 2023 background traffic volumes were analyzed using Synchro 9 with HCM 2000 procedures.

Table 4.5 and **Table 4.6** summarize the 2023 background traffic operations for the AM and PM peak hours, respectively.

The analyses indicate that all intersections and movements within the study area are forecast to operate at acceptable levels of service under 2023 background traffic volumes. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 0.62 during the AM peak hour and LOS F with a v/c ratio of 1.40 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 16 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.62 during the AM peak hour; and
 - The moderate v/c ratios during the AM peak hour indicate the delay to the above-noted movements is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

Appendix F contains the detailed supporting Synchro 9 reports.



2023 AM Background Traffic Forecasts

Waterfront Trails Transportation Impact, Parking Justification and TDM Options Study
 180010

Figure 4.10

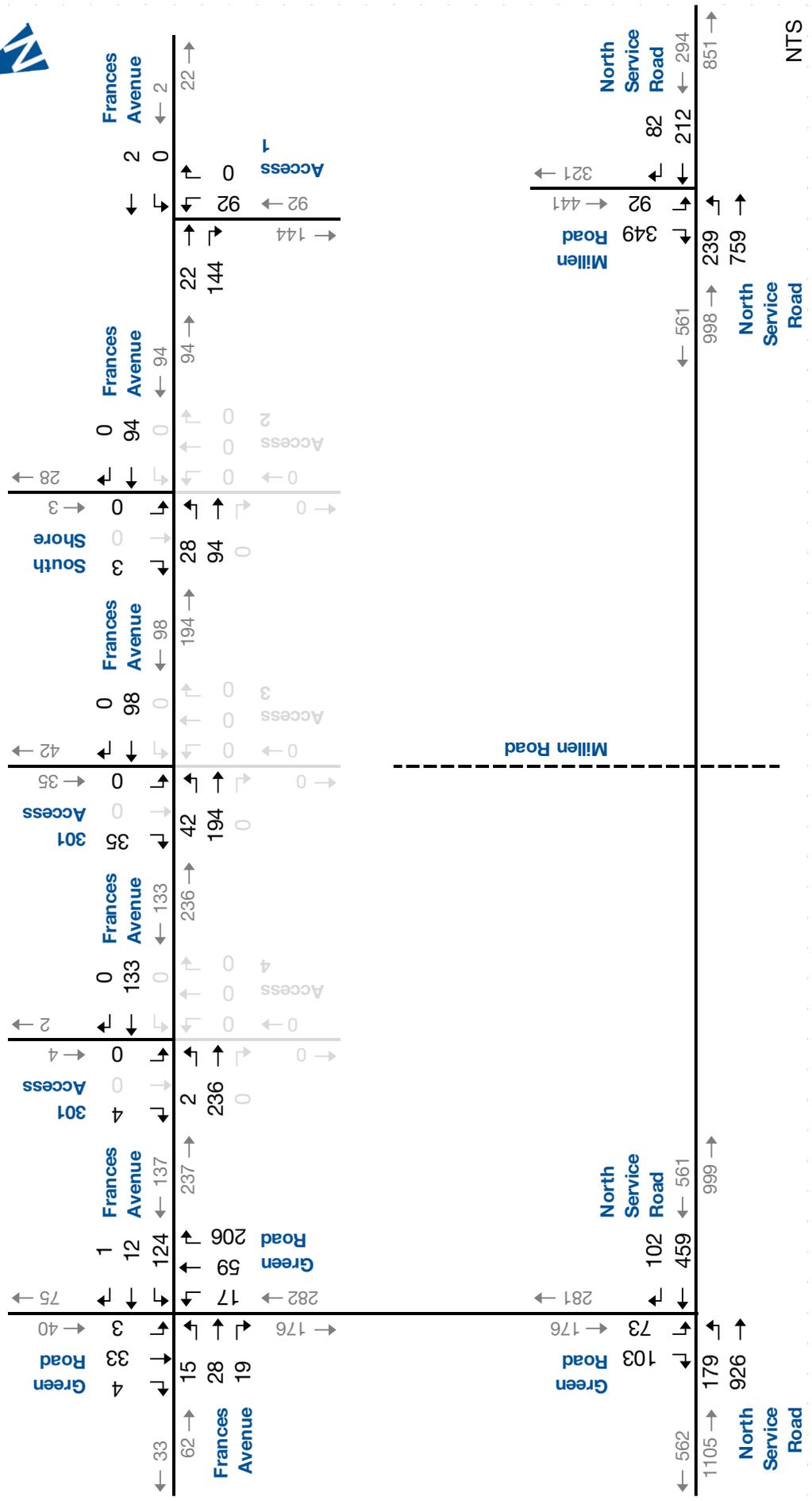


TABLE 4.5: 2023 AM BACKGROUND TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 10 0.05	> > >	A 10	< < <	B 12 0.34	> > >	B 12	< < <	A 0 0.00	> > >	A 0	< < <	A 0 0.00	> > >	A 0	A 7
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 11 0.07 2 125 123	A 0 0.09 0 -	> > > >	A 3	< < <	A 0 0.59 -	> > > >	A 0					F 52 0.62 28 40 12	> > > >	D 34 0.62 31 -	E 40	A 9
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	C 28 0.66 39 90 51	B 11 0.16 18 -	> > > >	B 20	< < <	B 20 0.72 84 -	> > > >	B 20					B 13 0.14 14 50 36	> > > >	C 20 0.61 56 -	B 19	B 20 0.67
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.04 0	> > > >	A 0	< < <	A 0 0.00 0	> > > >	A 0	A 10 0.17 5	> > > >	A 10					A 6	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 4.6: 2023 PM BACKGROUND TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	B 11 0.10	> > >	B 11	< < <	B 13 0.24	> > >	B 13	< < <	A 1 0.01	> > >	A 1	< < <	A 1 0.00	> > >	A 1	A 5
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	A 10 0.20 6 125 119	A 0 0.59 0 -	> > > >	A 2	< < <	A 0 0.36 0 -	> > > >	A 0					F 377 1.40 56 40 -16	> > > >	B 14 0.21 6 -	F 164	C 17
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 11 0.43 35 90 55	B 17 0.78 128 -	> > > >	B 16	< < <	A 9 0.29 31 -	> > > >	A 9					C 22 0.22 23 50 28	> > > >	C 22 0.24 19 -	C 22	B 16 0.61
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.11 0	> > > >	A 0	< < <	A 0 0.00 0	> > > >	A 0	A 10 0.11 3	> > > >	A 10					A 3	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

4.2.3 2023 Future Total Traffic Volumes

Figure 4.12 and **Figure 4.13** illustrate the forecast 2023 total traffic (2023 background + Phase 2) volumes, for the AM and PM peak hours, respectively.

4.2.4 2023 Future Total Traffic Operations

The operations of the study area intersections under 2023 total traffic volumes were analyzed using Synchro 9 with HCM 2000 procedures. In addition to Access 1, Accesses 2 and 3 to the site will be constructed at this horizon.

Table 4.7 and **Table 4.8** summarize the 2023 total traffic operations for the AM and PM peak hours, respectively. Based on the analyses, it is concluded that the intersections are forecast to operate similar to the 2023 background conditions. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 0.93 during the AM peak hour and LOS F with a v/c ratio of 2.66 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 15 metres during the AM peak hour and 51 metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 0.95 during the AM peak hour; and
 - Overall intersection – LOS E during the PM peak hour.

With the exception of the North Service Road and Green Road intersection, the addition of the site generated traffic will increase the delay at the study area intersections by 3 seconds or less during the AM and PM peak hours, in comparison to the background traffic operations. Of note, Site Access 1, 2 and 3 on Frances Avenue are assumed to operate under stop sign control and are forecast to operate with acceptable levels of service during both peak hours.

Appendix G provides the detailed supporting Synchro reports.

TABLE 4.7: 2023 AM TOTAL TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 10 0.06 2	> > >	A 10	< < <	C 16 0.56 28	> > >	C 16	< < <	A 0 0.00 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10	
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 11 0.11 3 125 122	A 0 0.09 0 - -	> > >	A 4	< < <	A 0 0.60 0 - -	> > >	A 0					F 111 0.93 55 40 -15	> > >	F 78 0.95 77 -	> > >	F 89	C 24
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.72 43 90 47	B 11 0.20 21 - -	> > >	C 22	< < <	C 20 0.73 88 - -	> > >	C 20					B 13 0.14 14 50 36	> > >	C 21 0.63 59 -	> > >	B 20	C 20 0.68
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.04 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10 0.17 5	> > >	A 10					A 6		
	5 - Frances Avenue & Access 2	TWSC	LOS Delay V/C Q	< < <	A 1 0.01 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 12 0.12 3	> > >	B 12	< < <	A 9 0.03 1	> > >	A 9	A 3	
	6 - Frances Avenue & Access 3	TWSC	LOS Delay V/C Q	< < <	A 1 0.02 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 14 0.17 5	> > >	B 14	< < <	B 10 0.06 2	> > >	B 10	A 3	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 4.8: 2023 PM TOTAL TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	B 12 0.14 4	> > >	B 12	< < <	C 17 0.45 19	> > >	C 17	< < <	A 0 0.01 0	> > >	A 0	< < <	A 1 0.00 0	> > >	A 1	A 7
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 10 0.29 10 125 115	A 0 0.59 0 - -	> > >	A 2	< < <	A 0 0.39 0 - -	> > >	A 0					F 976 2.66 91 40 -51	< < <	C 15 0.33 12 -	F 373	E 47
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 11 0.46 37 90 53	B 18 0.79 134 - -	> > >	B 16	< < <	A 9 0.33 35 - -	> > >	A 9					C 22 0.22 23 50 28	< < <	C 22 0.25 20 -	C 22	B 16 0.62
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.11 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10 0.11 3	< < <	> > >	A 10					A 3
	5 - Frances Avenue & Access 2	TWSC	LOS Delay V/C Q	< < <	A 1 0.02 1	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 11 0.07 2	> > >	B 11	< < <	A 9 0.00 0	> > >	A 9	A 2
	6 - Frances Avenue & Access 3	TWSC	LOS Delay V/C Q	< < <	A 1 0.03 1	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	C 16 0.12 3	> > >	C 16	< < <	A 9 0.04 1	> > >	A 9	A 2

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

4.3 2025 Horizon

4.3.1 General Background Traffic Growth

To derive the 2025 general background traffic volumes, a compound growth rate of 2 percent per annum was applied to the existing traffic volumes (14.9 percent total growth).

Figure 4.14 and **Figure 4.15** show the 2025 total background traffic forecasts for the AM and PM peak hours, respectively and include:

- ▶ General background traffic growth;
- ▶ Traffic from area developments, as already noted; and
- ▶ The Phase 1 and Phase 2 site traffic.

4.3.2 2025 Background Traffic Operations

The operations of the study area intersections under 2025 background traffic volumes were analyzed using Synchro 9 with HCM 2000 procedures.

Table 4.9 and **Table 4.10** summarize the 2025 background traffic operations for the AM and PM peak hours, respectively.

The analyses indicate that all intersections and movements within the study area are forecast to operate at acceptable levels of service under 2025 background traffic volumes. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 1.0 during the AM peak hour and LOS F with a v/c ratio of 2.97 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 21 metres during the AM peak hour and 55 metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 1.01 during the AM peak hour; and
 - Overall intersection – LOS D during the AM peak hour and LOS F during the PM peak hour.

Appendix H contains the detailed supporting Synchro 9 reports.

TABLE 4.9: 2025 AM BACKGROUND TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	A 10 0.06 2	> > >	A 10	< < <	C 16 0.56 29	> > >	C 16	< < <	A 0 0.00 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10	
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 11 0.11 3 125 122	A 0 0.10 0 - -	> > >	A 4	< < <	A 0 0.61 - -	> > >	A 0					F 130 1.00 61 40 -21	> > >	F 93 1.01 86 -	> > >	F 106	D 28
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	D 40 0.78 45 90 45	B 11 0.21 22 - -	> > >	C 25	< < <	C 21 0.75 105 - -	> > >	C 21					B 13 0.14 14 50 36	> > >	C 22 0.67 68 -	> > >	C 21	C 22 0.72
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.04 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10 0.17 5	> > >	A 10					A 6		
	5 - Frances Avenue & Access 2	TWSC	LOS Delay V/C Q	< < <	A 1 0.01 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 12 0.12 3	> > >	B 12	< < <	A 9 0.03 1	> > >	A 9	A 3	
	6 - Frances Avenue & Access 3	TWSC	LOS Delay V/C Q	< < <	A 1 0.02 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 15 0.17 5	> > >	B 15	< < <	B 10 0.06 2	> > >	B 10	A 3	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 4.10: 2025 PM BACKGROUND TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	B 13 0.15 4	> > >	B 13	< < <	C 18 0.47 20	> > >	C 18	< < <	A 0 0.01 0	> > >	A 0	< < <	A 1 0.00 0	> > >	A 1	A 7	
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 11 0.30 10 125 115	A 0 0.61 0 - -	> > >	A 2	< < <	A 0 0.40 0 - -	> > >	A 0					F 1130 2.97 95 40 -55	< < <	C 16 0.34 12 -	F 432	F 54	
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 12 0.47 38 90 52	B 19 0.82 168 -	> > >	B 18	< < <	A 9 0.33 36 -	> > >	A 9					C 22 0.22 23 50 27	< < <	C 22 0.26 20 -	C 22	B 17 0.65	
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.11 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10 0.11 3	< < <	B 11 0.07 2	> > >	B 11	< < <	A 9 0.00 0	> > >	A 9	A 3
	5 - Frances Avenue & Access 2	TWSC	LOS Delay V/C Q	< < <	A 1 0.02 1	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 11 0.07 2	> > >	B 11	< < <	A 9 0.00 0	> > >	A 9	A 2	
	6 - Frances Avenue & Access 3	TWSC	LOS Delay V/C Q	< < <	A 1 0.03 1	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	C 16 0.12 3	> > >	C 16	< < <	A 9 0.04 1	> > >	A 9	A 2	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

4.3.3 2025 Future Total Traffic Volumes

Figure 4.16 and **Figure 4.17** illustrate the forecast 2025 total traffic (background + Phase 3) volumes, for the AM and PM peak hours, respectively.

4.3.4 2025 Future Total Traffic Operations

The operations of the study area intersections under 2025 total traffic volumes were analyzed using Synchro 9 with HCM 2000 procedures. All Accesses to the site will be constructed at this horizon.

Table 4.11 and **Table 4.12** summarize the forecast operational results for the AM and PM peak hours, respectively. Based on the analyses, it is concluded that the intersections are forecast to operate similar to the background conditions. The following critical movements are noted:

- ▶ Green Road and Frances Avenue:
 - Westbound left-turn/through/right-turn movement – LOS D with a v/c ratio of 0.79 during the AM and 0.74 during the PM peak hour.
- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 1.40 during the AM peak hour and a v/c ratio of 5.47 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 59 metres during the AM peak hour and 55+ metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 1.33 during the AM peak hour; and
 - Overall intersection – LOS F during the AM and PM peak hours.

With the exception of the North Service Road and Green Road intersection, the addition of the site generated traffic will increase the delay at the study area intersections by 7 seconds or less during the AM and PM peak hours, in comparison to the background traffic operations. Of note, Site Access 1, 2, 3 and 4 on Frances Avenue are assumed to operate under stop sign control and are forecast to operate with acceptable levels of service during both peak hours.

Appendix I provides the detailed supporting Synchro reports.

TABLE 4.11: 2025 AM TOTAL TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	B 10 0.07 2	> > >	B 10	< < <	D 26 0.79 62	> > >	D 26	< < <	A 0 0.00 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	C 17	
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 12 0.16 4 125 121	A 0 0.10 0 - -	> > >	A 5	< < <	A 0 0.62 0 - -	> > >	A 0					F 278 1.40 99 40 -59	> > >	F 204 1.33 156 - -	> > >	F 228 -	F 70
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	D 49 0.84 48 90 42	B 12 0.24 25 - -	> > >	C 29	< < <	C 21 0.77 107 - -	> > >	C 21					B 13 0.14 14 50 36	> > >	C 23 0.69 79 - -	> > >	C 21	C 23 0.77
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.04 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10 0.17 5	> > >	A 10					A 6		
	5 - Frances Avenue & Access 2	TWSC	LOS Delay V/C Q	< < <	A 1 0.01 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 12 0.12 3	> > >	B 12	< < <	A 9 0.03 1	> > >	A 9	A 3	
	6 - Frances Avenue & Access 3	TWSC	LOS Delay V/C Q	< < <	A 1 0.02 0	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	C 17 0.33 11	> > >	C 17	< < <	B 10 0.06 2	> > >	B 10	A 5	
	7 - Frances Avenue & Access 4	TWSC	LOS Delay V/C Q	< < <	A 0 0.00 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	< < <	C 17 0.19 5	> > >	C 17	< < <	B 11 0.00 0	> > >	B 11	A 2	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 4.12: 2025 PM TOTAL TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay V/C Q	< < <	B 15 0.21 6	> > >	B 15	< < <	D 32 0.74 48	> > >	D 32	< < <	A 0 0.01 0	> > >	A 0	< < <	A 1 0.00 0	> > >	A 1	B 12
	2 - North Service Road & Green Road	TWSC	LOS Delay V/C Q Ex Avail.	B 12 0.40 16 125 110	A 0 0.61 0 - -	> > >	A 3	< < <	A 0 0.43 0 - -	> > >	A 0					F Err 5.47 Err 40 ####	C 19 0.48 20 -	F 3530	F 516	
	3 - North Service Road & Millen Road	TCS	LOS Delay V/C Q Ex Avail.	B 12 0.50 40 90 50	C 20 0.84 173 - -	> > >	B 19	< < <	A 9 0.36 40 - -	> > >	A 9					C 22 0.22 23 50 27	C 22	C 22	B 18 0.66	
	4 - Frances Avenue & Access 1	TWSC	LOS Delay V/C Q	< < <	A 0 0.11 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	A 10 0.11 3	> > >	A 10					A 3	
	5 - Frances Avenue & Access 2	TWSC	LOS Delay V/C Q	< < <	A 1 0.02 1	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	B 11 0.07 2	> > >	B 11	< < <	A 9 0.00 0	> > >	A 9	A 2
	6 - Frances Avenue & Access 3	TWSC	LOS Delay V/C Q	< < <	A 1 0.03 1	> > >	A 1	< < <	A 0 0.00 0	> > >	A 0	< < <	C 18 0.25 8	> > >	C 18	< < <	A 9 0.04 1	> > >	A 9	A 3
	7 - Frances Avenue & Access 4	TWSC	LOS Delay V/C Q	< < <	A 0 0.32 0	> > >	A 0	< < <	A 0 0.00 0	> > >	A 0	< < <	C 17 0.13 4	> > >	C 17	< < <	A 0 0.00 0	> > >	A 0	A 1

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

5 Remedial Measures

The following section reviews the need for measures that should potentially be implemented to mitigate the impacts of increased in traffic on the study network.

5.1 Traffic Control Signal

The southbound left-turn and right-turn movements at intersection of North Service Road and Green Road are forecast to operate at LOS F and LOS D, respectively by 2021 with the additional development traffic.

Using Justification 7 under Ontario Traffic Manual (OTM) Book 12¹⁰ procedures, the intersection of North Service Road and Green Road satisfies the necessary conditions to implement traffic control signals by 2025 under total traffic conditions. The signal warrant is fulfilled 145%, which exceeds the fulfillment requirement of 120% for existing intersections and accounts for increased uncertainty of volume projections for proposed new developments. Under 2023 total traffic conditions, the warrant is fulfilled 117%, which almost meets the requirement for the installation of traffic signals. Under 2021 total traffic conditions, the warrant is only fulfilled 87%, which does not meet the requirements set out in Book 12.

However, to provide acceptable levels of service for the southbound movements at the intersection of Green Road and North Service Road, it is recommended traffic signals are installed at the 2021 horizon year. Upon full build-out of the site in 2025, traffic signals are forecast to be warranted at the intersection. The provision of signals will not only help to improve delays on the southbound approach but will also improve safety within the area by providing a protected phase for traffic on Green Road. This removes the potential for motorists frustration and unsafe turning movements from Green Road when gaps are not available.

Appendix J includes the signal warrant justification worksheets.

5.2 Right-Turn Lane Warrant

At the intersection of North Service Road and Green Road, the westbound through/right-turn movement is forecast to approach capacity at the 2021 horizon. This is likely caused by the general increase in through traffic coupled with the increase in right-turning traffic due to the proposed development.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roadways¹¹ (GDGCR) details the requirements for auxiliary right-

¹⁰ Ministry of Transportation Ontario. *Ontario Traffic Manual Book 12 – Traffic Signals*. March 2012.

¹¹ Transportation Association of Canada. *Geometric Design Guide for Canadian Roads*. 2017.

turn lanes. The GDGCR recommends a right-turn lane at a signalized intersection without a separate signal indication “when the volume of right-turning traffic is 10% to 20% of the total approaching volume”. The right-turning volume accounts for 6% and 18% of the total advancing volume during the AM and PM peak hours respectively. Of the right-turning traffic, 33% and 50% is site-generated during the AM and PM peak hours respectively, at the 2021 horizon. By 2025, the right-turning volume accounts for 9% and 30% of the total advancing volume during the AM and PM peak hours respectively. Of the right-turning traffic, 56% and 72% is site-generated during the AM and PM peak hours respectively.

Based on the TAC GDGCR, a westbound right-turn lane should be provided on North Service Road at Green Road at the 2025 horizon. Based on an 80 kilometre per hour design speed, a total lane length of 127.5 metres is required as follows:

- ▶ A minimum of 60 metres of taper (based on a 3.5 metre lane width);
- ▶ A minimum of 60 metres of parallel lane; and
- ▶ 7.5 metres of storage.

There is an open channelized river on the north side of North Service Road, approximately 60 metres east of Green Road. The location of the river limits the available space to construct a westbound right-turn lane without undertaking major road widening. At this location, a short right-turn lane and taper may be a feasible solution to fit within the existing roadway constraints. **Appendix K** provides a preliminary design for the right-turn lane, indicating a 10-metre lane and 15.8 metre taper can be accommodated west of the culvert. The right-turn lane is sub-standard compared to TAC requirements, however it allows for speed reduction outside of the through lane on North Service Road.

5.3 Left-Turn Lanes

The westbound shared left-turn/through/right-turn movement at intersection of Green Road and Frances Avenue is forecast to operate at LOS D during the AM and PM peak hour at the 2025 horizon, with the addition of the development traffic. An all-way Stop is not recommended for the intersection as it may result in northbound traffic backing up into the intersection of Green Road and North Service Road.

The majority (about 90 percent) of westbound traffic at the intersection completes a westbound to southbound left-turn from Frances Avenue onto Green Road. Provision of a separate left-turn lane will help to improve operations on the westbound approach since it will separate left-turns from the through and right-turning traffic. Based on the analyses in the following section, 45 metres of storage should be provided. The cross-section of Frances Avenue is wide enough to accommodate both a left-turn lane and shared through right-turn lane through pavement markings only and without

the need for road widening. Therefore, it is recommended that separate lanes are provided on this approach.

5.4 Traffic Operations

Paradigm completed Synchro 9 level of service analyses with HCM 2000 procedures for the intersections with the proposed improvements:

- ▶ Traffic signals at North Service Road and Green Road;
- ▶ A separate westbound left-turn lane at Green Road and Frances Road; and
- ▶ A separate westbound right-turn lane at North Service Road and Green Road.

The intersections were assessed for the 2025 future total traffic horizon, as this represents the “worst case scenario”. If the intersection improvements provide acceptable levels of service for all movements at this horizon, they will provide acceptable levels of service for the 2021 and 2023 horizons.

Table 5.1 and **Table 5.2** summarize the total traffic operations for the AM and PM peak hours, respectively. Based on the analyses, it is concluded that the intersections are forecast to operate at acceptable levels of service. The following exceptions are noted:

- ▶ Green Road and Frances Avenue:
 - Westbound left-turn movement – LOS D with a v/c ratio of 0.68 during the PM peak hour. The 95th percentile queue indicates 45 metres of storage is required.
- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – 95th percentile queue is forecast to exceed the available storage by 15 metres during the AM peak hour; and
 - Southbound right-turn movement – 95th percentile queue is forecast to extend back and may block the commercial plaza driveway during the AM peak hour. This will occur for approximately 5% of the peak hour or for about three minutes.

The 50th percentile queue estimate is 47 metres which will not extend beyond the driveway. The 50th percentile queue is a better representation of the actual level of queueing as it will occur for about half of the peak hour.

As well, commercial developments typically have very low AM peak hour traffic volumes; therefore, if the queue does extend back to block this driveway, the overall impacts may be negligible.

Appendix L includes the detailed Synchro reports.

TABLE 5.1: 2025 AM REMEDIAL MEASURES TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay	<	B 10	>	B 10	C 21	B 11	>	C 20	<	A 0	>	A 0	<	A 0	>	A 0	B 13
			V/C	<	0.07	>		0.69	0.09	>		<	0.00	>		<	0.00	>		
			Q	<	2	>		45	2	>		<	0	>		<	0	>		
	2 - North Service Road & Green Road	TCS	LOS Delay	C 30	A 8		B 16		C 20	A 7		B 19								
			V/C	0.64	0.15				0.83	0.07										
			Q	43	20				205	6										
			Ex Avail.	125	-				-	60										
				82					54											

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

TABLE 5.2: 2025 PM REMEDIAL MEASURES TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Green Road & Frances Avenue	TWSC	LOS Delay	<	B 15	>	B 15	D 28	B 12	>	D 27	<	A 0	>	A 0	<	A 1	>	A 1	A 10
			V/C	<	0.21	>		0.68	0.06	>		<	0.01	>		<	0.00	>		
			Q	<	6	>		40	2	>		<	0	>		<	0	>		
	2 - North Service Road & Green Road	TCS	LOS Delay	B 15	B 18		B 17		A 8	A 6		A 8								
			V/C	0.65	0.83				0.43	0.13										
			Q	68	193				58	7										
			Ex Avail.	125	-				-	60										
				57					53											

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-Turn Lane
 > - Shared Right-Turn Lane

6 Parking Assessment

In any equilibrium system, there are a minimum of two components that are required to reach the equilibrium point. With parking systems, this is the balance of parking supply and demand. Reaching an appropriate supply level is equally important as demand. The ubiquitous oversupply of cheap and easily accessible parking has long been identified as a major contributing factor to the growth in single-occupant vehicle (SOV) travel.

The anticipated parking demand for the proposed development was estimated to determine if a reduction from the generic parking requirements set-out in the City of Stoney Creek’s Zoning By-law 3692-92 could be justified. Two (2) approaches were considered, with the findings for each documented below.

6.1 By-law Parking Requirements

The Stoney Creek Zoning By-law requires a total of 1.60 parking spaces per one-bedroom apartment unit (1.25 spaces per unit for residents and 0.35 spaces per unit for visitors) and a total of 1.85 parking spaces per two-bedroom unit (1.50 spaces per unit for residents and 0.35 spaces per unit for visitors). Under this By-law, a total of 3,090 parking spaces will be required to service the residential component of the site. The site is proposing 2,438 spaces which is a deficiency of 652 spaces, or about 21 percent of parking required under the By-law as shown in **Table 6.1**.

TABLE 6.1: ZONING BY-LAW PARKING REQUIREMENTS

Number of Bedrooms	Number of Units	By-Law Parking Requirements			Required Spaces
		Residents	Visitors	Total	
1	1227	1.25	0.35	1.60	1,963
2	609	1.50	0.35	1.85	1,127
Total By-Law Parking Requirements					3,090
Proposed Number of Spaces					2,438
Stall Deficiency					652
Percent Deficiency					21%

6.2 Proxy Site Parking Demand Surveys

Another approach to estimate the parking demands of the proposed site is the use of local parking surveys. Ultimately, a similar site within the City of Hamilton would be used as the proxy site for collection of parking and trip generation data to determine the area-specific parking demands. However, a similar site where parking could be easily accessed was not found within City limits. In lieu of this, parking and trip generation surveys were

undertaken on four consecutive weekdays at a similar ‘proxy’ site in Burlington, Ontario. The site (3060/3070 Rotary Way) is located at the intersection of Dundas Street and Rotary Way. The site consists of 224 residential condominiums with a total parking supply of 432 spaces available for both residents and visitors. This amounts to a total parking supply of 1.93 spaces per residential unit. Although this proxy site is smaller than the proposed site, it is quite similar to the type of development proposed for the subject site and proximity to a major highway. As well, both the subject site and proxy site are in locations outside the city centre where reliance on automobile transportation tends to be higher.

The four-day parking demand data was summarized in 30-minute increments by day for both the AM and PM survey hours. A utilization rate was then produced for each half hour on each consecutive day, which was then summarized into a parking rate per unit for each 30-minute period.

Analyses of the proxy site data indicate that the peak parking rate was observed to be 1.25 spaces per unit during the AM survey period and 0.96 spaces per unit during the PM survey period inclusive of visitor parking demands. The average rates were 1.16 and 0.83 spaces per unit in the AM and PM peak hours respectively. In order to be conservative, the peak parking demand of 1.25 was chosen as the most representative parking demand rate for the proxy site. Note that this rate is between 0.35 and 0.60 spaces per unit lower than the current Zoning By-law requirements for the proposed site. The proxy site survey data is provided in **Appendix M**.

The peak proxy site rate of 1.25 spaces per unit (residents and visitors combined) was applied to the 1,836 proposed units at 310 Frances Avenue. This results in a parking requirement of 2,295 spaces, or an oversupply of 143 spaces (6 percent) as shown in **Table 6.2**.

TABLE 6.2: PARKING REQUIREMENTS BASED ON PROXY SITE DATA

Units	Proxy Site Parking Requirement	Required Spaces
1,836	1.25 spaces per dwelling unit	2,295
Proposed Number of Spaces		2,438
Stall Surplus		143
Percent Surplus		6%

6.3 Overall Parking Assessment

Based on the information contained within this section, it is anticipated that the site will have a deficiency in parking of 652 spaces based on the By-law parking requirements and a surplus of 143 spaces based on the proxy site data. The proxy site data provides an accurate representation of the parking

demands for the site as they are based on area-specific data and not a general Zoning By-law. Additionally, it further supports a reduction in parking requirements for the site. Therefore, the proposed parking supply should adequately accommodate the parking demands of the site.

In the event that the parking demands of the site exceed the available capacity during the higher demand evening and weekend periods, on-street parking is available on Frances Avenue adjacent to the site and on Green Road west of the site (**Figure 1.1**). While it is not intended that residents would utilize the on-street parking, it is not unreasonable to assume that visitors to the building may park on Frances Avenue or Green Road for a short duration.

At present, the City's On-street parking By-law permits parking for up to 12 hours at any give time on these roadways. Since adequate parking should be provided on-site and on-street parking will likely only be used by visitors, posting of parking restrictions on both roadways is not recommended as this will negatively impact the number of parking spaces available for the existing residential properties.

7 Transportation Demand Management

This section of the report has been prepared to meet the City of Hamilton's Transportation Demand Management for Development Guidelines¹². More specifically, section 3.A *Residential* of the guidelines. Although a small commercial component is proposed for the development, given the proposed size of 400 square metres and minor estimated trip generation, section 3.A provides a better representation of the requirements of the development.

Transportation Demand Management (TDM) refers to ways of making the capacity of our roads more efficient by reducing vehicle demand. TDM approaches consider how people's choices of travel mode are affected by factors such as land use patterns, development design, parking availability, parking cost, and the relative cost, convenience and availability of alternative modes of travel. TDM is one of the tools that municipalities are using to create more vibrant and sustainable communities. Using policies and programs to make active and sustainable transportation more convenient, a TDM approach to transportation can deliver long-term environmental sustainability, improve public health, create stronger communities, and build more prosperous and livable cities. Various TDM strategies are used to influence these factors so that the alternatives are more competitive with driving alone, thus reducing reliance on motor vehicles.

TDM strategies can be divided into two basic categories:

- ▶ Pre-occupancy: actions that can be done while a development is being designed and built, and
- ▶ Post-occupancy: actions that can be done once people are using the development.

The pre-occupancy actions are critical because they are most likely to determine how attractive, convenient and safe alternative travel will be once the site is occupied. Actions such as modifying the site plan to improve pedestrian safety and convenience or reducing the number of provided parking stalls can encourage a reduction in vehicle trips to the site. After the development is built, further strategies include transit or rideshare subsidies and providing convenient information about where and how to use these alternatives. It should be noted that the actions taken after development will not be as effective if TDM strategies are not initially implemented in the site planning stages. For example, transit subsidies will not be taken advantage of if the closest transit stops are not easy to get to or do not connect with the greater transit network. Thus, it is important to take advantage of both pre-occupancy and post-occupancy TDM strategies.

¹² City of Hamilton, Transportation Demand Management Development Guidelines, June 2015.

The City of Hamilton has developed Transportation Demand Management Land Development Guidelines¹³ that are *“a tool for developers and City staff to include TDM initiatives into new development, redevelopment and existing buildings through the development approval process”*. The guidelines outline the report requirements and provide strategies to support TDM within developments and were referenced in the preparation of this report.

7.1 Potential TDM Measures

There are several reasons why incorporating a TDM plan into a residential site is important:

- ▶ It reduces auto ownership levels, thereby reducing private vehicle trips and congestion;
- ▶ It creates safe and attractive environments that encourage travel by walking, cycling and transit over auto travel; and
- ▶ It supports the development of healthy communities.

The following section outlines potential TDM options available to the site. These measures will enhance the site’s overall convenience, safety and traffic flow by reducing vehicles trips.

7.1.1 Walking

The accessibility of a development is essential in helping to ensure that those that can walk, do. Proper pedestrian connections from the community to the site should be available to ensure safety and to increase the experience of those that choose to walk.

The site plan indicates direct sidewalk connections will be provided from entrances of the buildings to the existing sidewalks along the south side of Frances Avenue and east side of Green Road. Other measures that can be taken that help to improve safety and the attractiveness of the site include providing adequate lighting throughout the site and overhead weather protection near the building’s main entrance and adjacent sidewalks.

7.1.2 Cycling

As outlined in **Section 2.3.2**, the site will be served by bicycle infrastructure. With signed bike routes on Frances Avenue, Shoreview Place and Millen Road the site can facilitate the daily use of bicycles.

To further encourage this use, the development should include visible, well-lit short-term bicycle parking for visitors and secure, indoor bicycle parking storage spaces for tenants/residents. The City’s TDM guidelines specify the recommended number of bicycle parking spaces for residential and retail buildings. These guidelines include the following:

¹³ TDM for Development, Prepared for City of Hamilton by IBI Group, June 2015

- ▶ Long term bicycle parking: 0.50 to 1.25 spaces per dwelling unit or 918 to 2,295 spaces total; and
- ▶ Short term bicycle parking: 0.05 to 0.20 spaces per dwelling unit or 92 to 367 spaces total.

The development will provide both short-term and long-term bicycle parking spaces. **Table 7.1** details the City’s bicycle parking guidelines for the site.

TABLE 7.1: BICYCLE PARKING GUIDELINES

Land Use	Units	Bicycle Parking Requirement		Required Spaces
3.A Residential	1836	Long-term	0.5 to 1.25 spaces per dwelling unit	918 to 2295
		Short-term	0.05 to 0.2 spaces per dwelling unit	92 to 367
Total Spaces				1010 to 2662

The development is providing a total of 444 long-term bicycle parking spaces within bike rooms on each level of the parking garage. This is a deficiency of 474 bicycle parking spaces compared to the TDM Guidelines. However, each unit will also have a storage locker large enough to accommodate a bicycle. Therefore, the potential bicycle parking of the development is 2,280 spaces, well within the City’s guidelines.

A total of 92 short-term bicycle parking spaces will be provided via bike racks paced near the building entrances, which meets the City’s guidelines.

Bicycle parking requirements were not considered for the commercial component, given the small size in comparison to the development. The Stoney Creek Zoning By-law does not detail bicycle parking requirements for commercial sites. If long-term bicycle parking is required by employees of the commercial component, the development may be able to allocate spaces, given the surplus. The short-term bicycle parking required for the residential component will also be available for patrons of the commercial component.

By providing the recommended number of short and long-term bicycle parking stalls, residents, employees and visitors will be more likely to choose to travel to/from the development by cycling. This increase in sustainable transportation results in a reduction of automobile trips and thus a reduction in parking demand should result.

7.1.3 Transit

The use of transit places less reliance on the use of personal automobiles for trips that can be completed by convenient and desirable transit options. As previously discussed, there is no fixed route transit service within the area of

the subject development. Trans-Cab service is available to pick up and transport passengers between the nearest bus stop transfer points approximately 2.0 kilometres from the site. See **Section 2.2** for details on this route as well as connections available to the wider HSR network.

It is recommended that bus route maps and schedules are provided at visible and convenient locations at the site, such as in the building's lobby. It is also recommended that the applicant advocate to the City of Hamilton and HSR to bring fixed route transit service to the area. If fixed route service is provided, it is recommended that weather protected waiting areas such as bus shelters or overhangs be provided at all stop locations. These additions will help to increase transit usage (especially during inclement weather).

7.1.4 Parking

The City's TDM Policy provides guidelines indicating that reducing parking spaces with the intent of encouraging other uses of transportation is possible. However, one should be cautious and not reduce the number of parking spaces to a point in which significant issues are created. As detailed in **Section 6**, the required number of parking spaces varies from a surplus of 134 to a deficiency of 652 depending on the method used for calculation. In order to mitigate any potential parking shortfall, TDM measures detailed in the following sections, consistent with the City's TDM policy should be considered by the applicant to help manage parking. Managing parking supply helps to reduce the undesirable impacts of parking demand on local and regional traffic levels and can result in positive impacts on community livability and design.

To further encourage residents to use sustainable travel modes, the development could consider selling parking spaces separately from the cost of a unit. This is more equitable and efficient since occupants are not forced to pay for parking they do not need and allows consumers to adjust their parking supply to reflect their needs. This is an important factor that supports reducing the parking supply as residents are notified at the onset of the project that parking will be provided on a limited basis as an additional cost in lieu of the price to purchase a unit. If residents are unwilling to change their travel behaviour, they will not purchase a unit.

If the number of parking spaces is reduced, caution should be given to providing adequate accessibility to other transportation modes. Additional provisions should be made, such as providing suitable bike parking, providing suitable access to transit service, and enhancing pedestrian and bike connections to ensure that other modes of transportation are readily accessible.

7.1.5 Carpooling

Ride-share involves two or more people sharing a vehicle for a trip. The cost of the journey (fuel, tolls, parking, etc.) can be split between the driver and passengers, resulting in savings for all concerned. This also reduces the number of vehicle trips and parking demands.

There are several tools available such as Car Pool World, which set up online ride sharing databases. These databases enable people to enter their daily journey so that the database can automatically search out coworkers whose journeys match. A less formal option would be installing notice boards in the lobby of the buildings for residents who may organize informal carpools.

7.1.6 Car-Share

Car sharing is recognized in the City's TDM policy as a means of reducing automobile dependence by providing access to a car on an as-need basis and reducing the need to own a vehicle. The provision of secured car-share spaces in private lots can result in a reduction in residential parking requirements. The TDM policy states that a 2% reduction in the parking will result for providing car-share spaces for 2% of the building occupants. This means that if 37 car-share spaces are provided for the redevelopment, a reduction of 37 spaces to the required building parking spaces will be permitted.

Car-share appeals to a broad range of households from young urban professionals to families who want a lifestyle that is not tied to owning and maintaining a private vehicle. It also attracts those that want to retain the option to drive for primarily non-work trip purposes.

Another option could be providing additional car-share vehicles within walking distance of the site if the current supply of vehicles is insufficient to meet demands.

7.1.7 Individualized Travel Planning

Research has indicated that educating the occupants by going directly to residents increases the likelihood that a shift to more sustainable modes of transportation will occur. The Organisation for Economic Co-operation and Development (OECD) and the Global Environmental Change Program of the UK Economic and Social Research council hosted a workshop¹⁴ that recognized the importance of understanding the forces that motivate and shape individuals' travel behaviour. It identified several key messages of benefit to TDM policy development:

- ▶ **Hierarchy of Choice:** An employer can make decisions that influence how all his or her employees travel to work. Similarly, an individual's decision to buy his or her house may affect how all the members of the household travel. A greater understanding of this hierarchy can assist in identifying those high-order organizations and individual choices. TDM strategies and policies should target those key decision makers.

¹⁴ Organisation for Economic Co-operation and Development (OECD). 1997. Second OECD Workshop on Individual Travel Behaviour: "Culture, Choice and Technology" Final Report. University of Sussex, Brighton, UK 17-19 July 1996. Paris: OECD.

- ▶ Perception: Individuals' perceptions of time, environment, and alternative modes of travel and travel behaviour, determine whether they feel they have a choice in how they travel. For example, people who have rarely taken public transport or cycled may not perceive these modes as suited to their lifestyle because of perceived disadvantages which they associate with these modes. In many cases, individuals over-estimate the benefits of their current choice and under-estimate the capacity of alternative modes to satisfy their needs. Altering these perceptions can open the range of options available to travelers.
- ▶ Culture: Culture plays an important role in determining the status, image and acceptability of different types of travel behaviour. For example, the car has social and cultural attributes that go well beyond its role as a mode of transportation. TDM strategies must consider these cultural factors.
- ▶ Education (Information and Learning): Individuals need targeted, relevant, effective and positive information to better understand the consequences of different travel choices on their own, and their community's quality of life. This information would be most effective if available before individuals engage prior to car and home purchases.

Individual travel planning has demonstrated that working directly with residents/employees as well as providing appropriate infrastructure increases the use of sustainable modes and reduces the site's dependency on vehicles. Therefore, it is an important component to the encouragement of the use of sustainable modes of transportation at the subject site.

The applicant should work with the buildings' residents to form a travel planning committee/team that will help develop individualized travel plans for interested residents. This team could be responsible for:

- ▶ Ensuring up-to-date bus routes and maps are available within the lobbies of the buildings and providing information on next available bus, cost of trip and where to purchase passes;
- ▶ Providing assistance to residents in signing up for and arranging carpool and bike sharing services; and
- ▶ Developing specific travel plans using alternative modes of transportation (HSR travel planning, etc.), including total trip time.

Additionally, the applicant should consider provision of a kiosk or message/bulletin board within the building entrance for use by the committee/team.

7.2 TDM Summary

The proposed site with nearby connections to bicycle facilities and transit routes has the potential to be an accessible development. Further enhancing

these elements inside and outside the boundaries of the development will ensure these opportunities do not go unused. The City's outcomes for incorporating TDM with new development include the following:

- ▶ Promoting more attractive streetscapes that are inclusive and inviting for everyone;
- ▶ Developing neighbourhoods and districts with a variety of uses that allow people to live and work in closer proximity;
- ▶ Preserving streets and public space for a more balanced transportation system; and
- ▶ Promoting public health and active lifestyles.

By incorporating the TDM options previously discussed, such as improving walking and cycling facilities, reducing the parking supply and developing individualized travel plans for residents (alternative mode trip planning, car share arrangements, etc.), the site will set the tone for the surrounding area in helping to achieve these City goals.

8 Conclusions and Recommendations

8.1 Conclusions

Based on the investigations carried out, it is concluded that:

Existing Traffic Operations

Under existing traffic conditions, all intersections within the study area are operating at acceptable levels of service during the AM and PM peak hours. The following critical movement is noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS D during the PM peak hour with a v/c ratio of 0.28. The low v/c ratio on this movement indicates the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

Development Generated Traffic

At full build-out, the development is forecast to generate 556 and 666 trips during the AM and PM peak hours, respectively.

2021 Background Traffic Operations

Under 2021 background traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movement is noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS D with a v/c of 0.32 during the AM peak hour and LOS F with a v/c of 0.57 during the PM peak hour. The low to moderate v/c ratios indicate the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

2021 Total Traffic Operations (Phase 1)

Under 2021 total traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS E with a v/c ratio of 0.58 during the AM peak hour and LOS F with a v/c ratio of 1.25 during the PM peak hour. The 95th percentile queue is forecast to

exceed the available storage by 11 metres during the PM peak hour;

- Southbound right-turn movement – LOS D with a v/c ratio of 0.59 during the AM peak hour; and
- The moderate v/c ratios during the AM peak hour indicate the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

2023 Background Traffic Operations

Under 2023 background traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 0.62 during the AM peak hour and LOS F with a v/c ratio of 1.40 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 16 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.62 during the AM peak hour; and
 - The moderate v/c ratios during the AM peak hour indicate the delay is due to the high volume of through traffic on North Service Road which limits available gaps for side street traffic.

2023 Total Traffic Operations (Phase 2)

Under 2023 total traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS E with a v/c ratio of 0.93 during the AM peak hour and LOS F with a v/c ratio of 2.66 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 15 metres during the AM peak hour and 51 metres during the PM peak hour;
 - Southbound right-turn movement – LOS D with a v/c ratio of 0.95 during the AM peak hour; and
 - Overall intersection – LOS E during the PM peak hour.

2025 Background Traffic Operations

Under 2025 background traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 1.0 during the AM peak hour and LOS F with a v/c ratio of 2.97 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 21 metres during the AM peak hour and 55 metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 1.01 during the AM peak hour; and
 - Overall intersection – LOS D during the AM peak hour and LOS F during the PM peak hour.

2025 Total Traffic Operations (Full Build-Out)

Under 2025 total traffic conditions all intersections within the study area are forecast to operate at overall acceptable levels of service. The following critical movements are noted:

- ▶ Green Road and Frances Avenue:
 - Westbound left-turn/through/right-turn movement – LOS D with a v/c ratio of 0.79 during the AM and 0.74 during the PM peak hour.
- ▶ North Service Road and Green Road:
 - Southbound left-turn movement – LOS F with a v/c ratio of 1.40 during the AM peak hour and a v/c ratio of 5.47 during the PM peak hour. The 95th percentile queue is forecast to exceed the available storage by 59 metres during the AM peak hour and 55+ metres during the PM peak hour;
 - Southbound right-turn movement – LOS F with a v/c ratio of 1.33 during the AM peak hour; and
 - Overall intersection – LOS F during the AM and PM peak hours.

Remedial Measures

The following remedial measures are required in order to provide acceptable levels of service at the study area intersections:

- ▶ Traffic signals at the intersection of North Service Road and Green Road. Although not warranted until 2025, the signals should be installed as part of Phase 1 of the development (2021) to provide acceptable levels of service on all approaches;

- ▶ A separate westbound right-turn lane should be provided at the intersection of North Service Road and Green Road at the 2025 horizon. This lane warrants 7.5 metres of storage and 120 metres of taper and parallel lane; however, due to environmental constraints, only 10 metres of storage and 15.8 metres of taper can be provided within the right-of-way without significant reconstruction;
- ▶ A separate westbound left-turn lane should be provided at the intersection of Green Road and Frances Avenue at the 2025; and
- ▶ The southbound left-turn lane at North Service Road and Green Road should be increased by 15 metres by the 2025 horizon.

These improvements are directly related to the increase in traffic due to development of the subject site.

Parking Assessment

City of Stoney Creek By-law Parking Requirements

Based on the City of Stoney Creek Zoning By-law 3692-92, a total of 3,090 parking spaces will be required to service the residential component of the site. A total of 2,438 spaces are proposed. This is a deficiency of 652 spaces or 21% of the By-law parking requirement.

Proxy Site Survey Data

Parking utilization surveys were undertaken at a proxy site in Burlington, Ontario (3060/3070 Rotary Way). Based on the maximum observed demand at the proxy sites, a total of 2,295 spaces would be required to service the site during the peak weekday period. A total of 2,438 spaces are proposed. This is a surplus of 143 spaces or 106% of the proxy site parking requirement.

Overall Findings

The Zoning By-law results in a deficiency in parking of 652 spaces and the proxy site data results in a surplus of 143 spaces. The proxy site data provides an accurate representation of the parking demands for the site as they are based on area-specific data and not a general Zoning By-law. Additionally, it further supports a reduction in parking requirements for the site. Therefore, the proposed parking supply should adequately accommodate the parking demands of the site.

TDM Options

The proposed site with nearby connections to bicycle facilities and transit routes has the potential to be an accessible development. Further enhancing these elements inside and outside the boundaries of the development will ensure these opportunities do not go unused.

By incorporating the TDM options contained in this report, such as improving walking and cycling facilities, reducing the parking supply and developing individualized travel plans for residents (alternative mode trip planning, carpool arrangements, etc.), the site will set the tone for the surrounding area in helping to achieve the City's long-term transportation goals.

8.2 Recommendations

Based on the findings of this study, it is recommended that:

- ▶ The City of Hamilton recognize the conclusions drawn above;
- ▶ The site be allowed to be developed as planned;
- ▶ The site driveway connections operate under stop sign control;
- ▶ The City install traffic signals at the intersection of North Service Road and Green Road by buildout of Phase 1 in 2021. The signal timing and phasing should be optimized as required;
- ▶ A separate westbound right-turn lane with 10 metres of storage and 15.8 metres of taper should be provided at the intersection of North Service Road and Green Road at the 2025 horizon;
- ▶ A separate westbound left-turn lane with 45 metres storage should be provided at the intersection of Green Road and Frances Avenue at the 2025 horizon. This can be accomplished through pavement markings;
- ▶ The southbound left-turn lane at North Service Road and Green Road should be extended by 15 metres by the 2025 horizon. This can be accomplished through pavement markings; and
- ▶ The applicant should ensure proper pedestrian and cyclist connections from the surrounding roads to the buildings' main entrances;
- ▶ Current bus schedules are provided within the lobby of each building to further promote the use of transit; and
- ▶ The buildings' management should work with the buildings' residents to form a travel planning committee/team that will help develop individualized travel plans (alternative mode trip planning, carpool arrangements, etc.) for interested residents. To assist the committee/team, the applicant should consider providing a kiosk within the lobby of each building for use by the committee/team.

Appendix A

Pre-Study Consultation Documentation

Heather Goodman

From: Heather Goodman
Sent: April 11, 2018 8:58 AM
To: 'Transportation Planning'
Subject: RE: 180010 (Waterfront Trails TIS & PS) - Scope of Work

Hi Tiffany,

Do you know if there are any updates on the review of our scope? Specifically, we would like to confirm the correct by-law.

Thanks,

Heather Goodman, B.Eng., EIT, MITE
Transportation Consultant



Paradigm Transportation Solutions Limited

p: 416.479.9684 x502
m: 905.506.0454

From: Wolsey, Tiffany [mailto:Tiffany.Wolsey@hamilton.ca] **On Behalf Of** Transportation Planning
Sent: March 5, 2018 2:09 PM
To: Heather Goodman <hgoodman@ptsl.com>
Subject: RE: 180010 (Waterfront Trails TIS & PS) - Scope of Work

Hello,

The planner on file will be able to advise you on the appropriate bylaw to use for the parking study.

Thank you,

Tiffany Wolsey

Transportation Management Coordinator
Transportation Planning
Planning & Economic Development Department

From: Heather Goodman [mailto:hgoodman@ptsl.com]
Sent: January-26-18 5:59 PM
To: Transportation Planning
Cc: Jill Juhlke
Subject: RE: 180010 (Waterfront Trails TIS & PS) - Scope of Work

Hello,

In addition to the information requested below, could you please confirm the By-law to use for the parking study.

I look forward to your comments.

Regards,

Heather Goodman, B.Eng., EIT, MITE
Transportation Consultant



Paradigm Transportation Solutions Limited

p: 416.479.9684 x502
m: 905.506.0454

From: Heather Goodman
Sent: January 26, 2018 10:25 AM
To: 'Ng, Jeffrey' <Jeffrey.Ng@hamilton.ca>
Cc: Jill Juhlke <jjuhlke@ptsl.com>; Transportation Planning <Transportation.Planning@hamilton.ca>
Subject: RE: 180010 (Waterfront Trails TIS & PS) - Scope of Work

Thanks Jeff, I appreciate you sending the scope forward.

Regards,

Heather Goodman, B.Eng., EIT, MITE
Transportation Consultant



Paradigm Transportation Solutions Limited

p: 416.479.9684 x502
m: 905.506.0454

From: Ng, Jeffrey [<mailto:Jeffrey.Ng@hamilton.ca>]
Sent: January 26, 2018 10:24 AM
To: Heather Goodman <hgoodman@ptsl.com>
Cc: Jill Juhlke <jjuhlke@ptsl.com>; Transportation Planning <Transportation.Planning@hamilton.ca>
Subject: RE: 180010 (Waterfront Trails TIS & PS) - Scope of Work

Hi Heather,

Unfortunately our section is no longer reviewing development applications. I've copied Transportation Planning who will be able to assist moving forward.

Thanks,

Jeff Ng

Traffic Technologist
Geomatics & Corridor Management
City of Hamilton
Engineering Services, Public Works Dept.
Tel: 905-546-2424 ext 4577
Fax: 905-540-5926

Permit Applications: <http://hamilton.ca/cm>
Road Closure Notices: <http://hamilton.ca/roadclosures>

From: Heather Goodman [<mailto:hgoodman@ptsl.com>]
Sent: January 26, 2018 10:12 AM
To: Ng, Jeffrey <Jeffrey.Ng@hamilton.ca>
Cc: Jill Juhlke <jjuhlke@ptsl.com>
Subject: 180010 (Waterfront Trails TIS & PS) - Scope of Work

Hi Jeff,

Paradigm would like to inform the City that we will be undertaking a Transportation Impact Study (TIS) and Parking Justification Study for lands located the northeast corner of North Service Road and Green Road, detailed in the enclosed project overview and work plan. We ask that you please review the work plan to ensure the scope of the study is acceptable and provide comments if necessary.

In addition, we will use the following details for the study:

- The traffic impact study will be prepared to conform to the City's Traffic Impact Study Guidelines will assess the 2021, 2023 and 2025 horizon years, consistent with the completion of each phase of development.
- To remain consistent with other TIS reports for the area, a growth rate of 2% per year, and all development data from the 101 Shoreview TIS Report & 560 Grays Road TIS Report completed by Paradigm in July 2017 and November 2017, respectively will be utilized.

Due to the time sensitive nature of the project, we ask that you please provide comments at your earliest convenience. Please do not hesitate to contact me if you have questions relating to this project.

Regards,

Heather Goodman, B.Eng., EIT, MITE
Transportation Consultant



Paradigm Transportation Solutions Limited

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26 January 2018
Project: 170247

Jeff Ng
Traffic Technologist
City of Hamilton
77 James Street North, Suite 400
Hamilton, ON L8R 2K3

Dear Mr. Ng:

**RE: 560 GRAYS ROAD, CITY OF HAMILTON
TRAFFIC IMPACT STUDY UPDATE SCOPE OF WORK**

Paradigm Transportation Solutions Limited (Paradigm) was retained on behalf of **New Horizon Development Group** (the Client) to carry out a Transportation Impact Study (TIS) and Parking Justification Study update for the Waterfront Trails Development lands in Hamilton, Ontario.

The Waterfront Trails Development is located in the northeast quadrant of the intersection of North Service Road and Green Road in the Stoney Creek area of the City of Hamilton. The development proposal includes a total of 1,500 residential apartment units contained within three to four high-rise buildings.

This development is located in the Green Millen Shore Estates (GMSE) development area. Over the past couple of years, Paradigm has completed extensive analyses of multiple developments within this area. We will rely on this experience and our knowledge of the area in preparing this study.

Work Plan

Based on our understanding of the development proposal and the City requirements, we proposed to carry out the following scope of work:

- ▶ **Task 1 – Pre-Study Consultation:** We will submit a scope of work to the City of Hamilton to obtain their comments and approval on the approach and methodology proposed in this work plan prior to making significant progress on the studies.
- ▶ **Task 2 – Data Collection:** We will request from the City the most recent signal timing plans (where applicable) and Paradigm will collect turning movement counts at the following study area intersections:
 - North Service Road and Green Road (stop controlled); and
 - North Service Road and Millen Road (stop controlled).

- ▶ **Task 3 – Site Visit:** Paradigm staff will conduct a site visit to inventory the traffic and roadway conditions in the immediate area of the proposed development, traffic control, adjacent driveway locations, adjacent land use and operational conditions within the study area. The site visit will also include confirming traffic regulations and parking restrictions along the study area roadways.
- ▶ **Task 4 – Traffic Forecasting:** We will prepare trip generation estimates for three horizons reflecting the anticipated completion of each building as follows:
 - Tower 1 – 2021 horizon: 44 storeys containing 487 units;
 - Tower 2 – 2023 horizon: 50 storeys containing 570 units; and
 - Tower 3 – 2025 horizon: 39 storeys containing 435 units.
- ▶ **Task 5 – Operational Analyses:** Using the traffic forecasts developed in Task 1, we will analyze the operations of the intersection of North Service Road and Green Road and North Service Road and Millen Road during the weekday AM and PM peak hours for each phase of development (2021, 2023 and 2025) both without and with full development of the site. These analyses will be conducted to meet City of Hamilton traffic impact study guidelines.
- ▶ **Task 6 – Remedial Measures Responsibility:** We will provide specific information outlining what remedial measures are required (under background or future total conditions) at each horizon and highlight those needed to support the proposed development.
- ▶ **Task 7 – Report and Recommendations:** Paradigm will prepare a detailed final report documenting our investigations, findings and recommendations, including the Synchro 9 capacity analysis. This report will also include the Parking Justification. The final report will include appendices containing relevant traffic data as well as the detailed output generated by the operational analysis software.

Parking Justification Study

Based on the information provided, the Client will be seeking a variance to supply less than the parking required under the current in-force City of Hamilton Zoning By-law (05-200). Based on our extensive traffic and parking study experience in Hamilton, we have local data that confirms that a variance can be sought.

- ▶ **Task 8 – Area Parking Inventory:** Paradigm staff will undertake an inventory of the current available on-street parking within convenient walking distance of the site. The inventory will be summarized by block and sub-area including the number of spaces, type of parking and time restrictions. This will be used to demonstrate the additional potential supply of parking available if there are times when spillover parking may be required.
- ▶ **Task 9 – Parking Generation:** Paradigm will review the ITE Parking Generation – 4th Edition to assess the parking generation for the site based on the proposed land uses. Furthermore, we will look at the TTS data for the area and consider automobile ownership and the percentage of trips made by alternative modes of travel. We will use Paradigm’s in-house parking generation data collected for apartment units to develop a site-specific parking generation rate for the proposed development.



- ▶ **Task 10 – Parking Assessment:** Based on the planned on-site parking supply, we will assess the extent to which parking demand can be accommodated on the site and the potential for spill-over parking that may need to be accommodated within the surrounding area.

We trust the foregoing work plan is acceptable. If you have any questions related to this project, please contact me at (905) 381-2229 x103 or (519) 896-3163 x103 or by email at selkins@ptsl.com.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



Stew Elkins
B.E.S., MITE
Vice-President



Appendix B

Detailed Turning Movement Count Data

East/West Street: Frances
 North/South Street: Green Rd
 Date: Wednesday, June 24, 2015
 Counted By: Chris D
 TIME
 ENDING

	EASTBOUND							WESTBOUND						NORTHBOUND						SOUTHBOUND												
	Vehicles						Peds	Bikes	Vehicles						Peds	Bikes	Vehicles						Peds	Bikes								
	Left	Trucks	Thru	Trucks	Right	Trucks			Left	Trucks	Thru	Trucks	Right	Trucks			Left	Trucks	Thru	Trucks	Right	Trucks			Left	Trucks	Thru	Trucks	Right	Trucks		
7:15					3		1						6		1				2		2					17		2				2
7:30	1		1		5								8		3						2					12		2				1
7:45			2		6								5		2						4					11						
8:00	1		1		3									2	4		1				5				11							
8:15			3		3								7		3				2		3	1	2			15		4				
8:30			1		3								5		4						3		4			7						1
8:45	6	1			3								6		3						3		4			18		1				
9:00	3		1		5								6		4						5		3	1		11		2				
Total	9	1	5	0	14	0	2	1	24	0	14	0	0	0	3	1	4	0	14	1	13	1	0	0	0	0	51	0	7	0	1	0
Mvmt Tot		10		5		14	2	1	24		14		0	0	3	1	4		15		14		0	0	0	51		7		1	0	
% Truck		10%		0%		0%			0%		0%		0%	0%	3%	1%	0%		7%		7%		0%	0%	0%	0%	0%	0%		1%	0%	

TIME
ENDING

	EASTBOUND							WESTBOUND						NORTHBOUND						SOUTHBOUND													
	Vehicles						Peds	Bikes	Vehicles						Peds	Bikes	Vehicles						Peds	Bikes									
	Left	Trucks	Thru	Trucks	Right	Trucks			Left	Trucks	Thru	Trucks	Right	Trucks			Left	Trucks	Thru	Trucks	Right	Trucks			Left	Trucks	Thru	Trucks	Right	Trucks			
15:15	3		1		5		2	3	5		3				1	4	2		10		4			2	1	13		2		3		6	
15:30	7	1	4		2				9	1	3			2					3		6		1		1	10		1					
15:45	3		6		5			1	2		1					3			4		9		4	1		9		1				1	
16:00	5		1		4		1		3	1	1								6		11		2		2	9		1		3			
16:15	5		1		5		1	4	2		3					1			4		13		5		1	5		2					
16:30	3		4		5		1	1	1	1									1		13		6			8		1					
16:45	2		2		2			3	20					1					4		15		7			3		5			1	1	
17:00	3		5		4				6							1			5		9		5			10		1					
17:15			3		8		2		6		1					3			5		6		6			3				2			
17:30	4		3		5		1		6							4			5		10		7			4							
17:45			4		4			1	4		4								3		9		7		1		3				1		
18:00			2		2		4		4		1					1			2		7		4				6						
Total	13	0	12	0	16	0	2	8	29	1	3	0	1	0	1	2	14	0	50	0	23	0	1	0	3	0	28	0	4	0	1	1	
Mvmt Tot		13		12		16	2	8	30		3		1	1	1	2	14		50		23		1	0	3		28		4		1	1	
% Truck		0%		0%		0%			3%		0%		0%	0%	1%	2%	0%		0%		0%		0%	0	0%	0%	0%		0%		1%	1%	

Date: Tuesday 02-May-17	North Service Rd Eastbound							North Service Rd Westbound							Green Rd Southbound							
	Left			Through				Peds	Through			Right			Peds	Left			Right			Peds
	Cars	T/B	Cyclists	Cars	T/B	Cyclists	Cars		T/B	Cyclists	Cars	T/B	Cyclists	Cars		T/B	Cyclists	Cars	T/B	Cyclists		
7:00-7:15	11			6	1			67	3		6	1			6			14	1			
7:15-7:30	4			2				74	5		6	1			12			22				
7:30-7:45	4	1		6	3			147	4		7	1			8	1		21				
7:45-8:00	5			13	1			154	4		6	1			16			19				
8:00-8:15	6			11				114	4		8	1			15			20				
8:15-8:30	0			4				102	7		5	2			19			16				
8:30-8:45	1			8				115	6		8				13			13				
8:45-9:00	8	1		18				81	4		11				8			11				

4:00-4:15	21			68				47	4		14				11			15			
4:15-4:30	15			68	1			50	7		7				7	2		12			
4:30-4:45	15			82				74	6		9				16			10			
4:45-5:00	20			123				38	1		13				15	1		10			
5:00-5:15	23			118	1			57	5		11	1			17			10			
5:15-5:30	24			135	2			50	4		12				3			12			
5:30-5:45	21			129	2			38	3		9				8			6			
5:45-6:00	17			83	1			26	1		8				7			7			

City of Hamilton

TURNING MOVEMENT FLOW CHART

Loc. Code: 35

Intersection:
 Direction:
 Road Condition: Dry
 Comments:

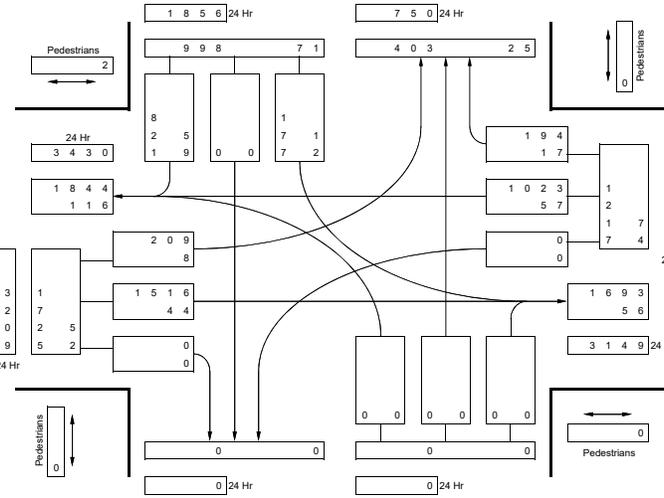
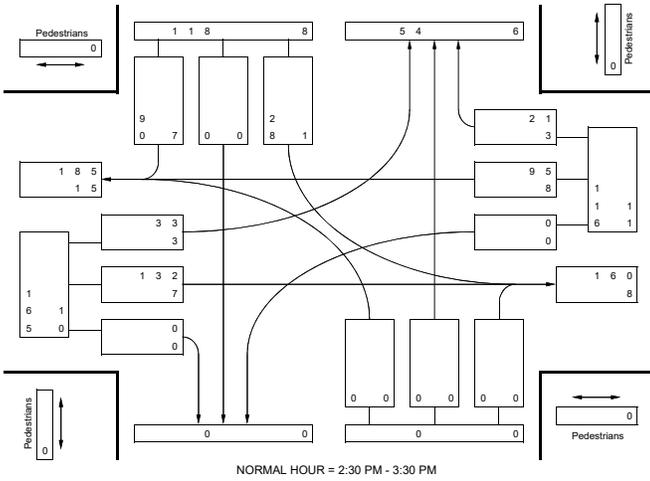
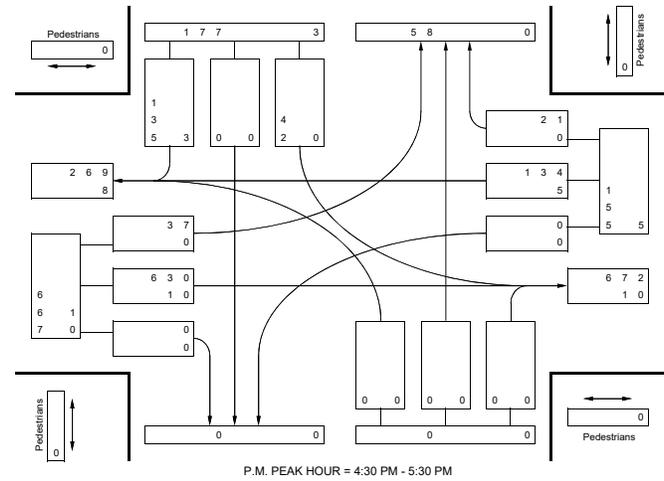
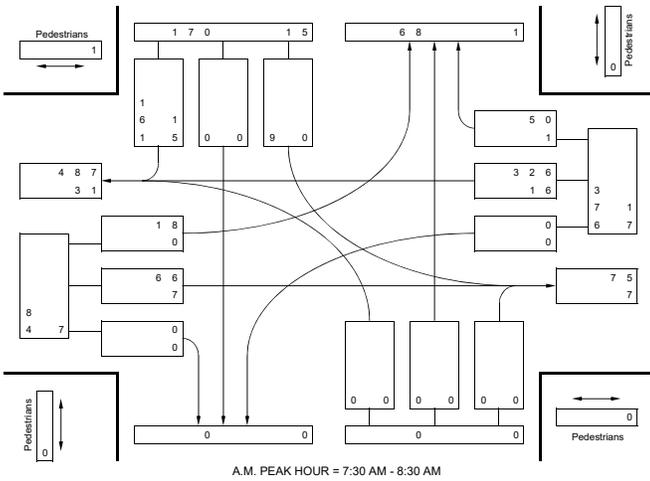
North Service Rd
 (East/West)

at
 Weather: Clear

Millen Rd
 (North/South)

Total Vehicles: 3,940
 M.V.E./Year: 2.492
 AWDT Factor: 1.86

Date: Friday
 May 6, 2016
 Period: 7 hours



Appendix C

Base Year Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-13-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	11	5	15	63	15	0	4	16	28	0	54	7
Future Volume (vph)	11	5	15	63	15	0	4	16	28	0	54	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.935						0.921			0.984	
Flt Protected		0.982			0.961			0.996				
Satd. Flow (prot)	0	1683	0	0	1826	0	0	1637	0	0	1870	0
Flt Permitted		0.982			0.961			0.996				
Satd. Flow (perm)	0	1683	0	0	1826	0	0	1637	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	12	5	16	68	16	0	4	17	30	0	59	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	84	0	0	51	0	0	67	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-13-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	11	5	15	63	15	0	4	16	28	0	54	7
Future Volume (Veh/h)	11	5	15	63	15	0	4	16	28	0	54	7
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)	12	5	16	68	16	0	4	17	30	0	59	8
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								185				
pX, platoon unblocked												
vC, conflicting volume	114	123	65	124	112	36	69				50	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114	123	65	124	112	36	69				50	
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	99	98	92	98	100	100				100	
cM capacity (veh/h)	825	766	1003	830	777	1039	1542				1566	

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	33	84	51	67
Volume Left	12	68	4	0
Volume Right	16	0	30	8
cSH	891	819	1542	1566
Volume to Capacity	0.04	0.10	0.00	0.00
Queue Length 95th (m)	0.9	2.7	0.1	0.0
Control Delay (s)	9.2	9.9	0.6	0.0
Lane LOS	A	A	A	
Approach Delay (s)	9.2	9.9	0.6	0.0
Approach LOS	A	A		
Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization	22.6%		ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-13-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	16	47	574	32	60	72
Future Volume (vph)	16	47	574	32	60	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.993			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1800	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1800	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	17	51	624	35	65	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	51	659	0	65	78
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-13-2018

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	16	47	574	32	60	72
Future Volume (Veh/h)	16	47	574	32	60	72
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	51	624	35	65	78
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	660				728	642
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	660				728	642
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	98				83	84
cM capacity (veh/h)	904				383	477

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	17	51	659	65	78
Volume Left	17	0	0	65	0
Volume Right	0	0	35	0	78
cSH	904	1700	1700	383	477
Volume to Capacity	0.02	0.03	0.39	0.17	0.16
Queue Length 95th (m)	0.5	0.0	0.0	4.8	4.6
Control Delay (s)	9.1	0.0	0.0	16.3	14.0
Lane LOS	A			C	B
Approach Delay (s)	2.3		0.0	15.1	
Approach LOS				C	

Intersection Summary

Average Delay		2.7			
Intersection Capacity Utilization		43.3%		ICU Level of Service	A
Analysis Period (min)		15			

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-13-2018

	↖	→	←	↙	↘	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖	↖		↖	↖
Traffic Volume (vph)	28	79	382	55	11	224
Future Volume (vph)	28	79	382	55	11	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	0.0	25.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Friction			0.983			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1820	0	1504	1583
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1719	1810	1820	0	1504	1583
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	30	86	415	60	12	243
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	86	475	0	12	243
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

3: North Service Road & Millen Road

06-13-2018

	↖	→	←	↙	↘	
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖	↖		↖	↖
Traffic Volume (veh/h)	28	79	382	55	11	224
Future Volume (Veh/h)	28	79	382	55	11	224
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	86	415	60	12	243
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	475				591	445
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	475				591	445
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	97				97	60
cM capacity (veh/h)	1072				429	613

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	30	86	475	255
Volume Left	30	0	0	12
Volume Right	0	0	60	243
cSH	1072	1700	1700	643
Volume to Capacity	0.03	0.05	0.28	0.40
Queue Length 95th (m)	0.7	0.0	0.0	15.2
Control Delay (s)	8.5	0.0	0.0	14.6
Lane LOS	A			B
Approach Delay (s)	2.2		0.0	14.6
Approach LOS				B

Intersection Summary

Average Delay	4.7
Intersection Capacity Utilization	44.0%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

1: Green Road & Frances Avenue

06-13-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	14	13	17	37	3	1	15	53	69	3	30	4
Future Volume (vph)	14	13	17	37	3	1	15	53	69	3	30	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.948			0.997			0.932			0.986	
Flt Protected		0.984			0.957			0.995			0.996	
Satd. Flow (prot)	0	1772	0	0	1765	0	0	1762	0	0	1866	0
Flt Permitted		0.984			0.957			0.995			0.996	
Satd. Flow (perm)	0	1772	0	0	1765	0	0	1762	0	0	1866	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	15	14	18	40	3	1	16	58	75	3	33	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	44	0	0	149	0	0	40	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 23.7% ICU Level of Service A
 Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: Green Road & Frances Avenue

06-13-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	14	13	17	37	3	1	15	53	69	3	30	4
Future Volume (Veh/h)	14	13	17	37	3	1	15	53	69	3	30	4
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)	15	14	18	40	3	1	16	58	75	3	33	4
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	174	209	38	196	174	98	39			134		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	174	209	38	196	174	98	39			134		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	94	100	100	99			100		
cM capacity (veh/h)	779	681	1037	727	713	963	1581			1462		

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	47	44	149	40
Volume Left	15	40	16	3
Volume Right	18	1	75	4
cSH	822	730	1581	1462
Volume to Capacity	0.06	0.06	0.01	0.00
Queue Length 95th (m)	1.5	1.5	0.2	0.0
Control Delay (s)	9.6	10.2	0.9	0.6
Lane LOS	A	B	A	A
Approach Delay (s)	9.6	10.2	0.9	0.6
Approach LOS	A	B		

Intersection Summary

Average Delay 3.8
 Intersection Capacity Utilization 23.7% ICU Level of Service A
 Analysis Period (min) 15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-13-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Traffic Volume (vph)	90	681	260	47	45	39
Future Volume (vph)	90	681	260	47	45	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.979			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1751	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1751	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	98	740	283	51	49	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	740	334	0	49	42
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

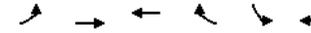
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-13-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Traffic Volume (veh/h)	90	681	260	47	45	39
Future Volume (Veh/h)	90	681	260	47	45	39
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	740	283	51	49	42
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	334				1244	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	334				1244	308
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				72	94
cM capacity (veh/h)	1237				177	736

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	98	740	334	49	42
Volume Left	98	0	0	49	0
Volume Right	0	0	51	0	42
cSH	1237	1700	1700	177	736
Volume to Capacity	0.08	0.44	0.20	0.28	0.06
Queue Length 95th (m)	2.1	0.0	0.0	8.6	1.4
Control Delay (s)	8.2	0.0	0.0	33.0	10.2
Lane LOS	A			D	B
Approach Delay (s)	1.0		0.0	22.4	
Approach LOS				C	

Intersection Summary

Average Delay	2.3
Intersection Capacity Utilization	45.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-13-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	60	666	145	28	48	162
Future Volume (vph)	60	666	145	28	48	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	0.0	25.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.978			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1798	0	1805	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1863	1798	0	1805	1583
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	65	724	158	30	52	176
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	724	188	0	52	176
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

3: North Service Road & Millen Road

06-13-2018

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	60	666	145	28	48	162
Future Volume (Veh/h)	60	666	145	28	48	162
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	724	158	30	52	176
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	188				1027	173
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	188				1027	173
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				79	80
cM capacity (veh/h)	1398				250	871

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	65	724	188	228
Volume Left	65	0	0	52
Volume Right	0	0	30	176
cSH	1398	1700	1700	1095
Volume to Capacity	0.05	0.43	0.11	0.21
Queue Length 95th (m)	1.2	0.0	0.0	6.3
Control Delay (s)	7.7	0.0	0.0	13.1
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	13.1
Approach LOS				B

Intersection Summary	
Average Delay	2.9
Intersection Capacity Utilization	45.1%
Analysis Period (min)	15
	ICU Level of Service A

Appendix D

2021 Background Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	5	16	67	16	0	4	17	30	0	57	7
Future Volume (vph)	12	5	16	67	16	0	4	17	30	0	57	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.934						0.919			0.985	
Flt Protected		0.982			0.961			0.996				
Satd. Flow (prot)	0	1680	0	0	1826	0	0	1633	0	0	1872	0
Flt Permitted		0.982			0.961			0.996				
Satd. Flow (perm)	0	1680	0	0	1826	0	0	1633	0	0	1872	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	13	5	17	73	17	0	4	18	33	0	62	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	0	0	90	0	0	55	0	0	70	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	5	16	67	16	0	4	17	30	0	57	7
Future Volume (Veh/h)	12	5	16	67	16	0	4	17	30	0	57	7
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)	13	5	17	73	17	0	4	18	33	0	62	8
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	120	130	68	131	118	38	72				54	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120	130	68	131	118	38	72				54	
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	99	98	98	91	98	100	100			100	
cM capacity (veh/h)	817	759	999	821	771	1036	1538				1560	

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	35	90	55	70
Volume Left	13	73	4	0
Volume Right	17	0	33	8
cSH	886	811	1538	1560
Volume to Capacity	0.04	0.11	0.00	0.00
Queue Length 95th (m)	1.0	3.0	0.1	0.0
Control Delay (s)	9.2	10.0	0.6	0.0
Lane LOS	A	A	A	
Approach Delay (s)	9.2	10.0	0.6	0.0
Approach LOS	A	A		

Intersection Summary	
Average Delay	5.0
Intersection Capacity Utilization	23.1%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↕	↔
Traffic Volume (vph)	17	145	838	34	64	76
Future Volume (vph)	17	145	838	34	64	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1808	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1808	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	18	158	911	37	70	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	158	948	0	70	83
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

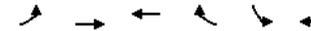
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.5%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↕	↔
Traffic Volume (veh/h)	17	145	838	34	64	76
Future Volume (Veh/h)	17	145	838	34	64	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	158	911	37	70	83
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	949				1124	930
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	949				1124	930
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	97				68	75
cM capacity (veh/h)	703				221	326

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	18	158	948	70	83
Volume Left	18	0	0	70	0
Volume Right	0	0	37	0	83
cSH	703	1700	1700	221	326
Volume to Capacity	0.03	0.09	0.56	0.32	0.25
Queue Length 95th (m)	0.6	0.0	0.0	10.4	7.9
Control Delay (s)	10.3	0.0	0.0	28.7	19.8
Lane LOS	B			D	C
Approach Delay (s)	1.0		0.0	23.8	
Approach LOS				C	

Intersection Summary

Average Delay		3.0			
Intersection Capacity Utilization		57.5%		ICU Level of Service	B
Analysis Period (min)		15			

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	123	86	408	88	71	464
Future Volume (vph)	123	86	408	88	71	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.976			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1802	0	1504	1583
Flt Permitted	0.381				0.950	
Satd. Flow (perm)	689	1810	1802	0	1504	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			23			289
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	134	93	443	96	77	504
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	93	539	0	77	504
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Lanes, Volumes, Timings

3: North Service Road & Millen Road

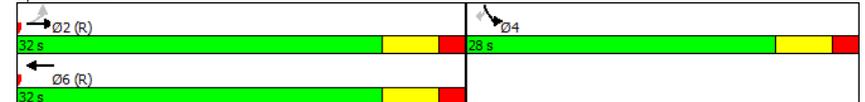
06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	32.0	32.0	32.0		28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%		46.7%	46.7%
Maximum Green (s)	26.0	26.0	26.0		22.0	22.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Min	Min
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	32.5	32.5	32.5		15.5	15.5
Actuated g/C Ratio	0.54	0.54	0.54		0.26	0.26
v/c Ratio	0.36	0.09	0.55		0.20	0.81
Control Delay	13.6	8.8	12.6		16.6	19.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	13.6	8.8	12.6		16.6	19.1
LOS	B	A	B		B	B
Approach Delay		11.6	12.6		18.8	
Approach LOS		B	B		B	

Intersection Summary

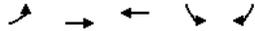
Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	15.1
Intersection Capacity Utilization:	66.8%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: North Service Road & Millen Road



Queues
 3: North Service Road & Millen Road

06-14-2018

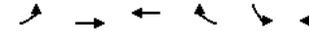


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	134	93	539	77	504
w/c Ratio	0.36	0.09	0.55	0.20	0.81
Control Delay	13.6	8.8	12.6	16.6	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	8.8	12.6	16.6	19.1
Queue Length 50th (m)	7.9	4.6	34.3	7.0	21.6
Queue Length 95th (m)	25.0	13.5	77.6	13.6	47.6
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	373	981	987	551	763
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.36	0.09	0.55	0.14	0.66

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

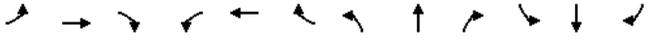
06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Traffic Volume (vph)	123	86	408	88	71	464
Future Volume (vph)	123	86	408	88	71	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1810	1802		1504	1583
Flt Permitted	0.38	1.00	1.00		0.95	1.00
Satd. Flow (perm)	690	1810	1802		1504	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	93	443	96	77	504
RTOR Reduction (vph)	0	0	11	0	0	214
Lane Group Flow (vph)	134	93	528	0	77	290
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	32.5	32.5	32.5		15.5	15.5
Effective Green, g (s)	32.5	32.5	32.5		15.5	15.5
Actuated g/C Ratio	0.54	0.54	0.54		0.26	0.26
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)	373	980	976		388	408
v/s Ratio Prot		0.05	c0.29			0.05
v/s Ratio Perm	0.19					c0.18
w/c Ratio	0.36	0.09	0.54		0.20	0.71
Uniform Delay, d1	7.8	6.6	8.9		17.4	20.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.7	0.2	2.2		0.3	5.6
Delay (s)	10.5	6.8	11.1		17.6	25.8
Level of Service	B	A	B		B	C
Approach Delay (s)		9.0	11.1		24.7	
Approach LOS		A	B		C	
Intersection Summary						
HCM 2000 Control Delay		16.6			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.60				
Actuated Cycle Length (s)		60.0			Sum of lost time (s)	12.0
Intersection Capacity Utilization		66.8%			ICU Level of Service	C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

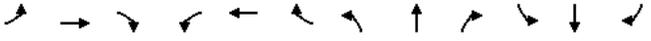


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	15	14	18	39	3	1	16	56	73	3	32	4
Future Volume (vph)	15	14	18	39	3	1	16	56	73	3	32	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.947			0.997			0.932			0.987	
Flt Protected		0.985			0.956			0.995			0.996	
Satd. Flow (prot)	0	1772	0	0	1763	0	0	1762	0	0	1868	0
Flt Permitted		0.985			0.956			0.995			0.996	
Satd. Flow (perm)	0	1772	0	0	1763	0	0	1762	0	0	1868	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	16	15	20	42	3	1	17	61	79	3	35	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	46	0	0	157	0	0	42	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	15	14	18	39	3	1	16	56	73	3	32	4
Future Volume (Veh/h)	15	14	18	39	3	1	16	56	73	3	32	4
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)	16	15	20	42	3	1	17	61	79	3	35	4
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	183	220	40	207	182	102	41			141		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183	220	40	207	182	102	41			141		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	98	94	100	100	99		100		
cM capacity (veh/h)	768	671	1034	712	704	956	1579			1453		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	51	46	157	42
Volume Left	16	42	17	3
Volume Right	20	1	79	4
cSH	816	715	1579	1453
Volume to Capacity	0.06	0.06	0.01	0.00
Queue Length 95th (m)	1.6	1.6	0.3	0.0
Control Delay (s)	9.7	10.4	0.9	0.5
Lane LOS	A	B	A	A
Approach Delay (s)	9.7	10.4	0.9	0.5
Approach LOS	A	B		

Intersection Summary	
Average Delay	3.8
Intersection Capacity Utilization	24.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	96	897	448	50	48	41
Future Volume (vph)	96	897	448	50	48	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.987			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1761	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1761	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	104	975	487	54	52	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	975	541	0	52	45
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.2%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	96	897	448	50	48	41
Future Volume (Veh/h)	96	897	448	50	48	41
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	975	487	54	52	45
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	541				1697	514
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	541				1697	514
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				43	92
cM capacity (veh/h)	1038				91	564

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	104	975	541	52	45
Volume Left	104	0	0	52	0
Volume Right	0	0	54	0	45
cSH	1038	1700	1700	91	564
Volume to Capacity	0.10	0.57	0.32	0.57	0.08
Queue Length 95th (m)	2.7	0.0	0.0	20.7	2.1
Control Delay (s)	8.9	0.0	0.0	86.9	11.9
Lane LOS	A			F	B
Approach Delay (s)	0.9		0.0	52.1	
Approach LOS				F	

Intersection Summary

Average Delay		3.5			
Intersection Capacity Utilization		57.2%		ICU Level of Service	B
Analysis Period (min)		15			

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	232	713	178	81	90	320
Future Volume (vph)	232	713	178	81	90	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.958			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1772	0	1805	1583
Flt Permitted	0.587				0.950	
Satd. Flow (perm)	1115	1863	1772	0	1805	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			55			348
Link Speed (k/h)	80	80			50	
Link Distance (m)	826.3	260.0			127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	252	775	193	88	98	348
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	775	281	0	98	348
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2021 Background

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	46.0	46.0	46.0		24.0	24.0
Total Split (%)	65.7%	65.7%	65.7%		34.3%	34.3%
Maximum Green (s)	40.0	40.0	40.0		18.0	18.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
v/c Ratio	0.40	0.73	0.27		0.21	0.52
Control Delay	10.6	16.1	6.8		21.9	6.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	10.6	16.1	6.8		21.9	6.0
LOS	B	B	A		C	A
Approach Delay		14.8	6.8		9.5	
Approach LOS		B	A		A	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 12.1
 Intersection Capacity Utilization 56.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: North Service Road & Millen Road

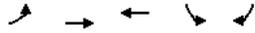


Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2021 Background

Synchro 9 Report
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Queues
 3: North Service Road & Millen Road

06-14-2018

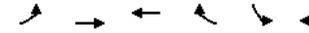


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	252	775	281	98	348
w/c Ratio	0.40	0.73	0.27	0.21	0.52
Control Delay	10.6	16.1	6.8	21.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	16.1	6.8	21.9	6.0
Queue Length 50th (m)	17.4	70.9	13.9	10.6	0.0
Queue Length 95th (m)	32.6	113.5	25.6	22.2	18.6
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	637	1064	1036	464	665
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.40	0.73	0.27	0.21	0.52

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	232	713	178	81	90	320
Future Volume (vph)	232	713	178	81	90	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Fr't	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1863	1771		1805	1583
Flt Permitted	0.59	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1116	1863	1771		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	775	193	88	98	348
RTOR Reduction (vph)	0	0	24	0	0	259
Lane Group Flow (vph)	252	775	257	0	98	89
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	40.0	40.0	40.0		18.0	18.0
Effective Green, g (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
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)	637	1064	1012		464	407
v/s Ratio Prot		c0.42	0.15		0.05	
v/s Ratio Perm	0.23					c0.06
w/c Ratio	0.40	0.73	0.25		0.21	0.22
Uniform Delay, d1	8.3	11.0	7.5		20.4	20.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	4.4	0.6		1.0	1.2
Delay (s)	10.1	15.4	8.1		21.5	21.7
Level of Service	B	B	A		C	C
Approach Delay (s)		14.1	8.1		21.7	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Appendix E

2021 Future Total Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	10	16	204	31	0	4	17	73	0	57	7
Future Volume (vph)	12	10	16	204	31	0	4	17	73	0	57	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.944						0.894			0.985	
Flt Protected		0.984			0.958			0.998				
Satd. Flow (prot)	0	1711	0	0	1820	0	0	1588	0	0	1872	0
Flt Permitted		0.984			0.958			0.998				
Satd. Flow (perm)	0	1711	0	0	1820	0	0	1588	0	0	1872	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	13	11	17	222	34	0	4	18	79	0	62	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	256	0	0	101	0	0	70	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	10	16	204	31	0	4	17	73	0	57	7
Future Volume (Veh/h)	12	10	16	204	31	0	4	17	73	0	57	7
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)	13	11	17	222	34	0	4	18	79	0	62	8
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	152	176	68	157	140	62	72			100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	152	176	68	157	140	62	72			100		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	72	95	100	100			100		
cM capacity (veh/h)	764	716	999	784	749	1006	1538			1502		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	256	101	70
Volume Left	13	222	4	0
Volume Right	17	0	79	8
cSH	830	780	1538	1502
Volume to Capacity	0.05	0.33	0.00	0.00
Queue Length 95th (m)	1.2	11.5	0.1	0.0
Control Delay (s)	9.6	11.9	0.3	0.0
Lane LOS	A	B	A	
Approach Delay (s)	9.6	11.9	0.3	0.0
Approach LOS	A	B		

Intersection Summary	
Average Delay	7.4
Intersection Capacity Utilization	35.9%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Traffic Volume (vph)	43	145	838	51	102	175
Future Volume (vph)	43	145	838	51	102	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.992			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1798	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1798	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	47	158	911	55	111	190
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	158	966	0	111	190
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

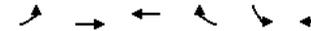
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.7%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Traffic Volume (veh/h)	43	145	838	51	102	175
Future Volume (Veh/h)	43	145	838	51	102	175
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	158	911	55	111	190
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	967				1192	940
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	967				1192	940
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	93				42	41
cM capacity (veh/h)	692				193	322

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	47	158	966	111	190
Volume Left	47	0	0	111	0
Volume Right	0	0	55	0	190
cSH	692	1700	1700	193	322
Volume to Capacity	0.07	0.09	0.57	0.58	0.59
Queue Length 95th (m)	1.7	0.0	0.0	25.0	28.4
Control Delay (s)	10.6	0.0	0.0	46.4	31.0
Lane LOS	B			E	D
Approach Delay (s)	2.4		0.0	36.7	
Approach LOS				E	

Intersection Summary

Average Delay	7.8
Intersection Capacity Utilization	64.7%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↙	↘	↗
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗
Traffic Volume (vph)	131	116	418	88	71	471
Future Volume (vph)	131	116	418	88	71	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.976			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1803	0	1504	1583
Flt Permitted	0.300				0.950	
Satd. Flow (perm)	543	1810	1803	0	1504	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			22			279
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	142	126	454	96	77	512
Shared Lane Traffic (%)						
Lane Group Flow (vph)	142	126	550	0	77	512
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2021 Total

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

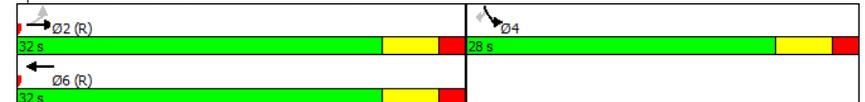
06-14-2018

	↖	→	←	↙	↘	↗
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	32.0	32.0	32.0		28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%		46.7%	46.7%
Maximum Green (s)	26.0	26.0	26.0		22.0	22.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
v/c Ratio	0.60	0.16	0.69		0.14	0.68
Control Delay	27.2	11.1	18.8		13.6	12.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	27.2	11.1	18.8		13.6	12.3
LOS	C	B	B		B	B
Approach Delay		19.6	18.8		12.4	
Approach LOS		B	B		B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 22.5 (38%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 16.3
 Intersection Capacity Utilization 67.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 3: North Service Road & Millen Road

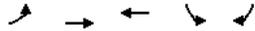


Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2021 Total

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018



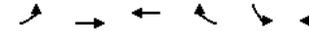
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	142	126	550	77	512
w/c Ratio	0.60	0.16	0.69	0.14	0.68
Control Delay	27.2	11.1	18.8	13.6	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	11.1	18.8	13.6	12.3
Queue Length 50th (m)	12.0	8.4	46.9	5.8	19.4
Queue Length 95th (m)	#36.7	17.4	79.7	13.6	50.8
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0		50.0		
Base Capacity (vph)	235	784	793	551	757
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.60	0.16	0.69	0.14	0.68

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↕
Traffic Volume (vph)	131	116	418	88	71	471
Future Volume (vph)	131	116	418	88	71	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1810	1803		1504	1583
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	544	1810	1803		1504	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	126	454	96	77	512
RTOR Reduction (vph)	0	0	12	0	0	177
Lane Group Flow (vph)	142	126	538	0	77	335
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	26.0	26.0	26.0		22.0	22.0
Effective Green, g (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
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)	235	784	781		551	580
w/s Ratio Prot		0.07	c0.30			0.05
w/s Ratio Perm	0.26					c0.21
w/c Ratio	0.60	0.16	0.69		0.14	0.58
Uniform Delay, d1	13.1	10.4	13.7		12.7	15.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	11.0	0.4	4.9		0.5	4.2
Delay (s)	24.1	10.8	18.6		13.2	19.4
Level of Service	C	B	B		B	B
Approach Delay (s)		17.8	18.6		18.6	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	↖
Traffic Volume (vph)	7	48	0	20	152	0
Future Volume (vph)	7	48	0	20	152	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.883					
Flt Protected					0.950	
Satd. Flow (prot)	1645	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1645	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	44.7			49.4	43.7	
Travel Time (s)	3.2			3.6	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	52	0	22	165	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	0	0	22	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	↖
Traffic Volume (veh/h)	7	48	0	20	152	0
Future Volume (Veh/h)	7	48	0	20	152	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	52	0	22	165	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			60		56	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			60		56	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		83	100
cM capacity (veh/h)			1544		952	1039

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	60	22	165
Volume Left	0	0	165
Volume Right	52	0	0
cSH	1700	1544	952
Volume to Capacity	0.04	0.00	0.17
Queue Length 95th (m)	0.0	0.0	5.0
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	6.4
Intersection Capacity Utilization	18.4%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	28	18	122	12	1	16	56	203	3	32	4
Future Volume (vph)	15	28	18	122	12	1	16	56	203	3	32	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.959			0.999			0.900			0.987	
Flt Protected		0.988			0.957			0.997			0.996	
Satd. Flow (prot)	0	1800	0	0	1768	0	0	1705	0	0	1868	0
Flt Permitted		0.988			0.957			0.997			0.996	
Satd. Flow (perm)	0	1800	0	0	1768	0	0	1705	0	0	1868	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	16	30	20	133	13	1	17	61	221	3	35	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	66	0	0	147	0	0	299	0	0	42	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	15	28	18	122	12	1	16	56	203	3	32	4
Future Volume (Veh/h)	15	28	18	122	12	1	16	56	203	3	32	4
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)	16	30	20	133	13	1	17	61	221	3	35	4
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	259	362	40	286	254	174	41			283		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259	362	40	286	254	174	41			283		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	95	98	98	98	100	99			100		
cM capacity (veh/h)	677	560	1034	617	643	874	1579			1290		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	66	147	299	42
Volume Left	16	133	17	3
Volume Right	20	1	221	4
cSH	683	620	1579	1290
Volume to Capacity	0.10	0.24	0.01	0.00
Queue Length 95th (m)	2.6	7.3	0.3	0.1
Control Delay (s)	10.8	12.6	0.5	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	10.8	12.6	0.5	0.6
Approach LOS	B	B		

Intersection Summary	
Average Delay	4.9
Intersection Capacity Utilization	40.9%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	176	897	448	100	71	101
Future Volume (vph)	176	897	448	100	71	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1746	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1746	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	191	975	487	109	77	110
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	975	596	0	77	110
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.8%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	176	897	448	100	71	101
Future Volume (Veh/h)	176	897	448	100	71	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	975	487	109	77	110
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	596				1898	542
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	596				1898	542
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				0	80
cM capacity (veh/h)	990				61	545

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	191	975	596	77	110
Volume Left	191	0	0	77	0
Volume Right	0	0	109	0	110
cSH	990	1700	1700	61	545
Volume to Capacity	0.19	0.57	0.35	1.25	0.20
Queue Length 95th (m)	5.7	0.0	0.0	51.4	6.0
Control Delay (s)	9.5	0.0	0.0	310.5	13.3
Lane LOS	A			F	B
Approach Delay (s)	1.6		0.0	135.7	
Approach LOS				F	

Intersection Summary

Average Delay	13.9
Intersection Capacity Utilization	57.8%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↙	↘	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	237	731	206	81	90	342
Future Volume (vph)	237	731	206	81	90	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1777	0	1805	1583
Flt Permitted	0.567				0.950	
Satd. Flow (perm)	1077	1863	1777	0	1805	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			47			372
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	258	795	224	88	98	372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	795	312	0	98	372
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2021 Total

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↙	↘	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	46.0	46.0	46.0		24.0	24.0
Total Split (%)	65.7%	65.7%	65.7%		34.3%	34.3%
Maximum Green (s)	40.0	40.0	40.0		18.0	18.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
v/c Ratio	0.42	0.75	0.30		0.21	0.54
Control Delay	11.1	16.8	7.4		21.9	6.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.1	16.8	7.4		21.9	6.1
LOS	B	B	A		C	A
Approach Delay		15.4	7.4		9.4	
Approach LOS		B	A		A	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 12.5
 Intersection Capacity Utilization 56.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: North Service Road & Millen Road

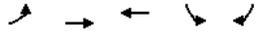


Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2021 Total

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018

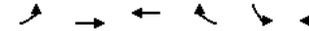


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	258	795	312	98	372
w/c Ratio	0.42	0.75	0.30	0.21	0.54
Control Delay	11.1	16.8	7.4	21.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	16.8	7.4	21.9	6.1
Queue Length 50th (m)	18.2	74.1	16.7	10.6	0.0
Queue Length 95th (m)	34.3	119.2	29.7	22.2	19.2
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	615	1064	1035	464	683
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.42	0.75	0.30	0.21	0.54

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↕
Traffic Volume (vph)	237	731	206	81	90	342
Future Volume (vph)	237	731	206	81	90	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1863	1777		1805	1583
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1077	1863	1777		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	795	224	88	98	372
RTOR Reduction (vph)	0	0	20	0	0	276
Lane Group Flow (vph)	258	795	292	0	98	96
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	40.0	40.0	40.0		18.0	18.0
Effective Green, g (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
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)	615	1064	1015		464	407
v/s Ratio Prot		c0.43	0.16		0.05	
v/s Ratio Perm	0.24					c0.06
w/c Ratio	0.42	0.75	0.29		0.21	0.24
Uniform Delay, d1	8.5	11.2	7.7		20.4	20.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	4.8	0.7		1.0	1.4
Delay (s)	10.6	16.0	8.4		21.5	21.9
Level of Service	B	B	A		C	C
Approach Delay (s)	14.7	8.4	21.8			
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	21	144	0	2	92	0
Future Volume (vph)	21	144	0	2	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.882					
Flt Protected					0.950	
Satd. Flow (prot)	1643	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1643	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	44.7			49.4	43.7	
Travel Time (s)	3.2			3.6	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	157	0	2	100	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	180	0	0	2	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	21	144	0	2	92	0
Future Volume (Veh/h)	21	144	0	2	92	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	157	0	2	100	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			180		104	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			180		104	102
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	100
cM capacity (veh/h)			1396		895	954

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	180	2	100
Volume Left	0	0	100
Volume Right	157	0	0
cSH	1700	1396	895
Volume to Capacity	0.11	0.00	0.11
Queue Length 95th (m)	0.0	0.0	3.0
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.5
Approach LOS			A

Intersection Summary

Average Delay		3.4	
Intersection Capacity Utilization	21.8%		ICU Level of Service A
Analysis Period (min)		15	

Appendix F

2023 Background Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	11	17	207	32	0	4	18	74	0	60	8
Future Volume (vph)	12	11	17	207	32	0	4	18	74	0	60	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.943						0.896			0.984	
Flt Protected		0.985			0.959			0.998				
Satd. Flow (prot)	0	1713	0	0	1822	0	0	1592	0	0	1870	0
Flt Permitted		0.985			0.959			0.998				
Satd. Flow (perm)	0	1713	0	0	1822	0	0	1592	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	13	12	18	225	35	0	4	20	80	0	65	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	260	0	0	104	0	0	74	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	11	17	207	32	0	4	18	74	0	60	8
Future Volume (Veh/h)	12	11	17	207	32	0	4	18	74	0	60	8
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)	13	12	18	225	35	0	4	20	80	0	65	9
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	158	182	72	164	147	64	76			103		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158	182	72	164	147	64	76			103		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	98	71	95	100	100		100		
cM capacity (veh/h)	756	710	995	774	743	1003	1533			1498		

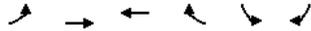
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	260	104	74
Volume Left	13	225	4	0
Volume Right	18	0	80	9
cSH	824	770	1533	1498
Volume to Capacity	0.05	0.34	0.00	0.00
Queue Length 95th (m)	1.3	12.0	0.1	0.0
Control Delay (s)	9.6	12.0	0.3	0.0
Lane LOS	A	B	A	
Approach Delay (s)	9.6	12.0	0.3	0.0
Approach LOS	A	B		

Intersection Summary	
Average Delay	7.4
Intersection Capacity Utilization	36.3%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↕	↔
Traffic Volume (vph)	44	147	863	52	104	178
Future Volume (vph)	44	147	863	52	104	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.992			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1797	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1797	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	48	160	938	57	113	193
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	160	995	0	113	193
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

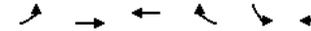
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	66.3%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↕	↔
Traffic Volume (veh/h)	44	147	863	52	104	178
Future Volume (Veh/h)	44	147	863	52	104	178
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	160	938	57	113	193
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	996				1224	968
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	996				1224	968
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	93				38	38
cM capacity (veh/h)	675				184	311

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	48	160	995	113	193
Volume Left	48	0	0	113	0
Volume Right	0	0	57	0	193
cSH	675	1700	1700	184	311
Volume to Capacity	0.07	0.09	0.59	0.62	0.62
Queue Length 95th (m)	1.8	0.0	0.0	27.6	31.1
Control Delay (s)	10.7	0.0	0.0	51.7	33.9
Lane LOS	B			F	D
Approach Delay (s)	2.5		0.0	40.4	
Approach LOS				E	

Intersection Summary

Average Delay	8.5
Intersection Capacity Utilization	66.3%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	132	119	435	91	71	480
Future Volume (vph)	132	119	435	91	71	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1805	0	1504	1583
Flt Permitted	0.279				0.950	
Satd. Flow (perm)	505	1810	1805	0	1504	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			22			263
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	143	129	473	99	77	522
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	129	572	0	77	522
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2023 Background

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

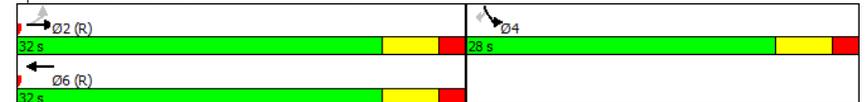
06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	32.0	32.0	32.0		28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%		46.7%	46.7%
Maximum Green (s)	26.0	26.0	26.0		22.0	22.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
v/c Ratio	0.66	0.16	0.72		0.14	0.70
Control Delay	32.0	11.1	19.9		13.6	13.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	32.0	11.1	19.9		13.6	13.7
LOS	C	B	B		B	B
Approach Delay		22.1	19.9		13.7	
Approach LOS		C	B		B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 17.7
 Intersection Capacity Utilization 68.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 3: North Service Road & Millen Road

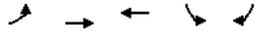


Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2023 Background

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018



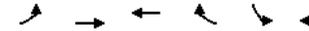
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	143	129	572	77	522
w/c Ratio	0.66	0.16	0.72	0.14	0.70
Control Delay	32.0	11.1	19.9	13.6	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	11.1	19.9	13.6	13.7
Queue Length 50th (m)	12.5	8.6	49.6	5.8	22.3
Queue Length 95th (m)	#39.0	17.8	84.3	13.6	55.6
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0		50.0		
Base Capacity (vph)	218	784	794	551	747
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.66	0.16	0.72	0.14	0.70

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Traffic Volume (vph)	132	119	435	91	71	480
Future Volume (vph)	132	119	435	91	71	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1810	1804		1504	1583
Flt Permitted	0.28	1.00	1.00		0.95	1.00
Satd. Flow (perm)	505	1810	1804		1504	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	129	473	99	77	522
RTOR Reduction (vph)	0	0	12	0	0	167
Lane Group Flow (vph)	143	129	560	0	77	355
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	26.0	26.0	26.0		22.0	22.0
Effective Green, g (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
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)	218	784	781		551	580
w/s Ratio Prot		0.07	c0.31			0.05
w/s Ratio Perm	0.28					c0.22
w/c Ratio	0.66	0.16	0.72		0.14	0.61
Uniform Delay, d1	13.5	10.4	14.0		12.7	15.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.4	0.5	5.6		0.5	4.8
Delay (s)	27.9	10.8	19.5		13.2	20.3
Level of Service	C	B	B		B	C
Approach Delay (s)	19.8	19.5	19.4		19.4	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Volume (vph)	8	48	0	21	152	0
Future Volume (vph)	8	48	0	21	152	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.885					
Flt Protected				0.950		
Satd. Flow (prot)	1649	0	0	1863	1770	0
Flt Permitted	0.950					
Satd. Flow (perm)	1649	0	0	1863	1770	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	44.7		49.4		43.7	
Travel Time (s)	3.2		3.6		3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	52	0	23	165	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	0	23	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Volume (veh/h)	8	48	0	21	152	0
Future Volume (Veh/h)	8	48	0	21	152	0
Sign Control	Free			Free	Stop	
Grade	0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	52	0	23	165	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			61		58	35
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			61		58	35
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		83	100
cM capacity (veh/h)			1542		949	1038

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	61	23	165
Volume Left	0	0	165
Volume Right	52	0	0
cSH	1700	1542	949
Volume to Capacity	0.04	0.00	0.17
Queue Length 95th (m)	0.0	0.0	5.0
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	6.4
Intersection Capacity Utilization	18.5%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	28	19	124	12	1	17	59	206	3	33	4
Future Volume (vph)	15	28	19	124	12	1	17	59	206	3	33	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.958			0.999			0.901			0.987	
Flt Protected		0.988			0.957			0.997			0.997	
Satd. Flow (prot)	0	1798	0	0	1768	0	0	1707	0	0	1870	0
Flt Permitted		0.988			0.957			0.997			0.997	
Satd. Flow (perm)	0	1798	0	0	1768	0	0	1707	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	16	30	21	135	13	1	18	64	224	3	36	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	149	0	0	306	0	0	43	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	15	28	19	124	12	1	17	59	206	3	33	4
Future Volume (Veh/h)	15	28	19	124	12	1	17	59	206	3	33	4
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)	16	30	21	135	13	1	18	64	224	3	36	4
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	266	371	41	294	261	178	42			289		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266	371	41	294	261	178	42			289		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	95	98	78	98	100	99			100		
cM capacity (veh/h)	669	553	1033	608	637	869	1577			1283		

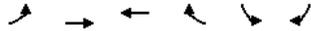
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	149	306	43
Volume Left	16	135	18	3
Volume Right	21	1	224	4
cSH	680	611	1577	1283
Volume to Capacity	0.10	0.24	0.01	0.00
Queue Length 95th (m)	2.6	7.6	0.3	0.1
Control Delay (s)	10.9	12.8	0.5	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	12.8	0.5	0.6
Approach LOS	B	B		

Intersection Summary	
Average Delay	5.0
Intersection Capacity Utilization	41.7%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (vph)	179	926	459	102	73	103
Future Volume (vph)	179	926	459	102	73	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1746	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1746	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	195	1007	499	111	79	112
Shared Lane Traffic (%)						
Lane Group Flow (vph)	195	1007	610	0	79	112
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

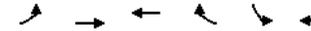
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.4%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (veh/h)	179	926	459	102	73	103
Future Volume (Veh/h)	179	926	459	102	73	103
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	195	1007	499	111	79	112
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	610				1952	554
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	610				1952	554
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				0	79
cM capacity (veh/h)	979				57	535

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	195	1007	610	79	112
Volume Left	195	0	0	79	0
Volume Right	0	0	111	0	112
cSH	979	1700	1700	57	535
Volume to Capacity	0.20	0.59	0.36	1.40	0.21
Queue Length 95th (m)	5.9	0.0	0.0	56.2	6.3
Control Delay (s)	9.6	0.0	0.0	377.3	13.5
Lane LOS	A			F	B
Approach Delay (s)	1.6		0.0	164.0	
Approach LOS				F	

Intersection Summary

Average Delay	16.6
Intersection Capacity Utilization	59.4%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	239	759	212	82	92	349
Future Volume (vph)	239	759	212	82	92	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1777	0	1805	1583
Flt Permitted	0.561				0.950	
Satd. Flow (perm)	1066	1863	1777	0	1805	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			46			379
Link Speed (k/h)	80	80			50	
Link Distance (m)	826.3	260.0			127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	260	825	230	89	100	379
Shared Lane Traffic (%)						
Lane Group Flow (vph)	260	825	319	0	100	379
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2023 Background

Synchro 9 Report
Page 5

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	46.0	46.0	46.0		24.0	24.0
Total Split (%)	65.7%	65.7%	65.7%		34.3%	34.3%
Maximum Green (s)	40.0	40.0	40.0		18.0	18.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
v/c Ratio	0.43	0.78	0.31		0.22	0.55
Control Delay	11.2	18.0	7.5		22.0	6.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.2	18.0	7.5		22.0	6.1
LOS	B	B	A		C	A
Approach Delay		16.4	7.5		9.4	
Approach LOS		B	A		A	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 13.1
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: North Service Road & Millen Road

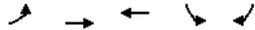


Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2023 Background

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018

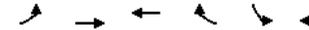


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	260	825	319	100	379
w/c Ratio	0.43	0.78	0.31	0.22	0.55
Control Delay	11.2	18.0	7.5	22.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	18.0	7.5	22.0	6.1
Queue Length 50th (m)	18.3	79.1	17.3	10.8	0.0
Queue Length 95th (m)	34.9	128.0	30.6	22.5	19.4
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	609	1064	1035	464	688
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.43	0.78	0.31	0.22	0.55

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Traffic Volume (vph)	239	759	212	82	92	349
Future Volume (vph)	239	759	212	82	92	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Fr't	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1863	1777		1805	1583
Flt Permitted	0.56	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1065	1863	1777		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	260	825	230	89	100	379
RTOR Reduction (vph)	0	0	20	0	0	282
Lane Group Flow (vph)	260	825	299	0	100	97
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	40.0	40.0	40.0		18.0	18.0
Effective Green, g (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
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)	608	1064	1015		464	407
w/s Ratio Prot		c0.44	0.17		0.06	
w/s Ratio Perm	0.24					c0.06
w/c Ratio	0.43	0.78	0.29		0.22	0.24
Uniform Delay, d1	8.5	11.5	7.7		20.4	20.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.2	5.5	0.7		1.1	1.4
Delay (s)	10.7	17.1	8.5		21.5	22.0
Level of Service	B	B	A		C	C
Approach Delay (s)		15.6	8.5		21.9	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Volume (vph)	22	144	0	2	92	0
Future Volume (vph)	22	144	0	2	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.883					
Flt Protected					0.950	
Satd. Flow (prot)	1645	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1645	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	44.7			49.4	43.7	
Travel Time (s)	3.2			3.6	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	157	0	2	100	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	181	0	0	2	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Volume (veh/h)	22	144	0	2	92	0
Future Volume (Veh/h)	22	144	0	2	92	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	157	0	2	100	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			181		104	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			181		104	102
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	100
cM capacity (veh/h)			1394		893	953

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	181	2	100
Volume Left	0	0	100
Volume Right	157	0	0
cSH	1700	1394	893
Volume to Capacity	0.11	0.00	0.11
Queue Length 95th (m)	0.0	0.0	3.0
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.5
Approach LOS			A

Intersection Summary

Average Delay		3.4	
Intersection Capacity Utilization	21.8%		ICU Level of Service A
Analysis Period (min)		15	

Appendix G

2023 Future Total Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	12	15	17	334	46	0	4	18	114	0	60	8
Future Volume (vph)	12	15	17	334	46	0	4	18	114	0	60	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.948						0.887			0.984	
Flt Protected		0.986			0.958			0.999				
Satd. Flow (prot)	0	1728	0	0	1820	0	0	1576	0	0	1870	0
Flt Permitted		0.986			0.958			0.999				
Satd. Flow (perm)	0	1728	0	0	1820	0	0	1576	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	13	16	18	363	50	0	4	20	124	0	65	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	413	0	0	148	0	0	74	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	15	17	334	46	0	4	18	114	0	60	8
Future Volume (Veh/h)	12	15	17	334	46	0	4	18	114	0	60	8
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)	13	16	18	363	50	0	4	20	124	0	65	9
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	188	226	72	188	169	86	76			147		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188	226	72	188	169	86	76			147		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	51	93	100	100			100		
cM capacity (veh/h)	710	672	995	743	723	975	1533			1444		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	47	413	148	74
Volume Left	13	363	4	0
Volume Right	18	0	124	9
cSH	781	740	1533	1444
Volume to Capacity	0.06	0.56	0.00	0.00
Queue Length 95th (m)	1.5	27.9	0.1	0.0
Control Delay (s)	9.9	15.8	0.2	0.0
Lane LOS	A	C	A	
Approach Delay (s)	9.9	15.8	0.2	0.0
Approach LOS	A	C		

Intersection Summary	
Average Delay	10.3
Intersection Capacity Utilization	46.3%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕
Traffic Volume (vph)	68	147	863	68	139	270
Future Volume (vph)	68	147	863	68	139	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1790	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1790	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	74	160	938	74	151	293
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	160	1012	0	151	293
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

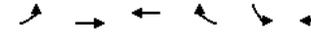
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.9%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕
Traffic Volume (veh/h)	68	147	863	68	139	270
Future Volume (Veh/h)	68	147	863	68	139	270
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	160	938	74	151	293
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1013				1284	976
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1013				1284	976
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	89				7	5
cM capacity (veh/h)	665				162	307

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	74	160	1012	151	293
Volume Left	74	0	0	151	0
Volume Right	0	0	74	0	293
cSH	665	1700	1700	162	307
Volume to Capacity	0.11	0.09	0.60	0.93	0.95
Queue Length 95th (m)	3.0	0.0	0.0	55.2	77.1
Control Delay (s)	11.1	0.0	0.0	110.5	78.1
Lane LOS	B			F	F
Approach Delay (s)	3.5		0.0	89.1	
Approach LOS				F	

Intersection Summary

Average Delay	23.9
Intersection Capacity Utilization	72.9%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	139	147	444	91	71	487
Future Volume (vph)	139	147	444	91	71	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1805	0	1504	1583
Flt Permitted	0.270				0.950	
Satd. Flow (perm)	489	1810	1805	0	1504	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			22			255
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	151	160	483	99	77	529
Shared Lane Traffic (%)						
Lane Group Flow (vph)	151	160	582	0	77	529
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2023 Total

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

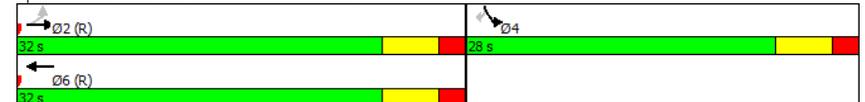
06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	32.0	32.0	32.0		28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%		46.7%	46.7%
Maximum Green (s)	26.0	26.0	26.0		22.0	22.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
v/c Ratio	0.72	0.20	0.73		0.14	0.71
Control Delay	37.5	11.5	20.5		13.6	14.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	37.5	11.5	20.5		13.6	14.7
LOS	D	B	C		B	B
Approach Delay		24.1	20.5		14.6	
Approach LOS		C	C		B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 18.8
 Intersection Capacity Utilization 69.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 3: North Service Road & Millen Road

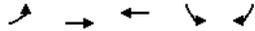


Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2023 Total

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	151	160	582	77	529
w/c Ratio	0.72	0.20	0.73	0.14	0.71
Control Delay	37.5	11.5	20.5	13.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	11.5	20.5	13.6	14.7
Queue Length 50th (m)	13.6	10.9	51.0	5.8	24.1
Queue Length 95th (m)	#42.6	21.4	#87.9	13.6	58.5
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	211	784	794	551	741
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.72	0.20	0.73	0.14	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
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	139	147	444	91	71	487
Future Volume (vph)	139	147	444	91	71	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1810	1805		1504	1583
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	488	1810	1805		1504	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	151	160	483	99	77	529
RTOR Reduction (vph)	0	0	12	0	0	162
Lane Group Flow (vph)	151	160	570		77	368
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	26.0	26.0	26.0		22.0	22.0
Effective Green, g (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
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)	211	784	782		551	580
w/s Ratio Prot		0.09	c0.32			0.05
w/s Ratio Perm	0.31					c0.23
v/c Ratio	0.72	0.20	0.73		0.14	0.63
Uniform Delay, d1	14.0	10.6	14.1		12.7	15.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	18.7	0.6	5.9		0.5	5.2
Delay (s)	32.7	11.2	20.0		13.2	20.9
Level of Service	C	B	B		B	C
Approach Delay (s)		21.6	20.0		19.9	
Approach LOS		C	B		B	

Intersection Summary

HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	8	48	0	21	152	0
Future Volume (vph)	8	48	0	21	152	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.885					
Flt Protected					0.950	
Satd. Flow (prot)	1649	0	0	1863	1770	0
Flt Permitted	0.950					
Satd. Flow (perm)	1649	0	0	1863	1770	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	44.7		49.4		43.7	
Travel Time (s)	3.2		3.6		3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	52	0	23	165	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	0	23	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	8	48	0	21	152	0
Future Volume (Veh/h)	8	48	0	21	152	0
Sign Control	Free			Free	Stop	
Grade	0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	52	0	23	165	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			61		58 35	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			61		58 35	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			100		83 100	
cM capacity (veh/h)			1542		949 1038	

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	61	23	165
Volume Left	0	0	165
Volume Right	52	0	0
cSH	1700	1542	949
Volume to Capacity	0.04	0.00	0.17
Queue Length 95th (m)	0.0	0.0	5.0
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	6.4
Intersection Capacity Utilization	18.5%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	56	22	0	173	0	71	0	0	0	0	21
Future Volume (vph)	9	56	22	0	173	0	71	0	0	0	0	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.966									0.865	
Flt Protected		0.995						0.950				
Satd. Flow (prot)	0	1790	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.995						0.950				
Satd. Flow (perm)	0	1790	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.8			44.7			33.3			43.2	
Travel Time (s)		3.9			3.2			2.4			3.1	
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
Adj. Flow (vph)	10	61	24	0	188	0	77	0	0	0	0	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	188	0	0	77	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	9	56	22	0	173	0	71	0	0	0	0	21
Future Volume (Veh/h)	9	56	22	0	173	0	71	0	0	0	0	21
Sign Control		Free			Free			Stop			Stop	
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)	10	61	24	0	188	0	77	0	0	0	0	23
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	188			85			304	281	73	281	293	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			85			304	281	73	281	293	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			88	100	100	100	100	97
cM capacity (veh/h)	1386			1512			627	623	989	668	613	854

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	95	188	77	23
Volume Left	10	0	77	0
Volume Right	24	0	0	23
cSH	1386	1512	627	854
Volume to Capacity	0.01	0.00	0.12	0.03
Queue Length 95th (m)	0.2	0.0	3.3	0.7
Control Delay (s)	0.9	0.0	11.5	9.3
Lane LOS	A		B	A
Approach Delay (s)	0.9	0.0	11.5	9.3
Approach LOS			B	A

Intersection Summary

Average Delay		3.1	
Intersection Capacity Utilization	29.4%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
 6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	19	87	22	0	265	0	70	0	0	0	0	42
Future Volume (vph)	19	87	22	0	265	0	70	0	0	0	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.977									0.865	
Flt Protected		0.993						0.950				
Satd. Flow (prot)	0	1807	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.993						0.950				
Satd. Flow (perm)	0	1807	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.9			53.8			33.6			37.9	
Travel Time (s)		2.8			3.9			2.4			2.7	
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
Adj. Flow (vph)	21	95	24	0	288	0	76	0	0	0	0	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	288	0	0	76	0	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	19	87	22	0	265	0	70	0	0	0	0	42
Future Volume (Veh/h)	19	87	22	0	265	0	70	0	0	0	0	42
Sign Control		Free			Free			Stop			Stop	
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)	21	95	24	0	288	0	76	0	0	0	0	46
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	288			119			483	437	107	437	449	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	288			119			483	437	107	437	449	288
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			83	100	100	100	100	94
cM capacity (veh/h)	1274			1469			458	505	947	523	497	751

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	140	288	76	46
Volume Left	21	0	76	0
Volume Right	24	0	0	46
cSH	1274	1469	458	751
Volume to Capacity	0.02	0.00	0.17	0.06
Queue Length 95th (m)	0.4	0.0	4.7	1.6
Control Delay (s)	1.3	0.0	14.4	10.1
Lane LOS	A		B	B
Approach Delay (s)	1.3	0.0	14.4	10.1
Approach LOS			B	B

Intersection Summary

Average Delay	3.2
Intersection Capacity Utilization	39.7%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	41	19	200	21	1	17	59	326	3	33	4
Future Volume (vph)	15	41	19	200	21	1	17	59	326	3	33	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.965			0.999			0.890			0.987	
Flt Protected		0.990			0.957			0.998			0.997	
Satd. Flow (prot)	0	1815	0	0	1769	0	0	1688	0	0	1870	0
Flt Permitted		0.990			0.957			0.998			0.997	
Satd. Flow (perm)	0	1815	0	0	1769	0	0	1688	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	16	45	21	217	23	1	18	64	354	3	36	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	82	0	0	241	0	0	436	0	0	43	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	15	41	19	200	21	1	17	59	326	3	33	4
Future Volume (Veh/h)	15	41	19	200	21	1	17	59	326	3	33	4
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)	16	45	21	217	23	1	18	64	354	3	36	4
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	336	501	41	366	326	243	42			419		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	336	501	41	366	326	243	42			419		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	90	98	59	96	100	99			100		
cM capacity (veh/h)	593	467	1033	526	586	799	1577			1150		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	82	241	436	43
Volume Left	16	217	18	3
Volume Right	21	1	354	4
cSH	571	532	1577	1150
Volume to Capacity	0.14	0.45	0.01	0.00
Queue Length 95th (m)	4.0	18.7	0.3	0.1
Control Delay (s)	12.4	17.3	0.4	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	12.4	17.3	0.4	0.6
Approach LOS	B	C		

Intersection Summary	
Average Delay	6.7
Intersection Capacity Utilization	53.7%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↙	↘	↗
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗
Traffic Volume (vph)	252	926	459	149	94	158
Future Volume (vph)	252	926	459	149	94	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1737	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1737	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	274	1007	499	162	102	172
Shared Lane Traffic (%)						
Lane Group Flow (vph)	274	1007	661	0	102	172
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.4%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↙	↘	↗
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗
Traffic Volume (veh/h)	252	926	459	149	94	158
Future Volume (Veh/h)	252	926	459	149	94	158
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	274	1007	499	162	102	172
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	661				2135	580
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	661				2135	580
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	71				0	67
cM capacity (veh/h)	937				38	518

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	274	1007	661	102	172
Volume Left	274	0	0	102	0
Volume Right	0	0	162	0	172
cSH	937	1700	1700	38	518
Volume to Capacity	0.29	0.59	0.39	2.66	0.33
Queue Length 95th (m)	9.8	0.0	0.0	90.7	11.5
Control Delay (s)	10.4	0.0	0.0	975.9	15.4
Lane LOS	B			F	C
Approach Delay (s)	2.2		0.0	373.0	
Approach LOS				F	

Intersection Summary	
Average Delay	47.4
Intersection Capacity Utilization	62.4%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↙	↘	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	243	776	239	82	92	369
Future Volume (vph)	243	776	239	82	92	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.966			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1782	0	1805	1583
Flt Permitted	0.535				0.950	
Satd. Flow (perm)	1016	1863	1782	0	1805	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			41			401
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	264	843	260	89	100	401
Shared Lane Traffic (%)						
Lane Group Flow (vph)	264	843	349	0	100	401
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2023 Total

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↙	↘	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	46.0	46.0	46.0		24.0	24.0
Total Split (%)	65.7%	65.7%	65.7%		34.3%	34.3%
Maximum Green (s)	40.0	40.0	40.0		18.0	18.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
v/c Ratio	0.46	0.79	0.34		0.22	0.57
Control Delay	11.9	18.9	8.0		22.0	6.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	11.9	18.9	8.0		22.0	6.2
LOS	B	B	A		C	A
Approach Delay		17.2	8.0		9.3	
Approach LOS		B	A		A	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 13.6
 Intersection Capacity Utilization 59.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: North Service Road & Millen Road

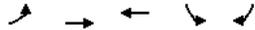


Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2023 Total

Synchro 9 Report
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Queues
 3: North Service Road & Millen Road

06-14-2018



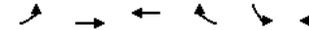
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	264	843	349	100	401
w/c Ratio	0.46	0.79	0.34	0.22	0.57
Control Delay	11.9	18.9	8.0	22.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	18.9	8.0	22.0	6.2
Queue Length 50th (m)	19.0	82.2	19.9	10.8	0.0
Queue Length 95th (m)	36.7	#134.4	34.5	22.5	19.7
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	580	1064	1035	464	704
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.46	0.79	0.34	0.22	0.57

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↕
Traffic Volume (vph)	243	776	239	82	92	369
Future Volume (vph)	243	776	239	82	92	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1863	1782		1805	1583
Flt Permitted	0.53	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1016	1863	1782		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	264	843	260	89	100	401
RTOR Reduction (vph)	0	0	18	0	0	298
Lane Group Flow (vph)	264	843	331	0	100	103
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	40.0	40.0	40.0		18.0	18.0
Effective Green, g (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
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)	580	1064	1018		464	407
v/s Ratio Prot		c0.45	0.19		0.06	
v/s Ratio Perm	0.26					c0.07
w/c Ratio	0.46	0.79	0.33		0.22	0.25
Uniform Delay, d1	8.7	11.7	7.9		20.4	20.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	6.1	0.9		1.1	1.5
Delay (s)	11.3	17.8	8.7		21.5	22.2
Level of Service	B	B	A		C	C
Approach Delay (s)		16.2	8.7		22.0	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	22	144	0	2	92	0
Future Volume (vph)	22	144	0	2	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.883					
Flt Protected					0.950	
Satd. Flow (prot)	1645	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1645	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	44.7			49.4	43.7	
Travel Time (s)	3.2			3.6	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	157	0	2	100	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	181	0	0	2	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	22	144	0	2	92	0
Future Volume (Veh/h)	22	144	0	2	92	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	157	0	2	100	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			181		104	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			181		104	102
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	100
cM capacity (veh/h)			1394		893	953

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	181	2	100
Volume Left	0	0	100
Volume Right	157	0	0
cSH	1700	1394	893
Volume to Capacity	0.11	0.00	0.11
Queue Length 95th (m)	0.0	0.0	3.0
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.5
Approach LOS			A

Intersection Summary

Average Delay		3.4	
Intersection Capacity Utilization	21.8%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	28	94	67	0	94	0	43	0	0	0	0	3
Future Volume (vph)	28	94	67	0	94	0	43	0	0	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.952									0.865	
Flt Protected		0.993						0.950				
Satd. Flow (prot)	0	1761	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.993						0.950				
Satd. Flow (perm)	0	1761	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.8			44.7			33.3			48.0	
Travel Time (s)		3.9			3.2			2.4			3.5	
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
Adj. Flow (vph)	30	102	73	0	102	0	47	0	0	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	205	0	0	102	0	0	47	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	28	94	67	0	94	0	43	0	0	0	0	3
Future Volume (Veh/h)	28	94	67	0	94	0	43	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
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)	30	102	73	0	102	0	47	0	0	0	0	3
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	102				175			304	300	138	300	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102				175			304	300	138	300	102
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	98				100			93	100	100	100	100
cM capacity (veh/h)	1490				1401			637	600	910	642	953

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	205	102	47	3
Volume Left	30	0	47	0
Volume Right	73	0	0	3
cSH	1490	1401	637	953
Volume to Capacity	0.02	0.00	0.07	0.00
Queue Length 95th (m)	0.5	0.0	1.9	0.1
Control Delay (s)	1.2	0.0	11.1	8.8
Lane LOS	A		B	A
Approach Delay (s)	1.2	0.0	11.1	8.8
Approach LOS			B	A

Intersection Summary	
Average Delay	2.2
Intersection Capacity Utilization	33.0%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	42	261	66	0	141	0	42	0	0	0	0	35
Future Volume (vph)	42	261	66	0	141	0	42	0	0	0	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.976									0.865	
Flt Protected		0.994						0.950				
Satd. Flow (prot)	0	1807	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.994						0.950				
Satd. Flow (perm)	0	1807	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.9			53.8			33.6			40.8	
Travel Time (s)		2.8			3.9			2.4			2.9	
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
Adj. Flow (vph)	46	284	72	0	153	0	46	0	0	0	0	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	0	0	153	0	0	46	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	42	261	66	0	141	0	42	0	0	0	0	35
Future Volume (Veh/h)	42	261	66	0	141	0	42	0	0	0	0	35
Sign Control		Free			Free			Stop			Stop	
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)	46	284	72	0	153	0	46	0	0	0	0	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	153			356			603	565	320	565	601	153
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	153			356			603	565	320	565	601	153
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			88	100	100	100	100	96
cM capacity (veh/h)	1428			1203			384	420	721	425	401	893

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	402	153	46	38
Volume Left	46	0	46	0
Volume Right	72	0	0	38
cSH	1428	1203	384	893
Volume to Capacity	0.03	0.00	0.12	0.04
Queue Length 95th (m)	0.8	0.0	3.2	1.1
Control Delay (s)	1.1	0.0	15.7	9.2
Lane LOS	A		C	A
Approach Delay (s)	1.1	0.0	15.7	9.2
Approach LOS			C	A

Intersection Summary

Average Delay	2.4
Intersection Capacity Utilization	46.5%
ICU Level of Service	A
Analysis Period (min)	15

Appendix H

2025 Background Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	13	15	17	336	46	0	5	18	115	0	62	8
Future Volume (vph)	13	15	17	336	46	0	5	18	115	0	62	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.949						0.887			0.984	
Flt Protected		0.986			0.958			0.998				
Satd. Flow (prot)	0	1727	0	0	1820	0	0	1575	0	0	1870	0
Flt Permitted		0.986			0.958			0.998				
Satd. Flow (perm)	0	1727	0	0	1820	0	0	1575	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	14	16	18	365	50	0	5	20	125	0	67	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	0	0	415	0	0	150	0	0	76	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	13	15	17	336	46	0	5	18	115	0	62	8
Future Volume (Veh/h)	13	15	17	336	46	0	5	18	115	0	62	8
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)	14	16	18	365	50	0	5	20	125	0	67	9
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	192	232	74	193	174	86	78			148		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192	232	74	193	174	86	78			148		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	98	93	100	100			100		
cM capacity (veh/h)	705	667	992	737	718	974	1531			1442		

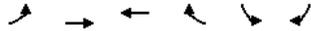
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	415	150	76
Volume Left	14	365	5	0
Volume Right	18	0	125	9
cSH	774	735	1531	1442
Volume to Capacity	0.06	0.56	0.00	0.00
Queue Length 95th (m)	1.6	28.6	0.1	0.0
Control Delay (s)	10.0	16.1	0.3	0.0
Lane LOS	A	C	A	
Approach Delay (s)	10.0	16.1	0.3	0.0
Approach LOS	A	C		

Intersection Summary	
Average Delay	10.4
Intersection Capacity Utilization	47.3%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↕	↔
Traffic Volume (vph)	68	149	888	70	142	274
Future Volume (vph)	68	149	888	70	142	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1790	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1790	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	74	162	965	76	154	298
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	162	1041	0	154	298
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	74.6%
Analysis Period (min)	15
	ICU Level of Service D

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↕	↔
Traffic Volume (veh/h)	68	149	888	70	142	274
Future Volume (Veh/h)	68	149	888	70	142	274
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	162	965	76	154	298
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1042				1314	1004
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1042				1314	1004
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	89				0	0
cM capacity (veh/h)	648				154	296

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	74	162	1041	154	298
Volume Left	74	0	0	154	0
Volume Right	0	0	76	0	298
cSH	648	1700	1700	154	296
Volume to Capacity	0.11	0.10	0.61	1.00	1.01
Queue Length 95th (m)	3.1	0.0	0.0	60.6	85.6
Control Delay (s)	11.3	0.0	0.0	130.0	93.1
Lane LOS	B			F	F
Approach Delay (s)	3.5		0.0	105.6	
Approach LOS				F	

Intersection Summary

Average Delay	28.1
Intersection Capacity Utilization	74.6%
Analysis Period (min)	15
	ICU Level of Service D

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	140	151	461	93	72	497
Future Volume (vph)	140	151	461	93	72	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1805	0	1504	1583
Flt Permitted	0.251				0.950	
Satd. Flow (perm)	454	1810	1805	0	1504	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			242
Link Speed (k/h)	80	80			50	
Link Distance (m)	826.3	260.0			127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	152	164	501	101	78	540
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	164	602	0	78	540
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2025 Background

Synchro 9 Report
Page 5

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	32.0	32.0	32.0		28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%		46.7%	46.7%
Maximum Green (s)	26.0	26.0	26.0		22.0	22.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
v/c Ratio	0.78	0.21	0.76		0.14	0.74
Control Delay	45.7	11.5	21.8		13.6	16.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	45.7	11.5	21.8		13.6	16.4
LOS	D	B	C		B	B
Approach Delay		28.0	21.8		16.0	
Approach LOS		C	C		B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 20.7
 Intersection Capacity Utilization 70.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 3: North Service Road & Millen Road

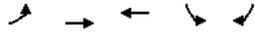


Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2025 Background

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018



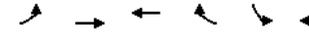
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	152	164	602	78	540
w/c Ratio	0.78	0.21	0.76	0.14	0.74
Control Delay	45.7	11.5	21.8	13.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	11.5	21.8	13.6	16.4
Queue Length 50th (m)	14.2	11.2	53.9	5.9	27.3
Queue Length 95th (m)	#44.8	21.9	#105.0	13.8	#67.6
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0		50.0		
Base Capacity (vph)	196	784	794	551	733
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.78	0.21	0.76	0.14	0.74

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↕
Traffic Volume (vph)	140	151	461	93	72	497
Future Volume (vph)	140	151	461	93	72	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Fr't	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1810	1806		1504	1583
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	454	1810	1806		1504	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	164	501	101	78	540
RTOR Reduction (vph)	0	0	12	0	0	153
Lane Group Flow (vph)	152	164	590	0	78	387
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	26.0	26.0	26.0		22.0	22.0
Effective Green, g (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
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)	196	784	782		551	580
w/s Ratio Prot		0.09	0.33		0.05	
w/s Ratio Perm	c0.34					c0.24
w/c Ratio	0.78	0.21	0.75		0.14	0.67
Uniform Delay, d1	14.5	10.6	14.3		12.7	15.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	25.4	0.6	6.7		0.5	6.0
Delay (s)	39.9	11.2	21.0		13.2	21.9
Level of Service	D	B	C		B	C
Approach Delay (s)		25.0	21.0		20.8	
Approach LOS		C	C		C	

Intersection Summary

HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Volume (vph)	8	48	0	22	152	0
Future Volume (vph)	8	48	0	22	152	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.885					
Flt Protected				0.950		
Satd. Flow (prot)	1649	0	0	1863	1770	0
Flt Permitted	0.950					
Satd. Flow (perm)	1649	0	0	1863	1770	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	44.7		49.4		43.7	
Travel Time (s)	3.2		3.6		3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	52	0	24	165	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	0	24	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free			Free Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Volume (veh/h)	8	48	0	22	152	0
Future Volume (Veh/h)	8	48	0	22	152	0
Sign Control	Free			Free Stop		
Grade	0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	52	0	24	165	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			61		59 35	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			61		59 35	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			100		83 100	
cM capacity (veh/h)			1542		948 1038	

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	61	24	165
Volume Left	0	0	165
Volume Right	52	0	0
cSH	1700	1542	948
Volume to Capacity	0.04	0.00	0.17
Queue Length 95th (m)	0.0	0.0	5.0
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	6.3		
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	56	22	0	174	0	71	0	0	0	0	22
Future Volume (vph)	9	56	22	0	174	0	71	0	0	0	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.966									0.865	
Flt Protected		0.995						0.950				
Satd. Flow (prot)	0	1790	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.995						0.950				
Satd. Flow (perm)	0	1790	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.8			44.7			33.3			43.2	
Travel Time (s)		3.9			3.2			2.4			3.1	
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
Adj. Flow (vph)	10	61	24	0	189	0	77	0	0	0	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	189	0	0	77	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	9	56	22	0	174	0	71	0	0	0	0	22
Future Volume (Veh/h)	9	56	22	0	174	0	71	0	0	0	0	22
Sign Control		Free			Free			Stop			Stop	
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)	10	61	24	0	189	0	77	0	0	0	0	24
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	189			85			306	282	73	282	294	189
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189			85			306	282	73	282	294	189
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			88	100	100	100	100	97
cM capacity (veh/h)	1385			1512			625	622	989	667	613	853

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	95	189	77	24
Volume Left	10	0	77	0
Volume Right	24	0	0	24
cSH	1385	1512	625	853
Volume to Capacity	0.01	0.00	0.12	0.03
Queue Length 95th (m)	0.2	0.0	3.4	0.7
Control Delay (s)	0.9	0.0	11.6	9.3
Lane LOS	A		B	A
Approach Delay (s)	0.9	0.0	11.6	9.3
Approach LOS			B	A

Intersection Summary

Average Delay	3.1
Intersection Capacity Utilization	29.4%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	20	87	22	0	267	0	70	0	0	0	0	44
Future Volume (vph)	20	87	22	0	267	0	70	0	0	0	0	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.977									0.865	
Flt Protected		0.992						0.950				
Satd. Flow (prot)	0	1805	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.992						0.950				
Satd. Flow (perm)	0	1805	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.9			53.8			33.6			37.9	
Travel Time (s)		2.8			3.9			2.4			2.7	
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
Adj. Flow (vph)	22	95	24	0	290	0	76	0	0	0	0	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	141	0	0	290	0	0	76	0	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	20	87	22	0	267	0	70	0	0	0	0	44
Future Volume (Veh/h)	20	87	22	0	267	0	70	0	0	0	0	44
Sign Control		Free			Free			Stop			Stop	
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)	22	95	24	0	290	0	76	0	0	0	0	48
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	290			119			489	441	107	441	453	290
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290			119			489	441	107	441	453	290
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			83	100	100	100	100	94
cM capacity (veh/h)	1272			1469			452	502	947	520	494	749

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	141	290	76	48
Volume Left	22	0	76	0
Volume Right	24	0	0	48
cSH	1272	1469	452	749
Volume to Capacity	0.02	0.00	0.17	0.06
Queue Length 95th (m)	0.4	0.0	4.8	1.6
Control Delay (s)	1.4	0.0	14.6	10.1
Lane LOS	A		B	B
Approach Delay (s)	1.4	0.0	14.6	10.1
Approach LOS			B	B

Intersection Summary

Average Delay	3.2
Intersection Capacity Utilization	40.6%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	16	42	20	202	21	1	17	61	329	3	34	5
Future Volume (vph)	16	42	20	202	21	1	17	61	329	3	34	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.965			0.999			0.891			0.985	
Flt Protected		0.990			0.957			0.998			0.997	
Satd. Flow (prot)	0	1815	0	0	1769	0	0	1690	0	0	1866	0
Flt Permitted		0.990			0.957			0.998			0.997	
Satd. Flow (perm)	0	1815	0	0	1769	0	0	1690	0	0	1866	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	17	46	22	220	23	1	18	66	358	3	37	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	244	0	0	442	0	0	45	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	16	42	20	202	21	1	17	61	329	3	34	5
Future Volume (Veh/h)	16	42	20	202	21	1	17	61	329	3	34	5
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)	17	46	22	220	23	1	18	66	358	3	37	5
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	342	508	42	374	332	247	44			425		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	342	508	42	374	332	247	44			425		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	90	98	58	96	100	99			100		
cM capacity (veh/h)	588	463	1031	519	581	795	1575			1144		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	85	244	442	45
Volume Left	17	220	18	3
Volume Right	22	1	358	5
cSH	568	525	1575	1144
Volume to Capacity	0.15	0.47	0.01	0.00
Queue Length 95th (m)	4.2	19.5	0.3	0.1
Control Delay (s)	12.5	17.7	0.4	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	12.5	17.7	0.4	0.6
Approach LOS	B	C		

Intersection Summary	
Average Delay	6.8
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	256	956	471	151	96	160
Future Volume (vph)	256	956	471	151	96	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1737	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1737	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	278	1039	512	164	104	174
Shared Lane Traffic (%)						
Lane Group Flow (vph)	278	1039	676	0	104	174
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.5%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	256	956	471	151	96	160
Future Volume (Veh/h)	256	956	471	151	96	160
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	278	1039	512	164	104	174
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		676			2189	594
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		676			2189	594
tC, single (s)		4.1			6.4	6.2
tC, 2 stage (s)						
tF (s)		2.2			3.5	3.3
p0 queue free %		70			0	66
cM capacity (veh/h)		925			35	509

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	278	1039	676	104	174
Volume Left	278	0	0	104	0
Volume Right	0	0	164	0	174
cSH	925	1700	1700	35	509
Volume to Capacity	0.30	0.61	0.40	2.97	0.34
Queue Length 95th (m)	10.2	0.0	0.0	95.2	12.0
Control Delay (s)	10.6	0.0	0.0	1129.6	15.7
Lane LOS	B			F	C
Approach Delay (s)	2.2		0.0	432.4	
Approach LOS				F	

Intersection Summary

Average Delay	54.2
Intersection Capacity Utilization	63.5%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	246	806	246	83	94	376
Future Volume (vph)	246	806	246	83	94	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.966			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1782	0	1805	1583
Flt Permitted	0.528				0.950	
Satd. Flow (perm)	1003	1863	1782	0	1805	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			40			409
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	267	876	267	90	102	409
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	876	357	0	102	409
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

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Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	46.0	46.0	46.0		24.0	24.0
Total Split (%)	65.7%	65.7%	65.7%		34.3%	34.3%
Maximum Green (s)	40.0	40.0	40.0		18.0	18.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
v/c Ratio	0.47	0.82	0.34		0.22	0.58
Control Delay	12.1	20.7	8.1		22.0	6.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	12.1	20.7	8.1		22.0	6.2
LOS	B	C	A		C	A
Approach Delay		18.7	8.1		9.4	
Approach LOS		B	A		A	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 14.5
 Intersection Capacity Utilization 60.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: North Service Road & Millen Road

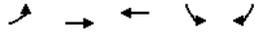


Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2025 Background

Synchro 9 Report
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Queues
 3: North Service Road & Millen Road

06-14-2018



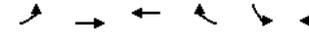
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	267	876	357	102	409
w/c Ratio	0.47	0.82	0.34	0.22	0.58
Control Delay	12.1	20.7	8.1	22.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	20.7	8.1	22.0	6.2
Queue Length 50th (m)	19.5	88.3	20.6	11.1	0.0
Queue Length 95th (m)	37.6	#167.6	35.6	22.9	20.0
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0		50.0		
Base Capacity (vph)	573	1064	1035	464	710
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.47	0.82	0.34	0.22	0.58

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	246	806	246	83	94	376
Future Volume (vph)	246	806	246	83	94	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Fr't	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1863	1782		1805	1583
Flt Permitted	0.53	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1004	1863	1782		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	876	267	90	102	409
RTOR Reduction (vph)	0	0	17	0	0	304
Lane Group Flow (vph)	267	876	340	0	102	105
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	40.0	40.0	40.0		18.0	18.0
Effective Green, g (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
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)	573	1064	1018		464	407
w/s Ratio Prot		c0.47	0.19		0.06	
w/s Ratio Perm	0.27					c0.07
w/c Ratio	0.47	0.82	0.33		0.22	0.26
Uniform Delay, d1	8.8	12.1	7.9		20.5	20.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.7	7.2	0.9		1.1	1.5
Delay (s)	11.5	19.4	8.8		21.6	22.2
Level of Service	B	B	A		C	C
Approach Delay (s)		17.5	8.8		22.1	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↘	↘
Traffic Volume (vph)	23	144	0	2	92	0
Future Volume (vph)	23	144	0	2	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.884					
Flt Protected					0.950	
Satd. Flow (prot)	1647	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1647	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	44.7			49.4	43.7	
Travel Time (s)	3.2			3.6	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	157	0	2	100	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	182	0	0	2	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↘	↘
Traffic Volume (veh/h)	23	144	0	2	92	0
Future Volume (Veh/h)	23	144	0	2	92	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	157	0	2	100	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			182		106	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			182		106	104
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	100
cM capacity (veh/h)			1393		892	951

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	182	2	100
Volume Left	0	0	100
Volume Right	157	0	0
cSH	1700	1393	892
Volume to Capacity	0.11	0.00	0.11
Queue Length 95th (m)	0.0	0.0	3.0
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.5
Approach LOS			A

Intersection Summary

Average Delay	3.4
Intersection Capacity Utilization	21.9%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	29	95	67	0	94	0	43	0	0	0	0	3
Future Volume (vph)	29	95	67	0	94	0	43	0	0	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.953									0.865	
Flt Protected		0.992						0.950				
Satd. Flow (prot)	0	1761	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.992						0.950				
Satd. Flow (perm)	0	1761	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.8			44.7			33.3			48.0	
Travel Time (s)		3.9			3.2			2.4			3.5	
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
Adj. Flow (vph)	32	103	73	0	102	0	47	0	0	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	102	0	0	47	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	29	95	67	0	94	0	43	0	0	0	0	3
Future Volume (Veh/h)	29	95	67	0	94	0	43	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
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)	32	103	73	0	102	0	47	0	0	0	0	3
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	102				176			308	306	140	306	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102				176			308	306	140	306	102
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	98				100			93	100	100	100	100
cM capacity (veh/h)	1490				1400			631	595	909	636	953

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	208	102	47	3
Volume Left	32	0	47	0
Volume Right	73	0	0	3
cSH	1490	1400	631	953
Volume to Capacity	0.02	0.00	0.07	0.00
Queue Length 95th (m)	0.5	0.0	1.9	0.1
Control Delay (s)	1.3	0.0	11.2	8.8
Lane LOS	A		B	A
Approach Delay (s)	1.3	0.0	11.2	8.8
Approach LOS			B	A

Intersection Summary	
Average Delay	2.3
Intersection Capacity Utilization	33.1%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Volume (vph)	44	263	66	0	141	0	42	0	0	0	0	37
Future Volume (vph)	44	263	66	0	141	0	42	0	0	0	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt	0.976						0.865					
Flt Protected	0.994						0.950					
Satd. Flow (prot)	0	1807	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted	0.994						0.950					
Satd. Flow (perm)	0	1807	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)	50				50		50				50	
Link Distance (m)	38.9				53.8		33.6				40.8	
Travel Time (s)	2.8				3.9		2.4				2.9	
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
Adj. Flow (vph)	48	286	72	0	153	0	46	0	0	0	0	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	406	0	0	153	0	0	46	0	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0		0.0				0.0	
Link Offset(m)	0.0				0.0		0.0				0.0	
Crosswalk Width(m)	4.8				4.8		4.8				4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Free				Free		Stop				Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↕			↕			↕			↕			
Traffic Volume (veh/h)	44	263	66	0	141	0	42	0	0	0	0	37	
Future Volume (Veh/h)	44	263	66	0	141	0	42	0	0	0	0	37	
Sign Control	Free				Free		Stop				Stop		
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)	48	286	72	0	153	0	46	0	0	0	0	40	
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	153			358				611	571	322	571	607	153
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	153			358				611	571	322	571	607	153
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100				88	100	100	100	100	96
cM capacity (veh/h)	1428			1201				378	416	719	421	397	893

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	406	153	46	40
Volume Left	48	0	46	0
Volume Right	72	0	0	40
cSH	1428	1201	378	893
Volume to Capacity	0.03	0.00	0.12	0.04
Queue Length 95th (m)	0.8	0.0	3.3	1.1
Control Delay (s)	1.2	0.0	15.8	9.2
Lane LOS	A		C	A
Approach Delay (s)	1.2	0.0	15.8	9.2
Approach LOS			C	A

Intersection Summary

Average Delay	2.4
Intersection Capacity Utilization	46.7%
ICU Level of Service	A
Analysis Period (min)	15

Appendix I

2025 Future Total Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	13	19	17	452	59	0	5	18	153	0	62	8
Future Volume (vph)	13	19	17	452	59	0	5	18	153	0	62	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.954						0.883			0.984	
Flt Protected		0.987			0.958			0.999				
Satd. Flow (prot)	0	1743	0	0	1820	0	0	1569	0	0	1870	0
Flt Permitted		0.987			0.958			0.999				
Satd. Flow (perm)	0	1743	0	0	1820	0	0	1569	0	0	1870	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	14	21	18	491	64	0	5	20	166	0	67	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	0	555	0	0	191	0	0	76	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.7%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	13	19	17	452	59	0	5	18	153	0	62	8
Future Volume (Veh/h)	13	19	17	452	59	0	5	18	153	0	62	8
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)	14	21	18	491	64	0	5	20	166	0	67	9
Pedestrians		2			3						1	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	220	272	74	216	194	107	78			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220	272	74	216	194	107	78			189		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	97	98	31	91	100	100			100		
cM capacity (veh/h)	664	633	992	707	700	949	1531			1394		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	53	555	191	76
Volume Left	14	491	5	0
Volume Right	18	0	166	9
cSH	732	706	1531	1394
Volume to Capacity	0.07	0.79	0.00	0.00
Queue Length 95th (m)	1.9	62.4	0.1	0.0
Control Delay (s)	10.3	26.1	0.2	0.0
Lane LOS	B	D	A	
Approach Delay (s)	10.3	26.1	0.2	0.0
Approach LOS	B	D		

Intersection Summary	
Average Delay	17.3
Intersection Capacity Utilization	56.7%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
 2: North Service Road & Green Road

06-14-2018

	↖	→	←	↙	↘	↗
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↙		↘	↗
Traffic Volume (vph)	92	149	888	84	174	358
Future Volume (vph)	92	149	888	84	174	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.988			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1783	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	1696	1783	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	100	162	965	91	189	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	162	1056	0	189	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	80.7%
Analysis Period (min)	15
	ICU Level of Service D

HCM Unsignalized Intersection Capacity Analysis
 2: North Service Road & Green Road

06-14-2018

	↖	→	←	↙	↘	↗
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↙		↘	↗
Traffic Volume (veh/h)	92	149	888	84	174	358
Future Volume (Veh/h)	92	149	888	84	174	358
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	162	965	91	189	389
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1057				1374	1012
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1057				1374	1012
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	84				0	0
cM capacity (veh/h)	640				135	293

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	100	162	1056	189	389
Volume Left	100	0	0	189	0
Volume Right	0	0	91	0	389
cSH	640	1700	1700	135	293
Volume to Capacity	0.16	0.10	0.62	1.40	1.33
Queue Length 95th (m)	4.4	0.0	0.0	99.3	155.9
Control Delay (s)	11.7	0.0	0.0	278.0	204.2
Lane LOS	B			F	F
Approach Delay (s)	4.5		0.0	228.3	
Approach LOS				F	

Intersection Summary	
Average Delay	70.2
Intersection Capacity Utilization	80.7%
Analysis Period (min)	15
	ICU Level of Service D

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	146	177	469	93	72	503
Future Volume (vph)	146	177	469	93	72	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.978			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1810	1807	0	1504	1583
Flt Permitted	0.242				0.950	
Satd. Flow (perm)	438	1810	1807	0	1504	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			235
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%
Adj. Flow (vph)	159	192	510	101	78	547
Shared Lane Traffic (%)						
Lane Group Flow (vph)	159	192	611	0	78	547
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2025 Total

Synchro 9 Report
Page 5

Lanes, Volumes, Timings

3: North Service Road & Millen Road

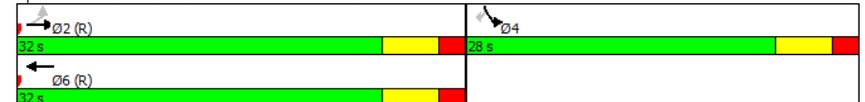
06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	32.0	32.0	32.0		28.0	28.0
Total Split (%)	53.3%	53.3%	53.3%		46.7%	46.7%
Maximum Green (s)	26.0	26.0	26.0		22.0	22.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	26.0	26.0	26.0		22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43		0.37	0.37
v/c Ratio	0.84	0.24	0.77		0.14	0.75
Control Delay	56.2	11.8	22.4		13.6	17.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	56.2	11.8	22.4		13.6	17.4
LOS	E	B	C		B	B
Approach Delay		31.9	22.4		16.9	
Approach LOS		C	C		B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 22.3
 Intersection Capacity Utilization 71.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 3: North Service Road & Millen Road

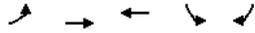


Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2025 Total

Synchro 9 Report
Page 6

Queues
 3: North Service Road & Millen Road

06-14-2018



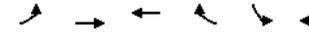
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	159	192	611	78	547
w/c Ratio	0.84	0.24	0.77	0.14	0.75
Control Delay	56.2	11.8	22.4	13.6	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	11.8	22.4	13.6	17.4
Queue Length 50th (m)	15.5	13.4	55.1	5.9	29.1
Queue Length 95th (m)	#48.1	25.4	#107.2	13.8	#79.2
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	189	784	794	551	729
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.84	0.24	0.77	0.14	0.75

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	146	177	469	93	72	503
Future Volume (vph)	146	177	469	93	72	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1810	1807		1504	1583
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	438	1810	1807		1504	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	192	510	101	78	547
RTOR Reduction (vph)	0	0	12	0	0	149
Lane Group Flow (vph)	159	192	599	0	78	398
Heavy Vehicles (%)	5%	5%	2%	7%	20%	2%

Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6		4
Permitted Phases	2				4
Actuated Green, G (s)	26.0	26.0	26.0	22.0	22.0
Effective Green, g (s)	26.0	26.0	26.0	22.0	22.0
Actuated g/C Ratio	0.43	0.43	0.43	0.37	0.37
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)	189	784	783	551	580
w/s Ratio Prot		0.11	0.33		0.05
w/s Ratio Perm	c0.36				c0.25
v/c Ratio	0.84	0.24	0.77	0.14	0.69
Uniform Delay, d1	15.2	10.8	14.4	12.7	16.1
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.1	0.7	7.0	0.5	6.5
Delay (s)	49.3	11.5	21.4	13.2	22.6
Level of Service	D	B	C	B	C
Approach Delay (s)	28.6	21.4	21.4		
Approach LOS		C	C		C

Intersection Summary

HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	↖
Traffic Volume (vph)	8	48	0	22	152	0
Future Volume (vph)	8	48	0	22	152	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.885					
Flt Protected					0.950	
Satd. Flow (prot)	1649	0	0	1863	1770	0
Flt Permitted	0.950					
Satd. Flow (perm)	1649	0	0	1863	1770	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	44.7		49.4		43.7	
Travel Time (s)	3.2		3.6		3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	52	0	24	165	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	0	24	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	↖
Traffic Volume (veh/h)	8	48	0	22	152	0
Future Volume (Veh/h)	8	48	0	22	152	0
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	52	0	24	165	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			61		59 35	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			61		59 35	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			100		83 100	
cM capacity (veh/h)			1542		948 1038	

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	61	24	165
Volume Left	0	0	165
Volume Right	52	0	0
cSH	1700	1542	948
Volume to Capacity	0.04	0.00	0.17
Queue Length 95th (m)	0.0	0.0	5.0
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	6.3	
Intersection Capacity Utilization	18.5%	ICU Level of Service A
Analysis Period (min)	15	

Lanes, Volumes, Timings

5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	56	22	0	174	0	71	0	0	0	0	22
Future Volume (vph)	9	56	22	0	174	0	71	0	0	0	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.966									0.865	
Flt Protected		0.995						0.950				
Satd. Flow (prot)	0	1790	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.995						0.950				
Satd. Flow (perm)	0	1790	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.8			44.7			33.3			43.2	
Travel Time (s)		3.9			3.2			2.4			3.1	
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
Adj. Flow (vph)	10	61	24	0	189	0	77	0	0	0	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	189	0	0	77	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	9	56	22	0	174	0	71	0	0	0	0	22
Future Volume (Veh/h)	9	56	22	0	174	0	71	0	0	0	0	22
Sign Control		Free			Free			Stop			Stop	
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)	10	61	24	0	189	0	77	0	0	0	0	24
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	189			85			306	282	73	282	294	189
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189			85			306	282	73	282	294	189
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			88	100	100	100	100	97
cM capacity (veh/h)	1385			1512			625	622	989	667	613	853

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	95	189	77	24
Volume Left	10	0	77	0
Volume Right	24	0	0	24
cSH	1385	1512	625	853
Volume to Capacity	0.01	0.00	0.12	0.03
Queue Length 95th (m)	0.2	0.0	3.4	0.7
Control Delay (s)	0.9	0.0	11.6	9.3
Lane LOS	A		B	A
Approach Delay (s)	0.9	0.0	11.6	9.3
Approach LOS			B	A

Intersection Summary

Average Delay		3.1	
Intersection Capacity Utilization	29.4%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings

6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	20	87	43	0	267	0	135	0	0	0	0	44
Future Volume (vph)	20	87	43	0	267	0	135	0	0	0	0	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.961									0.865	
Flt Protected		0.993						0.950				
Satd. Flow (prot)	0	1778	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.993						0.950				
Satd. Flow (perm)	0	1778	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.9			53.8			33.6			37.9	
Travel Time (s)		2.8			3.9			2.4			2.7	
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
Adj. Flow (vph)	22	95	47	0	290	0	147	0	0	0	0	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	290	0	0	147	0	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

6: Access 3 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	20	87	43	0	267	0	135	0	0	0	0	44
Future Volume (Veh/h)	20	87	43	0	267	0	135	0	0	0	0	44
Sign Control		Free			Free			Stop			Stop	
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)	22	95	47	0	290	0	147	0	0	0	0	48
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	290			142			500	452	118	452	476	290
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290			142			500	452	118	452	476	290
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			67	100	100	100	100	94
cM capacity (veh/h)	1272			1441			444	494	933	511	479	749

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	164	290	147	48
Volume Left	22	0	147	0
Volume Right	47	0	0	48
cSH	1272	1441	444	749
Volume to Capacity	0.02	0.00	0.33	0.06
Queue Length 95th (m)	0.4	0.0	11.4	1.6
Control Delay (s)	1.2	0.0	17.1	10.1
Lane LOS	A		C	B
Approach Delay (s)	1.2	0.0	17.1	10.1
Approach LOS			C	B

Intersection Summary

Average Delay	4.9
Intersection Capacity Utilization	45.6%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 7: Access 4 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Volume (vph)	1	150	21	0	445	0	64	0	0	0	0	2
Future Volume (vph)	1	150	21	0	445	0	64	0	0	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt	0.983									0.865		
Flt Protected								0.950				
Satd. Flow (prot)	0	1831	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted								0.950				
Satd. Flow (perm)	0	1831	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)	50			50			50			50		
Link Distance (m)	52.2			38.9			35.0			36.9		
Travel Time (s)	3.8			2.8			2.5			2.7		
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
Adj. Flow (vph)	1	163	23	0	484	0	70	0	0	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	187	0	0	484	0	0	70	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			0.0			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Free			Free			Stop			Stop		

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 7: Access 4 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Volume (veh/h)	1	150	21	0	445	0	64	0	0	0	0	2
Future Volume (Veh/h)	1	150	21	0	445	0	64	0	0	0	0	2
Sign Control	Free			Free			Stop			Stop		
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)	1	163	23	0	484	0	70	0	0	0	0	2
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	484			186			662	660	174	660	672	484
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484			186			662	660	174	660	672	484
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			81	100	100	100	100	100
cM capacity (veh/h)	1079			1388			373	383	869	376	377	583

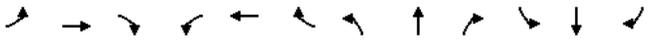
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	187	484	70	2
Volume Left	1	0	70	0
Volume Right	23	0	0	2
cSH	1079	1388	373	583
Volume to Capacity	0.00	0.00	0.19	0.00
Queue Length 95th (m)	0.0	0.0	5.4	0.1
Control Delay (s)	0.1	0.0	16.9	11.2
Lane LOS	A		C	B
Approach Delay (s)	0.1	0.0	16.9	11.2
Approach LOS			C	B

Intersection Summary	
Average Delay	1.6
Intersection Capacity Utilization	40.3%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

1: Green Road & Frances Avenue

06-14-2018



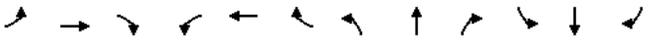
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	16	55	20	278	29	1	17	61	444	3	34	5
Future Volume (vph)	16	55	20	278	29	1	17	61	444	3	34	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970						0.885			0.985	
Flt Protected		0.991			0.957			0.998			0.997	
Satd. Flow (prot)	0	1826	0	0	1770	0	0	1678	0	0	1866	0
Flt Permitted		0.991			0.957			0.998			0.997	
Satd. Flow (perm)	0	1826	0	0	1770	0	0	1678	0	0	1866	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			52.2			184.8			166.7	
Travel Time (s)		11.9			3.8			13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	17	60	22	302	32	1	18	66	483	3	37	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	0	335	0	0	567	0	0	45	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	66.0%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

1: Green Road & Frances Avenue

06-14-2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	16	55	20	278	29	1	17	61	444	3	34	5
Future Volume (Veh/h)	16	55	20	278	29	1	17	61	444	3	34	5
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)	17	60	22	302	32	1	18	66	483	3	37	5
Pedestrians		2			1			1			1	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	409	634	42	443	394	310	44			550		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	409	634	42	443	394	310	44			550		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	85	98	32	94	100	99			100		
cM capacity (veh/h)	522	393	1031	446	536	734	1575			1029		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	335	567	45
Volume Left	17	302	18	3
Volume Right	22	1	483	5
cSH	479	453	1575	1029
Volume to Capacity	0.21	0.74	0.01	0.00
Queue Length 95th (m)	6.2	48.2	0.3	0.1
Control Delay (s)	14.5	32.2	0.4	0.6
Lane LOS	B	D	A	A
Approach Delay (s)	14.5	32.2	0.4	0.6
Approach LOS	B	D		

Intersection Summary	
Average Delay	11.9
Intersection Capacity Utilization	66.0%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	326	956	471	196	117	215
Future Volume (vph)	326	956	471	196	117	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			0.0	40.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.960			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1728	0	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1881	1728	0	1770	1615
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	354	1039	512	213	127	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	354	1039	725	0	127	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.3%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (veh/h)	326	956	471	196	117	215
Future Volume (Veh/h)	326	956	471	196	117	215
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	354	1039	512	213	127	234
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	725				2366	618
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	725				2366	618
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	60				0	52
cM capacity (veh/h)	887				23	493

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	354	1039	725	127	234
Volume Left	354	0	0	127	0
Volume Right	0	0	213	0	234
cSH	887	1700	1700	23	493
Volume to Capacity	0.40	0.61	0.43	5.47	0.48
Queue Length 95th (m)	15.5	0.0	0.0	Err	20.1
Control Delay (s)	11.7	0.0	0.0	Err	18.7
Lane LOS	B			F	C
Approach Delay (s)	3.0		0.0	3529.8	
Approach LOS				F	

Intersection Summary	
Average Delay	515.7
Intersection Capacity Utilization	71.3%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	250	823	272	83	94	395
Future Volume (vph)	250	823	272	83	94	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0			0.0	50.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.969			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1786	0	1805	1583
Flt Permitted	0.504				0.950	
Satd. Flow (perm)	958	1863	1786	0	1805	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			36			429
Link Speed (k/h)		80	80		50	
Link Distance (m)		826.3	260.0		127.1	
Travel Time (s)		37.2	11.7		9.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Adj. Flow (vph)	272	895	296	90	102	429
Shared Lane Traffic (%)						
Lane Group Flow (vph)	272	895	386	0	102	429
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2025 Total

Synchro 9 Report
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Lanes, Volumes, Timings

3: North Service Road & Millen Road

06-14-2018

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					4
Detector Phase	2	2	6		4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0		10.0	10.0
Minimum Split (s)	26.0	26.0	26.0		24.0	24.0
Total Split (s)	46.0	46.0	46.0		24.0	24.0
Total Split (%)	65.7%	65.7%	65.7%		34.3%	34.3%
Maximum Green (s)	40.0	40.0	40.0		18.0	18.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effect Green (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
v/c Ratio	0.50	0.84	0.37		0.22	0.59
Control Delay	12.9	21.9	8.6		22.0	6.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	12.9	21.9	8.6		22.0	6.3
LOS	B	C	A		C	A
Approach Delay		19.8	8.6		9.3	
Approach LOS		B	A		A	

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 15.1
 Intersection Capacity Utilization 61.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 3: North Service Road & Millen Road

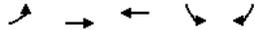


Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2025 Total

Synchro 9 Report
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Queues
 3: North Service Road & Millen Road

06-14-2018



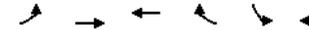
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	272	895	386	102	429
w/c Ratio	0.50	0.84	0.37	0.22	0.59
Control Delay	12.9	21.9	8.6	22.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	21.9	8.6	22.0	6.3
Queue Length 50th (m)	20.3	92.0	23.3	11.1	0.0
Queue Length 95th (m)	40.0	#173.4	39.6	22.9	20.4
Internal Link Dist (m)		802.3	236.0	103.1	
Turn Bay Length (m)	85.0			50.0	
Base Capacity (vph)	547	1064	1036	464	725
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.50	0.84	0.37	0.22	0.59

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 3: North Service Road & Millen Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	250	823	272	83	94	395
Future Volume (vph)	250	823	272	83	94	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Fr't	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1863	1785		1805	1583
Flt Permitted	0.50	1.00	1.00		0.95	1.00
Satd. Flow (perm)	958	1863	1785		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	895	296	90	102	429
RTOR Reduction (vph)	0	0	15	0	0	319
Lane Group Flow (vph)	272	895	371	0	102	110
Heavy Vehicles (%)	0%	2%	4%	0%	0%	2%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	40.0	40.0	40.0		18.0	18.0
Effective Green, g (s)	40.0	40.0	40.0		18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.57		0.26	0.26
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)	547	1064	1020		464	407
w/s Ratio Prot		c0.48	0.21		0.06	
w/s Ratio Perm	0.28					c0.07
w/c Ratio	0.50	0.84	0.36		0.22	0.27
Uniform Delay, d1	9.0	12.4	8.1		20.5	20.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	8.1	1.0		1.1	1.6
Delay (s)	12.2	20.4	9.1		21.6	22.4
Level of Service	B	C	A		C	C
Approach Delay (s)		18.5	9.1		22.2	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↗
Traffic Volume (vph)	23	144	0	2	92	0
Future Volume (vph)	23	144	0	2	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.884					
Flt Protected				0.950		
Satd. Flow (prot)	1647	0	0	1863	1770	0
Flt Permitted	0.950					
Satd. Flow (perm)	1647	0	0	1863	1770	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	44.7		49.4		43.7	
Travel Time (s)	3.2		3.6		3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	157	0	2	100	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	182	0	0	2	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free			Free Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 4: Access 1 & Frances Avenue

06-14-2018

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↗
Traffic Volume (veh/h)	23	144	0	2	92	0
Future Volume (Veh/h)	23	144	0	2	92	0
Sign Control	Free			Free Stop		
Grade	0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	157	0	2	100	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			182			106 104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			182			106 104
tC, single (s)			4.1			6.4 6.2
tC, 2 stage (s)						
tF (s)			2.2			3.5 3.3
p0 queue free %			100			89 100
cM capacity (veh/h)			1393			892 951

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	182	2	100
Volume Left	0	0	100
Volume Right	157	0	0
cSH	1700	1393	892
Volume to Capacity	0.11	0.00	0.11
Queue Length 95th (m)	0.0	0.0	3.0
Control Delay (s)	0.0	0.0	9.5
Lane LOS	A		
Approach Delay (s)	0.0	0.0	9.5
Approach LOS	A		

Intersection Summary

Average Delay	3.4	
Intersection Capacity Utilization	21.9%	ICU Level of Service A
Analysis Period (min)	15	

Lanes, Volumes, Timings
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	29	95	67	0	94	0	43	0	0	0	0	3
Future Volume (vph)	29	95	67	0	94	0	43	0	0	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt		0.953									0.865	
Flt Protected		0.992						0.950				
Satd. Flow (prot)	0	1761	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted		0.992						0.950				
Satd. Flow (perm)	0	1761	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.8			44.7			33.3			48.0	
Travel Time (s)		3.9			3.2			2.4			3.5	
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
Adj. Flow (vph)	32	103	73	0	102	0	47	0	0	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	102	0	0	47	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 5: Access 2 & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	29	95	67	0	94	0	43	0	0	0	0	3
Future Volume (Veh/h)	29	95	67	0	94	0	43	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
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)	32	103	73	0	102	0	47	0	0	0	0	3
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	102				176			308	306	140	306	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102				176			308	306	140	306	102
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	98				100			93	100	100	100	100
cM capacity (veh/h)	1490				1400			631	595	909	636	953

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	208	102	47	3
Volume Left	32	0	47	0
Volume Right	73	0	0	3
cSH	1490	1400	631	953
Volume to Capacity	0.02	0.00	0.07	0.00
Queue Length 95th (m)	0.5	0.0	1.9	0.1
Control Delay (s)	1.3	0.0	11.2	8.8
Lane LOS	A		B	A
Approach Delay (s)	1.3	0.0	11.2	8.8
Approach LOS			B	A

Intersection Summary

Average Delay	2.3
Intersection Capacity Utilization	33.1%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 6: Access 3 & Frances Avenue

06-14-2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	44	263	130	0	141	0	84	0	0	0	0	37
Future Volume (vph)	44	263	130	0	141	0	84	0	0	0	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frt	0.960											0.865
Flt Protected	0.995											0.950
Satd. Flow (prot)	0	1779	0	0	1863	0	0	1770	0	0	1611	0
Flt Permitted	0.995											0.950
Satd. Flow (perm)	0	1779	0	0	1863	0	0	1770	0	0	1611	0
Link Speed (k/h)	50											50
Link Distance (m)	38.9											40.8
Travel Time (s)	2.8											2.9
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
Adj. Flow (vph)	48	286	141	0	153	0	91	0	0	0	0	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	475	0	0	153	0	0	91	0	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0											0.0
Link Offset(m)	0.0											0.0
Crosswalk Width(m)	4.8											4.8
Two way Left Turn Lane												
Headway 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
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Free				Free		Stop				Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 6: Access 3 & Frances Avenue

06-14-2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (veh/h)	44	263	130	0	141	0	84	0	0	0	0	37
Future Volume (Veh/h)	44	263	130	0	141	0	84	0	0	0	0	37
Sign Control	Free				Free		Stop				Stop	
Grade	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)	48	286	141	0	153	0	91	0	0	0	0	40
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
vX, platoon unblocked												
pC, conflicting volume	153			427			646	606	356	606	676	153
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	153			427			646	606	356	606	676	153
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			75	100	100	100	100	96
cM capacity (veh/h)	1428			1132			358	398	688	399	363	893

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	475	153	91	40
Volume Left	48	0	91	0
Volume Right	141	0	0	40
cSH	1428	1132	358	893
Volume to Capacity	0.03	0.00	0.25	0.04
Queue Length 95th (m)	0.8	0.0	7.9	1.1
Control Delay (s)	1.1	0.0	18.4	9.2
Lane LOS	A		C	A
Approach Delay (s)	1.1	0.0	18.4	9.2
Approach LOS			C	A

Intersection Summary	
Average Delay	3.4
Intersection Capacity Utilization	52.9%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
 7: Access 4 & Frances Avenue

06-14-2018

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	436	64	0	262	42	0
Future Volume (vph)	436	64	0	262	42	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.983					
Flt Protected				0.950		
Satd. Flow (prot)	1831	0	0	1863	1770	0
Flt Permitted	0.950					
Satd. Flow (perm)	1831	0	0	1863	1770	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	52.2		38.9		35.0	
Travel Time (s)	3.8		2.8		2.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	474	70	0	285	46	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	544	0	0	285	46	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free			Free Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 7: Access 4 & Frances Avenue

06-14-2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	436	64	0	262	42	0
Future Volume (Veh/h)	436	64	0	262	42	0
Sign Control	Free			Free Stop		
Grade	0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	474	70	0	285	46	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						
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol						
tC, single (s)						
tC, 2 stage (s)						
tF (s)						
p0 queue free %						
cM capacity (veh/h)						

Direction, Lane #

	EB 1	WB 1	NB 1
Volume Total	544	285	46
Volume Left	0	0	46
Volume Right	70	0	0
cSH	1700	1025	357
Volume to Capacity	0.32	0.00	0.13
Queue Length 95th (m)	0.0	0.0	3.5
Control Delay (s)	0.0	0.0	16.6
Lane LOS	C		
Approach Delay (s)	0.0	0.0	16.6
Approach LOS	C		

Intersection Summary

Average Delay	0.9
Intersection Capacity Utilization	36.8%
Analysis Period (min)	15
	ICU Level of Service A

Appendix J

Signal Warrant Justification Worksheet

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2021 Background Traffic
 Region/City/Township: City of Hamilton

Major Street: North Service Road North/South?: N
 Minor Street: Green Road

Number of Approach Lanes: 1
 Tee Intersection?: Y
 Flow Conditions: Free
 PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street North Service Road						Minor Street Green Road						Peds Crossing Main Road
	Eastbound			Westbound			Northbound			Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	17	145		838	34					64		76	
PM Peak Hour	96	897		448	50					48		41	
Average Hourly Volume	28	261	0	0	322	21	0	0	0	28	0	29	0

Warrant	AHV
1A - All	689
1B - Minor	57
2A - Major	631
2B - Cross	28

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	689
		% Fulfilled				143.4%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	180	255	180	255	57
		% Fulfilled				31.8%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	631
		% Fulfilled				131.5%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Traffic Crossing Major Street	50	75	50	75	28
		% Fulfilled				56.0%

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2023 Background Traffic
 Region/City/Township: City of Hamilton

Major Street: North Service Road North/South?: N
 Minor Street: Green Road

Number of Approach Lanes: 1
 Tee Intersection?: Y
 Flow Conditions: Free
 PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street North Service Road						Minor Street Green Road						Peds Crossing Main Road	
	Eastbound			Westbound			Northbound			Southbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour	44	147			863	52					104		178	
PM Peak Hour	179	926			459	102					73		103	
Average Hourly Volume	56	268	0	0	331	39	0	0	0	0	44	0	70	0

Warrant	AHV
1A - All	808
1B - Minor	115
2A - Major	693
2B - Cross	44

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	
					% Fulfilled	168.2%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	180	255	180	255	
					% Fulfilled	63.6%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	
					% Fulfilled	144.4%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Traffic Crossing Major Street	50	75	50	75	
					% Fulfilled	88.5%

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2023 Background Traffic
 Region/City/Township: City of Hamilton

Major Street: North Service Road North/South?: N
 Minor Street: Green Road

Number of Approach Lanes: 1
 Tee Intersection?: Y
 Flow Conditions: Free
 PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street North Service Road						Minor Street Green Road						Peds Crossing Main Road	
	Eastbound			Westbound			Northbound			Southbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour	68	149			888	70					142		274	
PM Peak Hour	256	956			471	151					96		160	
Average Hourly Volume	81	276	0	0	340	55	0	0	0	0	60	0	109	0

Warrant	AHV
1A - All	920
1B - Minor	168
2A - Major	752
2B - Cross	60

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume	
	Flow Conditions	Free	Restricted	Free	Restricted		
		X					
All Approaches		480	720	600	900	920	
						% Fulfilled	191.7%

1B	Approach Lanes	1		2 or more		Average Hourly Volume	
	Flow Conditions	Free	Restricted	Free	Restricted		
		X					
Minor Street Approaches		180	255	180	255	168	
						% Fulfilled	93.3%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume	
	Flow Conditions	Free	Restricted	Free	Restricted		
		X					
Major Street Approaches		480	720	600	900	752	
						% Fulfilled	156.7%

2B	Approach Lanes	1		2 or more		Average Hourly Volume	
	Flow Conditions	Free	Restricted	Free	Restricted		
		X					
Traffic Crossing Major Street		50	75	50	75	60	
						% Fulfilled	119.0%

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2021 Total Traffic
 Region/City/Township: City of Hamilton

Major Street: North Service Road North/South?: N
 Minor Street: Green Road

Number of Approach Lanes: 1
 Tee Intersection?: Y
 Flow Conditions: Free
 PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street North Service Road						Minor Street Green Road						Peds Crossing Main Road	
	Eastbound			Westbound			Northbound			Southbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour	43	145			838	51					102		175	
PM Peak Hour	176	897			448	100					71		101	
Average Hourly Volume	55	261	0	0	322	38	0	0	0	0	43	0	69	0

Warrant	AHV
1A - All	787
1B - Minor	112
2A - Major	675
2B - Cross	43

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	
		% Fulfilled				163.9%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	180	255	180	255	
		% Fulfilled				62.4%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	
		% Fulfilled				140.5%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Traffic Crossing Major Street	50	75	50	75	
		% Fulfilled				86.5%

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2021 Total Traffic
 Region/City/Township: City of Hamilton

Major Street: North Service Road North/South?: N
 Minor Street: Green Road

Number of Approach Lanes: 1
 Tee Intersection?: Y
 Flow Conditions: Free
 PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street North Service Road						Minor Street Green Road						Peds Crossing Main Road	
	Eastbound			Westbound			Northbound			Southbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour	68	147			863	68					139		270	
PM Peak Hour	252	926			459	149					94		158	
Average Hourly Volume	80	268	0	0	331	54	0	0	0	0	58	0	107	0

Warrant	AHV
1A - All	898
1B - Minor	165
2A - Major	733
2B - Cross	58

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	898
		% Fulfilled				187.1%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	180	255	180	255	165
		% Fulfilled				91.8%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	733
		% Fulfilled				152.7%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Traffic Crossing Major Street	50	75	50	75	58
		% Fulfilled				116.5%

Signal Justification Calculation for Forecasted Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2021 Total Traffic
 Region/City/Township: City of Hamilton

Major Street: North Service Road North/South?: N
 Minor Street: Green Road

Number of Approach Lanes: 1
 Tee Intersection?: Y
 Flow Conditions: Free
 PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	Yes	Justification for existing intersections with forecast traffic

Time Period	Major Street North Service Road						Minor Street Green Road						Peds Crossing Main Road	
	Eastbound			Westbound			Northbound			Southbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour	92	149			888	84					174		358	
PM Peak Hour	326	956			471	196					117		215	
Average Hourly Volume	105	276	0	0	340	70	0	0	0	0	73	0	143	0

Warrant	AHV
1A - All	1007
1B - Minor	216
2A - Major	791
2B - Cross	73

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	All Approaches	480	720	600	900	
		% Fulfilled				209.7%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	180	255	180	255	
		% Fulfilled				120.0%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Major Street Approaches	480	720	600	900	
		% Fulfilled				164.7%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Traffic Crossing Major Street	50	75	50	75	
		% Fulfilled				145.5%

Appendix K

Westbound Right-Turn Lane Preliminary Design



Preliminary Right-Turn Lane Design North Service Road and Green Road

Appendix L

2025 Remedial Measures Traffic Operations Reports

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Volume (vph)	13	19	17	452	59	0	5	18	153	0	62	8
Future Volume (vph)	13	19	17	452	59	0	5	18	153	0	62	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Ped Bike Factor												
Frt		0.954						0.883			0.984	
Flt Protected		0.987		0.950				0.999				
Satd. Flow (prot)	0	1743	0	1805	1900	0	0	1569	0	0	1870	0
Flt Permitted		0.987		0.950				0.999				
Satd. Flow (perm)	0	1743	0	1805	1900	0	0	1569	0	0	1870	0
Link Speed (k/h)		50		50				50			50	
Link Distance (m)		165.1		52.2				184.8			166.7	
Travel Time (s)		11.9		3.8				13.3			12.0	
Confl. Peds. (#/hr)	1					1	2		3	3		2
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
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%
Adj. Flow (vph)	14	21	18	491	64	0	5	20	166	0	67	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	53	0	491	64	0	0	191	0	0	76	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6		3.6				3.6			3.6	
Link Offset(m)		0.0		0.0				0.0			0.0	
Crosswalk Width(m)		4.8		4.8				4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop		Stop			Free		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Volume (veh/h)	13	19	17	452	59	0	5	18	153	0	62	8
Future Volume (Veh/h)	13	19	17	452	59	0	5	18	153	0	62	8
Sign Control		Stop		Stop			Free		Free		Free	
Grade		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)	14	21	18	491	64	0	5	20	166	0	67	9
Pedestrians		2		3				1			1	
Lane Width (m)		3.6		3.6				3.6			3.6	
Walking Speed (m/s)		1.2		1.2				1.2			1.2	
Percent Blockage		0		0				0			0	
Right turn flare (veh)												
Median type							None		None		None	
Median storage (veh)												
Upstream signal (m)							185					
pX, platoon unblocked												
vC, conflicting volume	220	272	74	216	194	107	78			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220	272	74	216	194	107	78			189		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	97	98	31	91	100	100			100		
cM capacity (veh/h)	664	633	992	707	700	949	1531			1394		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	53	491	64	191	76
Volume Left	14	491	0	5	0
Volume Right	18	0	0	166	9
cSH	732	707	700	1531	1394
Volume to Capacity	0.07	0.69	0.09	0.00	0.00
Queue Length 95th (m)	1.9	45.1	2.4	0.1	0.0
Control Delay (s)	10.3	20.8	10.7	0.2	0.0
Lane LOS	B	C	B	A	
Approach Delay (s)	10.3	19.7		0.2	0.0
Approach LOS	B	C			

Intersection Summary	
Average Delay	13.1
Intersection Capacity Utilization	53.6%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↔	↔	↔
Traffic Volume (vph)	92	149	888	84	174	358
Future Volume (vph)	92	149	888	84	174	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			60.0	40.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1696	1827	1357	1770	1615
Flt Permitted	0.138				0.950	
Satd. Flow (perm)	245	1696	1827	1326	1770	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				80		149
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Adj. Flow (vph)	100	162	965	91	189	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	162	965	91	189	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	2.0	10.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

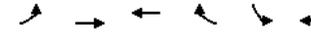
Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2025 Total

Synchro 9 Report
Page 3

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	26.0	24.0	24.0
Total Split (s)	70.0	70.0	70.0	70.0	30.0	30.0
Total Split (%)	70.0%	70.0%	70.0%	70.0%	30.0%	30.0%
Maximum Green (s)	64.0	64.0	64.0	64.0	24.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	64.0	64.0	64.0	64.0	24.0	24.0
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.24	0.24
v/c Ratio	0.64	0.15	0.83	0.10	0.45	0.78
Control Delay	34.0	7.6	21.5	2.3	36.3	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	7.6	21.5	2.3	36.3	33.7
LOS	C	A	C	A	D	C
Approach Delay		17.7	19.8		34.6	
Approach LOS		B	B		C	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 24.0
 Intersection Capacity Utilization 88.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 2: North Service Road & Green Road



Waterfront Trails TIS 5:00 pm 06-13-2018 AM 2025 Total

Synchro 9 Report
Page 4

Queues
 2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	100	162	965	91	189	389
w/c Ratio	0.64	0.15	0.83	0.10	0.45	0.78
Control Delay	34.0	7.6	21.5	2.3	36.3	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	7.6	21.5	2.3	36.3	33.7
Queue Length 50th (m)	11.3	12.0	136.5	0.7	32.9	46.5
Queue Length 95th (m)	#43.0	20.4	204.7	6.2	54.6	#92.7
Internal Link Dist (m)		99.4	802.3		160.8	
Turn Bay Length (m)	120.0		60.0	40.0		
Base Capacity (vph)	156	1085	1169	877	424	500
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 w/c Ratio	0.64	0.15	0.83	0.10	0.45	0.78

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	92	149	888	84	174	358
Future Volume (vph)	92	149	888	84	174	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1687	1696	1827	1326	1770	1615
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	245	1696	1827	1326	1770	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	162	965	91	189	389
RTOR Reduction (vph)	0	0	0	29	0	113
Lane Group Flow (vph)	100	162	965	62	189	276
Confl. Peds. (#/hr)	1			1		
Heavy Vehicles (%)	7%	12%	4%	19%	2%	0%
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	64.0	64.0	64.0	64.0	24.0	24.0
Effective Green, g (s)	64.0	64.0	64.0	64.0	24.0	24.0
Actuated g/C Ratio	0.64	0.64	0.64	0.64	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)	156	1085	1169	848	424	387
v/s Ratio Prot		0.10	c0.53		0.11	
v/s Ratio Perm	0.41			0.05		c0.17
w/c Ratio	0.64	0.15	0.83	0.07	0.45	0.71
Uniform Delay, d1	11.0	7.2	13.7	6.8	32.3	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.5	0.3	6.7	0.2	3.4	10.7
Delay (s)	29.5	7.5	20.4	7.0	35.7	45.5
Level of Service	C	A	C	A	D	D
Approach Delay (s)		15.9	19.3		42.3	
Approach LOS		B	B		D	

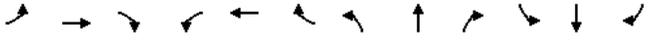
Intersection Summary

HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
 1: Green Road & Frances Avenue

06-14-2018

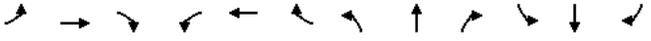


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Volume (vph)	16	55	20	278	29	1	17	61	444	3	34	5
Future Volume (vph)	16	55	20	278	29	1	17	61	444	3	34	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970			0.995			0.885			0.985	
Flt Protected		0.991		0.950				0.998			0.997	
Satd. Flow (prot)	0	1826	0	1752	1890	0	0	1678	0	0	1866	0
Flt Permitted		0.991		0.950				0.998			0.997	
Satd. Flow (perm)	0	1826	0	1752	1890	0	0	1678	0	0	1866	0
Link Speed (k/h)		50		50				50			50	
Link Distance (m)		165.1		52.2				184.8			166.7	
Travel Time (s)		11.9		3.8				13.3			12.0	
Confl. Peds. (#/hr)	1		1	1		1	2		1	1		2
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
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	17	60	22	302	32	1	18	66	483	3	37	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	302	33	0	0	567	0	0	45	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6		3.6				3.6			3.6	
Link Offset(m)		0.0		0.0				0.0			0.0	
Crosswalk Width(m)		4.8		4.8				4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop		Stop			Free		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 1: Green Road & Frances Avenue

06-14-2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Volume (veh/h)	16	55	20	278	29	1	17	61	444	3	34	5
Future Volume (Veh/h)	16	55	20	278	29	1	17	61	444	3	34	5
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)	17	60	22	302	32	1	18	66	483	3	37	5
Pedestrians		2		1				1			1	
Lane Width (m)		3.6		3.6				3.6			3.6	
Walking Speed (m/s)		1.2		1.2				1.2			1.2	
Percent Blockage		0		0				0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								185				
pX, platoon unblocked												
vC, conflicting volume	409	634	42	443	394	310	44			550		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	409	634	42	443	394	310	44			550		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	85	98	32	94	100	99			100		
cM capacity (veh/h)	522	393	1031	446	536	734	1575			1029		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	99	302	33	567	45
Volume Left	17	302	0	18	3
Volume Right	22	0	1	483	5
cSH	479	446	541	1575	1029
Volume to Capacity	0.21	0.68	0.06	0.01	0.00
Queue Length 95th (m)	6.2	39.6	1.6	0.3	0.1
Control Delay (s)	14.5	28.4	12.1	0.4	0.6
Lane LOS	B	D	B	A	A
Approach Delay (s)	14.5	26.8		0.4	0.6
Approach LOS	B	D			

Intersection Summary	
Average Delay	10.2
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↙	↘	↗
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	326	956	471	196	117	215
Future Volume (vph)	326	956	471	196	117	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0			60.0	40.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1881	1776	1583	1770	1615
Flt Permitted	0.428				0.950	
Satd. Flow (perm)	813	1881	1776	1583	1770	1615
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				213		234
Link Speed (k/h)		80	80		50	
Link Distance (m)		123.4	826.3		184.8	
Travel Time (s)		5.6	37.2		13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Adj. Flow (vph)	354	1039	512	213	127	234
Shared Lane Traffic (%)						
Lane Group Flow (vph)	354	1039	512	213	127	234
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	2.0	10.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	

Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2025 Total

Synchro 9 Report
Page 3

Lanes, Volumes, Timings

2: North Service Road & Green Road

06-14-2018

	↖	→	←	↙	↘	↗
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	10.0	10.0
Minimum Split (s)	26.0	26.0	26.0	26.0	24.0	24.0
Total Split (s)	66.0	66.0	66.0	66.0	24.0	24.0
Total Split (%)	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%
Maximum Green (s)	60.0	60.0	60.0	60.0	18.0	18.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	60.0	60.0	60.0	60.0	18.0	18.0
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.20	0.20
v/c Ratio	0.65	0.83	0.43	0.19	0.36	0.46
Control Delay	16.0	18.7	8.4	1.2	34.4	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	18.7	8.4	1.2	34.4	7.6
LOS	B	B	A	A	C	A
Approach Delay		18.0	6.3		17.1	
Approach LOS		B	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 14.4
 Intersection Capacity Utilization 68.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 2: North Service Road & Green Road



Waterfront Trails TIS 5:00 pm 06-13-2018 PM 2025 Total

Synchro 9 Report
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Queues
 2: North Service Road & Green Road

06-14-2018



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	354	1039	512	213	127	234
v/c Ratio	0.65	0.83	0.43	0.19	0.36	0.46
Control Delay	16.0	18.7	8.4	1.2	34.4	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	18.7	8.4	1.2	34.4	7.6
Queue Length 50th (m)	33.6	124.1	38.4	0.0	20.1	0.0
Queue Length 95th (m)	67.6	193.1	57.7	6.7	36.9	19.0
Internal Link Dist (m)		99.4	802.3		160.8	
Turn Bay Length (m)	120.0			60.0	40.0	
Base Capacity (vph)	542	1254	1184	1126	354	510
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	0.65	0.83	0.43	0.19	0.36	0.46

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 2: North Service Road & Green Road

06-14-2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	326	956	471	196	117	215
Future Volume (vph)	326	956	471	196	117	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1881	1776	1583	1770	1615
Flt Permitted	0.43	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	813	1881	1776	1583	1770	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	354	1039	512	213	127	234
RTOR Reduction (vph)	0	0	0	71	0	187
Lane Group Flow (vph)	354	1039	512	142	127	47
Heavy Vehicles (%)	0%	1%	7%	2%	2%	0%
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	60.0	60.0	60.0	60.0	18.0	18.0
Effective Green, g (s)	60.0	60.0	60.0	60.0	18.0	18.0
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.20	0.20
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)	542	1254	1184	1055	354	323
v/s Ratio Prot		c0.55	0.29		c0.07	
v/s Ratio Perm	0.44			0.09		0.03
v/c Ratio	0.65	0.83	0.43	0.13	0.36	0.14
Uniform Delay, d1	8.9	11.2	7.0	5.5	31.0	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	6.4	1.2	0.3	2.8	0.9
Delay (s)	14.9	17.6	8.2	5.8	33.8	30.6
Level of Service	B	B	A	A	C	C
Approach Delay (s)	16.9	16.9	7.5	7.5	31.7	31.7
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Appendix M

Proxy Site Survey Parking Data

Period	Time	Parking Demand					Utilization Rate					Parking Rate/Unit				
		Day 1	Day 2	Day 3	Day 4	Average	Day 1	Day 2	Day 3	Day 4	Average	Day 1	Day 2	Day 3	Day 4	Average
AM	6:30	222	255	280	280	259	51%	59%	65%	65%	60%	0.99	1.14	1.25	1.25	1.16
	7:00	205	241	265	261	243	47%	56%	61%	60%	56%	0.92	1.08	1.18	1.17	1.08
	7:30	169	225	253	243	223	39%	52%	59%	56%	52%	0.75	1.00	1.13	1.08	1.00
	8:00	146	207	217	226	199	34%	48%	50%	52%	46%	0.65	0.92	0.97	1.01	0.89
	8:30	121	173	175	224	173	28%	40%	41%	52%	40%	0.54	0.77	0.78	1.00	0.77
	9:00	103	145	152	214	154	24%	34%	35%	50%	36%	0.46	0.65	0.68	0.96	0.69
	9:30	93	131	129	202	139	22%	30%	30%	47%	32%	0.42	0.58	0.58	0.90	0.62
	10:00	84	127	123	197	133	19%	29%	28%	46%	31%	0.38	0.57	0.55	0.88	0.59
PM	15:00	62	94	118	170	111	14%	22%	27%	39%	26%	0.28	0.42	0.53	0.76	0.50
	15:30	67	89	112	173	110	16%	21%	26%	40%	25%	0.30	0.40	0.50	0.77	0.49
	16:00	74	88	118	164	111	17%	20%	27%	38%	26%	0.33	0.39	0.53	0.73	0.50
	16:30	86	108	125	171	123	20%	25%	29%	40%	28%	0.38	0.48	0.56	0.76	0.55
	17:00	96	118	146	188	137	22%	27%	34%	44%	32%	0.43	0.53	0.65	0.84	0.61
	17:30	109	133	155	191	147	25%	31%	36%	44%	34%	0.49	0.59	0.69	0.85	0.66
	18:00	117	143	155	206	155	27%	33%	36%	48%	36%	0.52	0.64	0.69	0.92	0.69
	18:30	127	159	161	206	163	29%	37%	37%	48%	38%	0.57	0.71	0.72	0.92	0.73
	19:00	146	173	189	214	181	34%	40%	44%	50%	42%	0.65	0.77	0.84	0.96	0.81
	19:30	155	177	192	214	185	36%	41%	44%	50%	43%	0.69	0.79	0.86	0.96	0.83
20:00	174	153	205	209	185	40%	35%	47%	48%	43%	0.78	0.68	0.92	0.93	0.83	
AM Peak Demand per Unit															1.25	
AM Average Demand per Unit															1.16	
PM Peak Demand per Unit															0.96	
PM Average Demand per Unit															0.83	



REPORT

WATERFRONT TRAILS 3

STONEY CREEK, ONTARIO

PEDESTRIAN WIND ASSESSMENT

PROJECT #: 1802941

JUNE 7, 2018

SUBMITTED TO

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1. INTRODUCTION

RWDI was retained by New Horizons Development Group (NHDG) to assess the pedestrian wind conditions around the proposed Waterfront Trails 3 development in Stoney Creek, Ontario. This qualitative assessment is based on the following:

- a review of the regional long-term meteorological data from Hamilton International Airport;
- design drawings and documents received from NHDG on May 17, 2018;
- wind-tunnel studies undertaken by RWDI for similar projects in Toronto and Hamilton;
- our engineering judgment, experience and expert knowledge of wind flows around buildings¹⁻³; and,
- use of software developed by RWDI (Windestimator²) for estimating the potential wind conditions around generalized building forms.

This qualitative approach provides a screening-level estimation of potential wind conditions. Conceptual wind control measures to improve wind comfort are recommended, where necessary. In order to quantify these conditions or refine any conceptual mitigation measures, physical scale-model tests in a boundary-layer wind tunnel would be required.

Note that other wind issues, such as those related to cladding and structural wind loads, snow, etc., are not considered in the scope of this assessment.



Image 1 – Rendering of the Proposed Project

1. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", 10th International Conference on Wind Engineering, Copenhagen, Denmark.
2. H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter (2004), "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions", ASCE Structure Congress 2004, Nashville, Tennessee.
3. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", Journal of Wind Engineering and Industrial Aerodynamics, vol.104-106, pp.397-407.



2. SITE & BUILDING INFORMATION

The site of the proposed development is located north of the Queen Elizabeth Way, east of Green Road and south of Frances Avenue in Stoney Creek, Ontario. The proposed development consists of three towers approximately 185 m in height, with a large four-storey podium at the base (Image 1). Currently the site is undeveloped (Image 2). The surrounding environment can be described as :

- 1) Suburban low-rise developments to the east-southeast, clockwise through northwest; and,
- 2) Open water (Lake Ontario) to the north-northwest, clockwise through east.

In the immediate surrounding environment, a group of three broad buildings, approximately 15 storeys in height, exists directly to the north, between the proposed development and Lake Ontario.

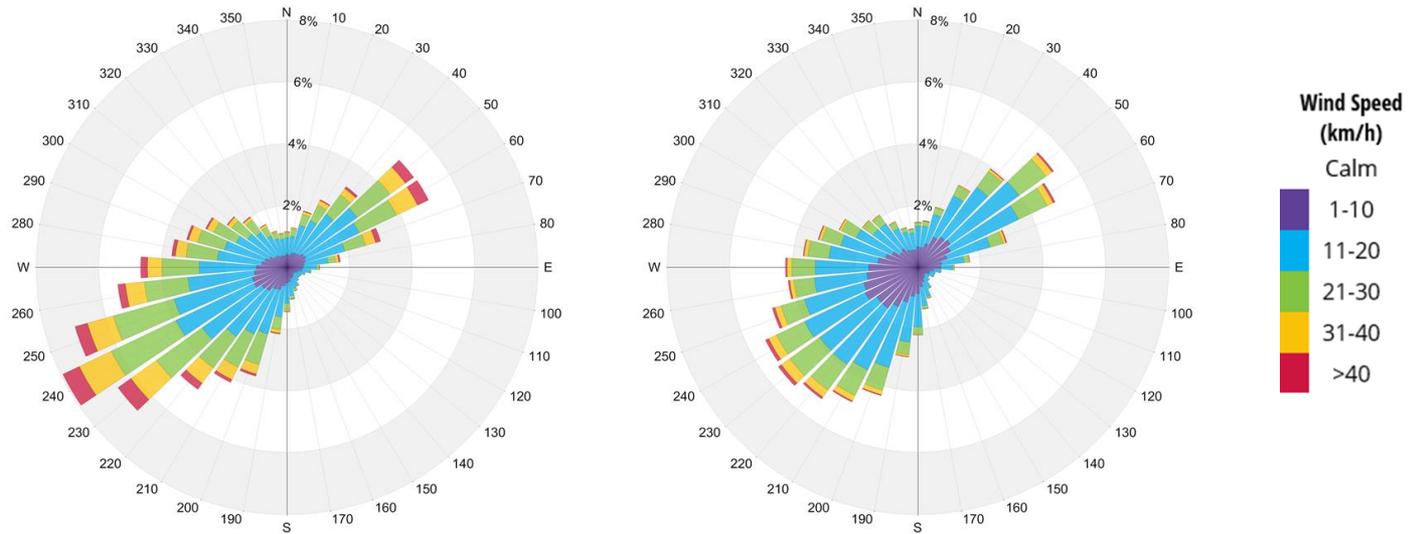


Image 2 – Aerial View of the Site and Surroundings (Credit: Google™ Earth)



3. METEOROLOGICAL DATA

Wind statistics recorded at Hamilton International Airport between 1988 and 2017 were used as a reference for ambient wind conditions for the Summer (May through October) and Winter (November through April) seasons. Image 3 graphically depicts the directional distributions of wind frequencies and speeds for the two seasons. Winds from northeast and southwest quadrants are predominant in both summer and winter. Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10 m) occur more often in the winter than in the summer.



Winter – November through April

Summer – May through October

Image 3 – Directional Distribution of Winds Approaching Hamilton International Airport (1988 – 2017)



4. PEDESTRIAN WIND CRITERIA

The RWDI pedestrian wind criteria are used in the current study. These criteria have been developed by RWDI through research and consulting practice since 1974. They have also been widely accepted by municipal authorities as well as by the building design and city planning community. The criteria are as follows:

Pedestrian Safety

Pedestrian safety is associated with excessive gust wind speeds that can adversely affect a pedestrian's balance and footing. If strong winds that can affect a person's balance (**90 km/h**) occur more than 0.1% of the time, or 9 hours per year, the wind conditions are considered severe.

Pedestrian Comfort

Wind comfort can be categorized by typical pedestrian activities:

Sitting (≤ 10 km/h): Calm or light breezes desired for outdoor seating areas where one can read a paper without having it blown away.

Standing (≤ 14 km/h): Gentle breezes suitable for main building entrances and bus stops.

Strolling (≤ 17 km/h): Moderate winds that would be appropriate for window shopping and strolling along a downtown street, plaza or park.

Walking (≤ 20 km/h): Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering.

Uncomfortable: None of the comfort categories are met

Wind conditions are considered suitable for sitting, standing, strolling or walking if the associate mean wind speeds are expected for at least four out of five days (80% of the time). Wind control measures are typically required at locations where winds are rated as uncomfortable or they exceed the wind safety criterion.

Note that these wind speeds are assessed at the pedestrian height (i.e., 1.5 m above grade or the concerned floor level), typically lower than those recorded in the airport (10 m height and open terrain).

These criteria for wind forces represent average wind tolerance. They are sometimes subjective and regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can also affect people's perception of the wind climate.

For the current development, wind speeds comfortable for walking or strolling are appropriate for parking lots and the surrounding sidewalks. Lower wind speeds comfortable for sitting or standing are preferred for building entrances where pedestrians may linger. For amenity spaces, wind conditions which are comfortable for sitting are generally desired. However, the use of outdoor amenity spaces is more frequent in the summer in Ontario. Increased wind speeds may be acceptable in the winter.



5. PEDESTRIAN WIND CONDITIONS

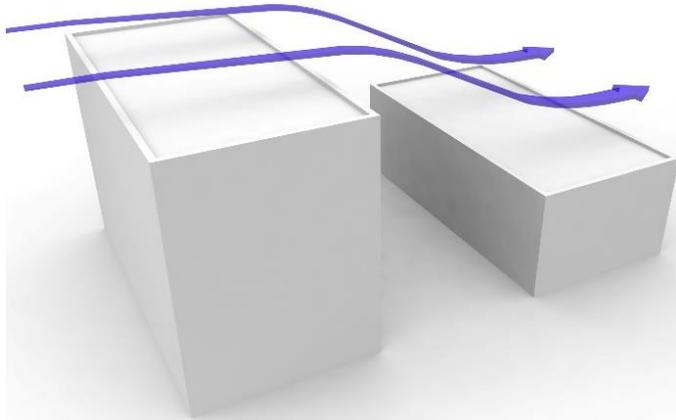
5.1 Background

Predicting wind speeds and frequencies of occurrence is complicated. It involves the assessment of building geometry, orientation, position and height of surrounding buildings, upwind terrain and the local wind climate. Over the years, RWDI has conducted thousands of wind tunnel model studies on pedestrian wind conditions around buildings, yielding a broad knowledge base. This knowledge has been incorporated into RWDI's proprietary software that allows, in many situations, for a screening-level qualitative estimation of pedestrian wind conditions without wind tunnel testing.

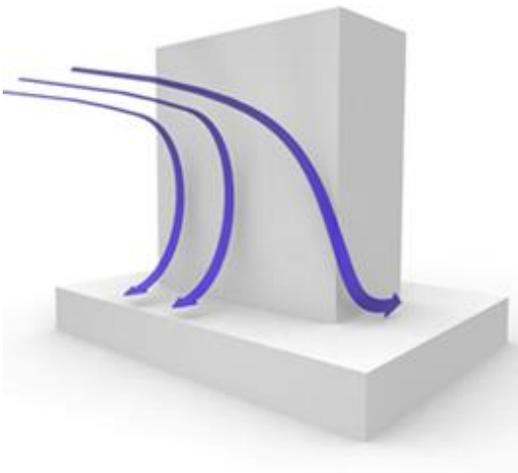
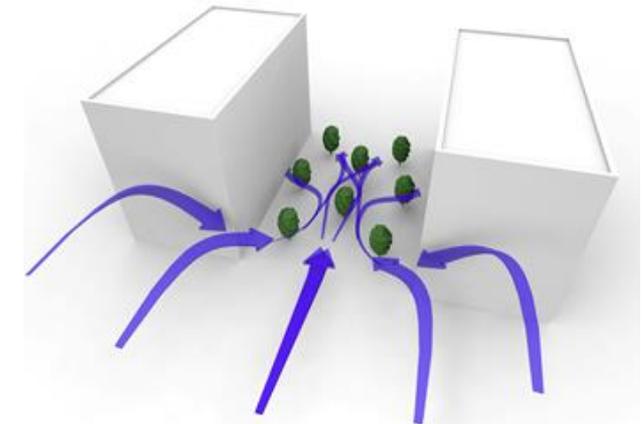
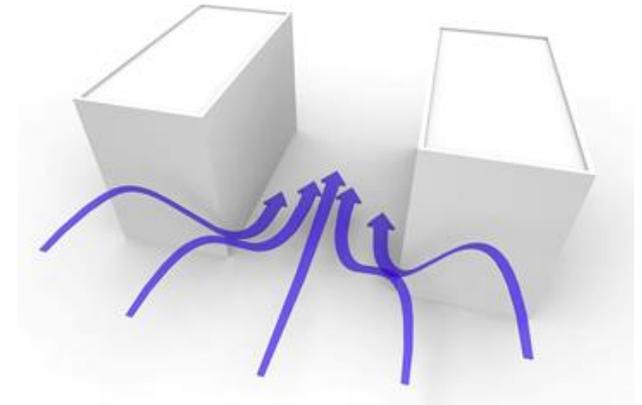
Wind generally tends to flow over arrays of buildings of even height and thereby typically do not result in severe impacts at grade level in these scenarios (Image 4a). Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level (Image 4b). Such a Downwashing Flow is often the main cause for wind accelerations around large buildings at the pedestrian level. When winds approach at an oblique angle to a tall façade and are deflected down, a localized increase in the wind activity or Corner Acceleration can be expected around the exposed building corner at pedestrian level (Image 4b).

When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to a channelling effect caused by the narrow gap (Image 4c). If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and uncomfortable conditions.

Large podiums and tower setbacks capture the downwashed flows and help reduce wind impact at grade (Image 4b). However, increased wind activity would then be created on the lower windward roofs or terraces where low wind speeds are typically desired for amenity use. A typical wind speed reduction strategy is to include landscaping in amenity areas and in the area between buildings (Image 4c). Dense trees and other landscaping helps diffuse strong wind flows and reduces wind impacts in areas under and immediately around them.



a) Wind flow over low-rise buildings



b) Downwashing Wind Flow Around Buildings with Podiums (Left) and Undercuts (Right)

c) Channelling Wind Flow Between Buildings without (Top) and with (Bottom) Landscaping

Image 4 – General Wind Flow Phenomena Around Buildings



5.2 Existing Site

Wind conditions on and around the existing open site (Image 5) are expected to be comfortable for sitting or standing during the summer. During the winter, due to the seasonally stronger winds, wind speeds are expected to be higher and comfortable for strolling.

Wind conditions at all areas are expected to meet the criterion used to assess pedestrian safety.

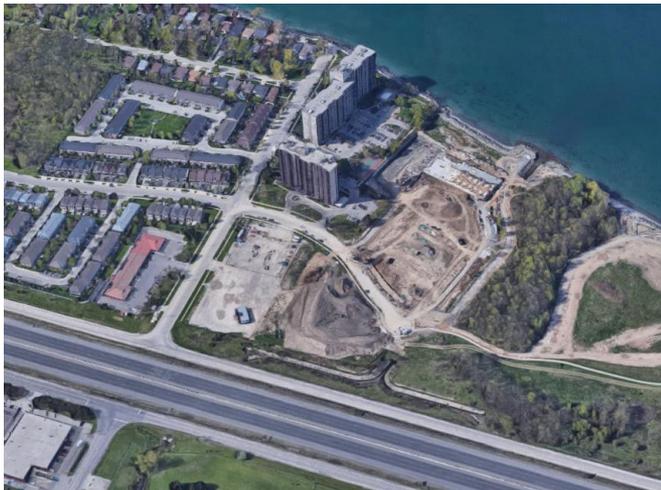


Image 5 – Existing Site

5.3 Proposed Site

5.3.1 Anticipated Wind Flow Patterns

The proposed project is significantly taller than all existing surrounding buildings, and will therefore be exposed to the prevailing winds. In that respect, the proposed orientation of the towers is positive. The towers are oriented so that tower corners face prevailing winds, and the flat façades are on an oblique angle to prevailing winds. This orientation provides the least resistance to winds for the given tower geometry, and will therefore result in the least impact on winds at the pedestrians level.

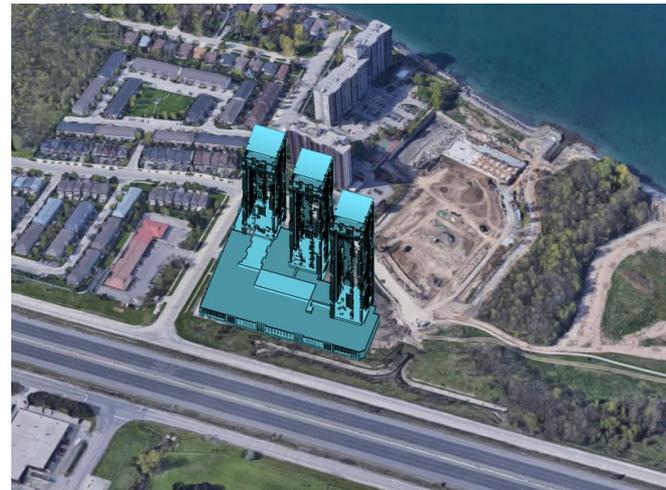


Image 6 – Proposed Site



However, since the proposed development is a set of three towers oriented approximately in a line perpendicular to the prevailing winds, and the three towers are taller than the surroundings (Image 6), it is expected that the towers will intercept stronger winds at higher elevations, resulting in downwashing and channelling flows (Image 4a).

The magnitude of the increase in wind speeds at the base of the towers, relative to the Existing site conditions, depends on multiple factors. The presence of the large four-storey podium at the base of the towers is positive in that it will tend to disperse accelerated wind flows around the base of the towers. Schematics of the predicted wind flow around the tower bases for the most common wind directions are shown in Image 7.

The presence of narrow spaces between buildings will also result in channelling accelerations, as shown in Image 4b and in Image 7. The raised building massing shown in white in Image 7 (top left and top right) are approximately 3.5 m in height and will provide shelter to the areas immediately to the north and east.

Overall, owing to the height of the towers and the gaps between them, downwashing and channelling flows are expected. The large podium is expected to substantially limit the flow of these redirected winds on to Green Road and Queen Elizabeth Way. A schematic of predicted relative wind speeds at the base of the three towers can be seen in Image 8. The following sections discuss these wind conditions in detail.

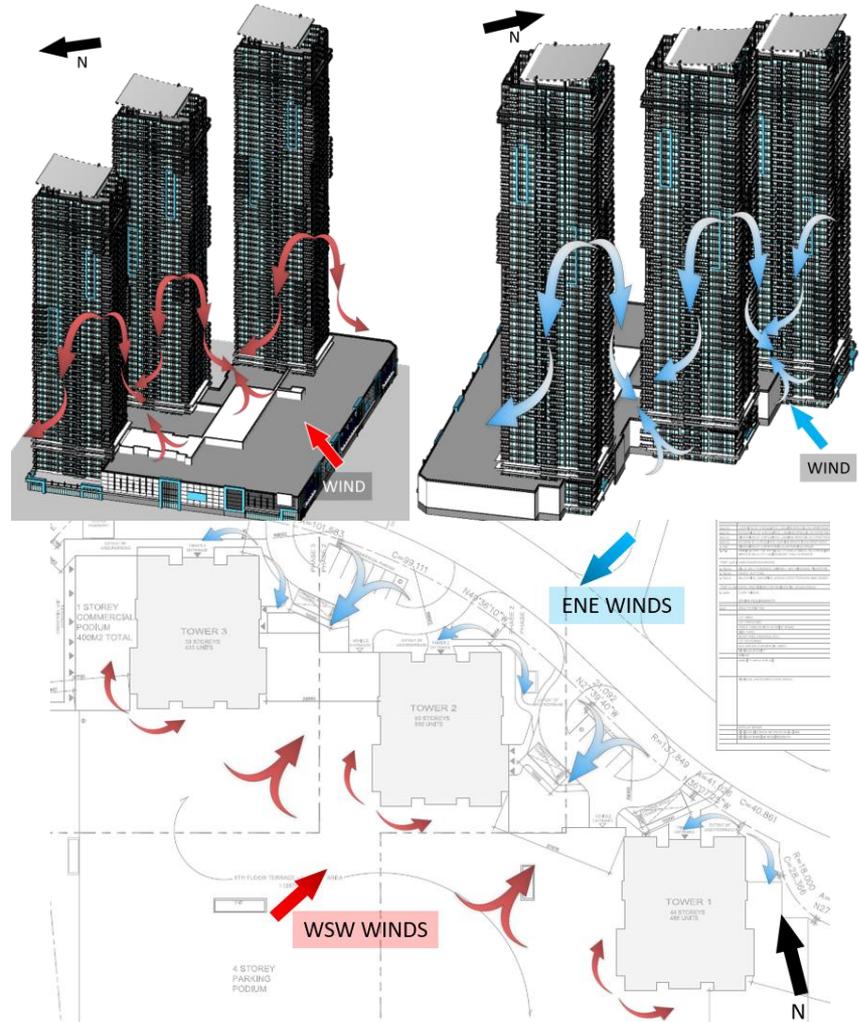


Image 7 – Schematic of Wind Flow Patterns at the Bases of the Towers Due to Winds from the West-Southwest (Top Left), East-Northeast (Right) and Overall (Bottom)

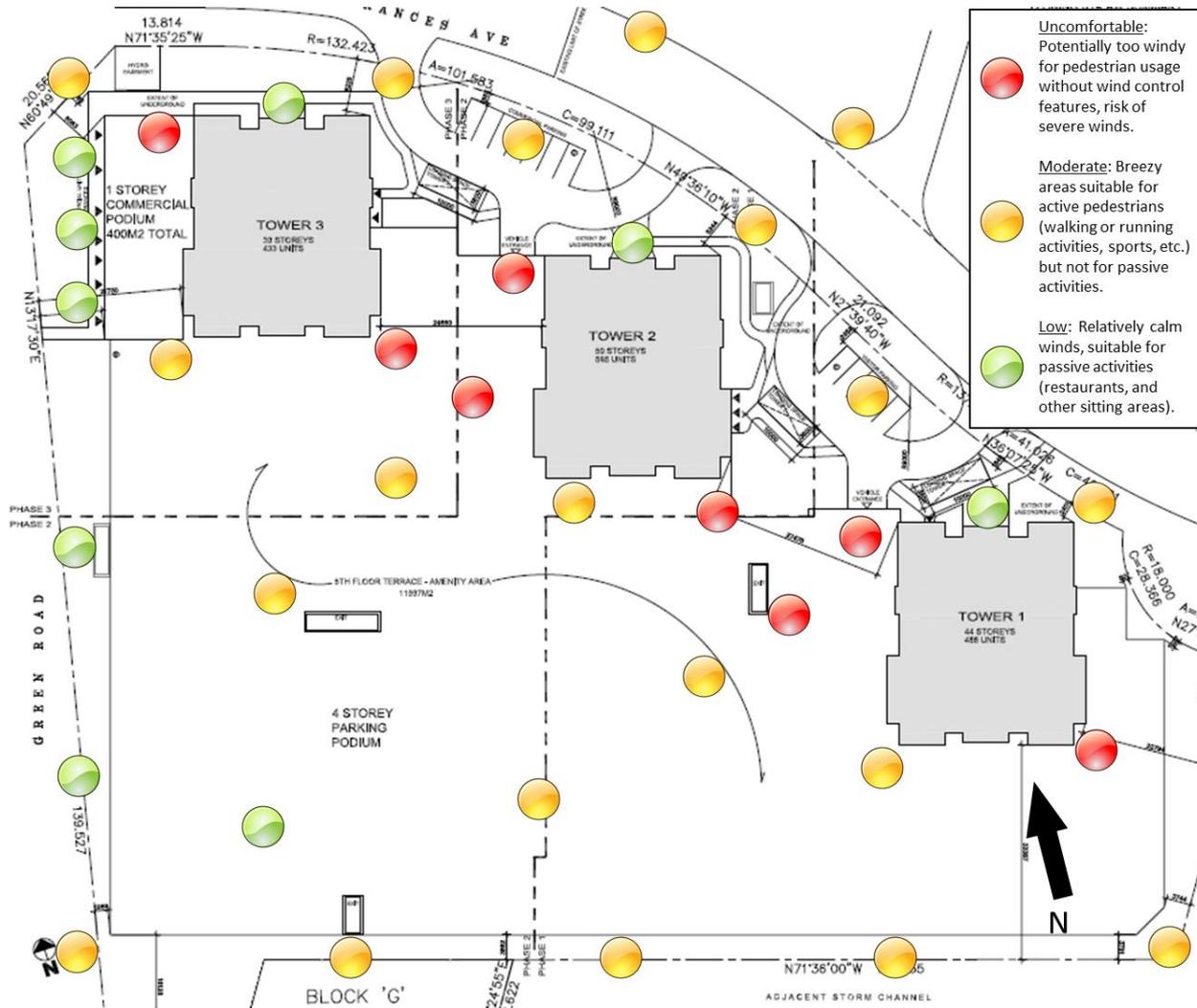


Image 8 – Predicted Relative Winter Wind Speeds at the Base of the Three Towers (Worst Case Condition)



5.3.2 Entrances and Sidewalks

The main entrances to each of the three towers (Image 9, red triangles), located at the center of the north side of each tower. They are both well recessed into the footprint of the towers, and covered by a deep overhead canopy (Image 10). These are positive design features from a wind perspective, in that they shelter the entrances from both direct ambient wind exposure, and downwashing impacts of the prevailing strong winds. It is expected that wind speeds at the tower entrances will

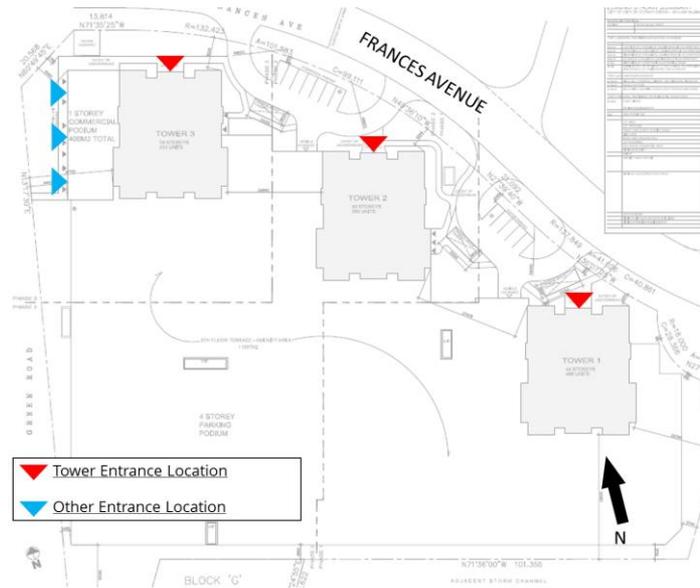


Image 9 – Location of Key Entrances

be comfortable for standing or better throughout the year, which is appropriate for a main entrance. The commercial entrances (Image 9, blue triangles) are also expected to be subject to wind speeds which are comfortable for standing throughout the year. This is because the commercial entrances are not located in an area of accelerated flow, such as between towers or near tower corners. Conversely, the four-storey podium protects the entrances from downwashing flows and corner accelerations typical of the base of the towers.

The towers are expected to cause minor increases in wind activity in the surrounding areas. The presence of the four storey podium is a significant positive design feature which will disperse winds and avoid strong localized wind accelerations (Image 4b). Wind conditions comfortable for walking or strolling are anticipated at the sidewalks along Frances Avenue and Green Road, which is considered appropriate.

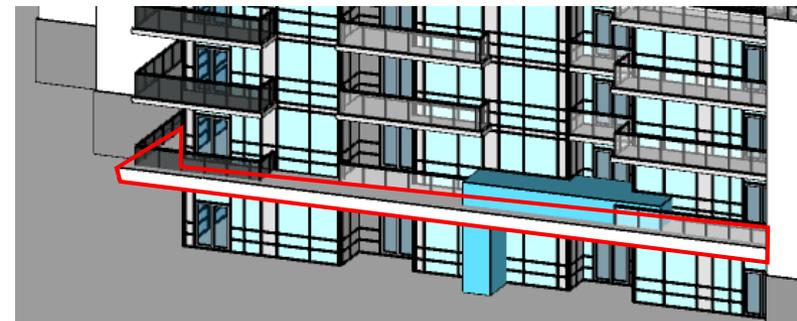


Image 10 – Recessed Entrances and Overhead Canopies



5.3.3 Podium Amenity

As discussed in Section 5.3.1, large podiums capture downwashing flows and this tends to make podium roofs windy for amenity use. It is expected that the wind safety criterion may be exceeded at the northwest and southeast corners of the proposed towers at the podium level as a result of winds channeling and accelerating around the tower corners. Wind speeds at the southwest podium corner, further away from the towers, are expected to be lower. A wind tunnel assessment would allow quantification of the frequency of strong winds at podium locations.

Pedestrian wind conditions on the podium could be improved through the addition of wind screen features and overhead wind control features around sitting areas of the podium amenity space (See Section 6). Strategic placement of landscaping is also an effective means of reducing wind speeds, particularly in the summer when the area will be used frequently.

5.3.4 Rooftop Amenity Spaces

The curved canopy features above the rooftop amenity spaces are well oriented and are positive from a wind perspective, in that they are expected to provide shelter from west-southwesterly winds (Image 11). A portion of the winds from the west-southwest may be drawn underneath

the canopy (Image 11, right), but the net effect of the canopy will be to reduce wind speeds on the rooftop. The more open northeast-facing side of the canopy will trap wind flows and force winds down to the rooftop areas (Image 11, left).

If improved wind comfort conditions are desired on the rooftop amenity spaces, strategic placement of a combination of horizontal and vertical wind control features could be placed around the north and east sides of the amenity space. These features could be in the form of dense landscaping or porous wind screen / parapet features. Screens or landscaping used to reduce direct exposure to ambient winds would need to be at least 2.5 m in height in order to be effective. See Section 6.

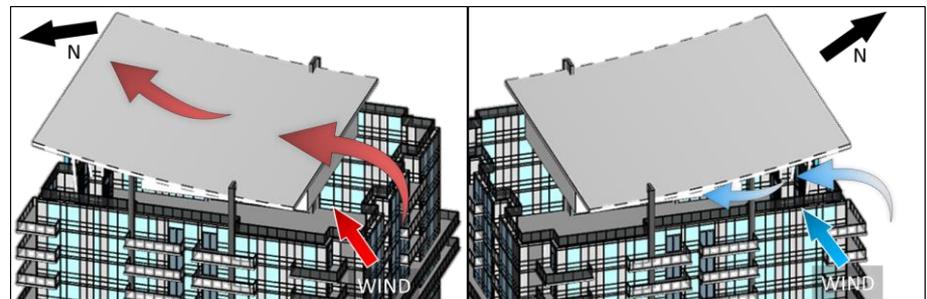


Image 11 – Anticipated Wind Flow Patterns at the Rooftop Amenity Due to Winds from the West-Southwest (Left) and East-Northeast (Right)



6. RECOMMENDATIONS

Wind control features are recommended on the podium amenity space and at the rooftop amenity spaces. Winds are predominantly from the west-southwesterly directions, and secondarily from the east-northeasterly directions. The canopies at the tower rooftops are positive in that they will protect rooftop amenity spaces from west-southwesterly winds.

The rooftop and podium will be exposed to winds from the east-northeasterly directions, and the podium will also be exposed to west-southwesterly winds. Canopies located as low as possible around the tower at the southeast and northwest building corners would be beneficial in terms of wind comfort and safety. Canopies extending from the tower walls should be at least 2.5 m in depth in order to have an appreciable benefit. Additional canopies and/or trellises are recommended over any designated seating or gathering area. Alternatively, trees with large canopies may also be considered for overhead protection.

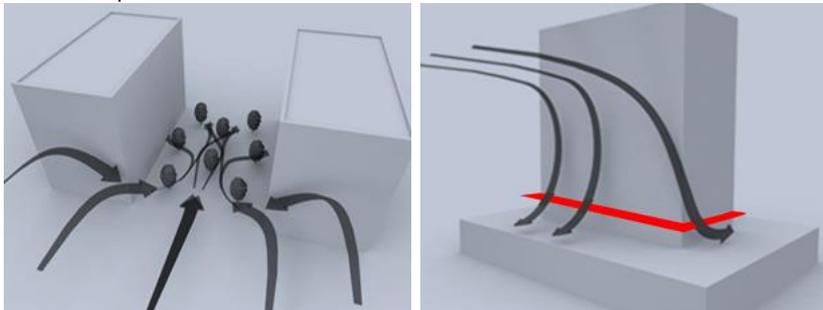


Image 12 – Schematic of Channeling and Downwashing Flows and Conceptual Wind Control Including Landscaping (Left) and Overhead Canopies (Right)

Vertical wind control features would also be beneficial to disrupt the flow of winds on the podium. These could be in the form of porous wind screens or dense landscaping. Vertical features should be at least 2.5 m in height to be effective. Locations where wind control features or increased parapet heights would be beneficial are shown conceptually in Image 13. Examples of these features are shown in Image 14. Wind tunnel testing is required to quantify the impact of these features.

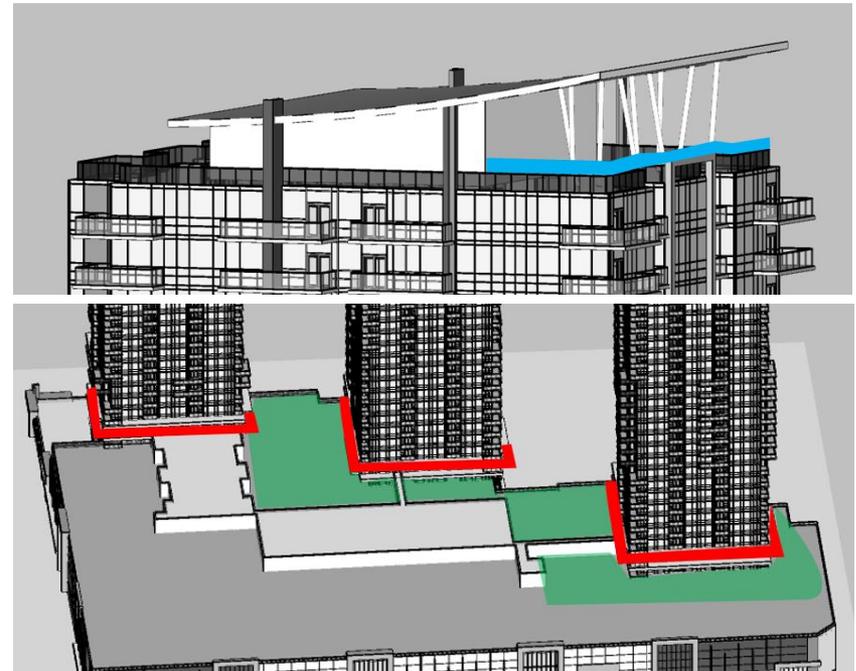
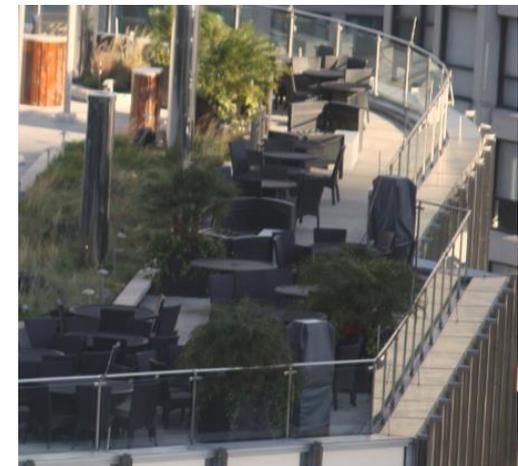


Image 13 – Recommended Wind Control Features Include Overhead Canopies (Red), Wind Screens or Parapets (Blue) and/or Landscaped Areas (Green)



a) Wraparound Overhead Canopies – The strong winds expected to accelerate around the tower corners could be dispersed by wraparound overhead canopies.



b) Dense Landscaping Canopies – The strong winds expected to accelerate around the tower corners could be dispersed by wraparound overhead canopies.

b) Vertical Wind Screens – Strong horizontal wind flows can be reduced by providing vertical features which provide wind resistance

Image 14 - Recommended Wind Control Features Include Overhead Canopies (Top Left), Dense Landscaping (Bottom Left) and Vertical Wind Screens (Right)



7. SUMMARY

The proposed development is located on a site that is currently open and undeveloped. The proposed buildings are significantly taller than the existing surroundings. Therefore, the addition of the proposed development would increase wind speeds at grade level around the development relative to existing conditions.

The design of the development includes several features that are positive from a wind perspective. These include the orientation of the towers with their corners facing into the prevailing winds, large podium that will dissipate downwashing flows, recessed main entrances and deep canopies above them. These features aid in providing critical areas of shelter from strong winds, and are recommended to be retained in the final design.

Wind speeds at the building entrances are expected to be comfortable for standing, and wind speeds at surrounding sidewalk locations are expected to be comfortable for strolling or walking throughout the year. These wind conditions are considered appropriate.

Wind speeds at the podium amenity spaces and rooftop amenity spaces are expected to be stronger than desired. Exceedances of the wind safety criterion may potentially occur at the southeast and northwest corners of each of the towers at the podium level. Conceptual wind control strategies have been discussed and can be refined as the design develops.

The wind conditions discussed herein should be quantified through wind tunnel testing. This would provide verification of areas where wind control features are required and would allow wind control features to be developed .

8. APPLICABILITY OF RESULTS

The assessment discussed in this report is based on the drawings of the proposed development received as of May 17, 2018. In the event of any significant changes to the design, construction or operation of the building or addition of surroundings in the future, RWDI could provide an assessment of their impact on the pedestrian wind conditions discussed in this report. It is the responsibility of others to contact RWDI to initiate this process.

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SHADOW IMPACT ANALYSIS

PROPOSED DEVELOPMENT 48,54&59 Storey Condominium Project 311 FRANCES AVENUE Stoney Creek, Ontario

KNYMH FILE # 17305

Prepared by:
Marc Begin
KNYMH INC.

December 19, 2018

SHADOW IMPACT ANALYSIS

KNYMH FILE # 17305

PROPOSED DEVELOPMENT

48,55&59 Storey Condominiums
311 Frances Avenue
Stoney Creek, Ontario

Prepared by:
KNYMH INC.
Marc Begin

December 19, 2018

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SHADOW IMPACT ANALYSIS

December 19, 2018

PROPOSED DEVELOPMENT

311 Frances Avenue
Stoney Creek, Ontario

1.0 PURPOSE:

The purpose of this report is to analyse the impact of a proposed development upon the adjacent properties, streets, and public spaces at the above noted location. We will discuss and comment upon the impact of the massing of the proposed development upon the adjacent properties using a computer generated model for analysis of the proposed 48,54,59 storey buildings with a 4 storey flat roof parking podium and a rooftop mechanical room which includes the rooftop building service equipment and a decorative sloped roof.

We have provided shadow graphics along with Satellite imagery of the surrounding area.

The property is located in Stoney Creek Ontario, on the North side of the North Service Road, East of Green Road.

2.0 DESCRIPTION OF THE SITE AND NEIGHBOURING PROPERTIES:

The Subject Property: (See Diagram in Section 8.0)

The Subject property is zoned MUC-4

Neighbouring properties include:

2.1) TO THE WEST: The property abuts Green Road. Across Green road is a 1 Storey commercial building zoned GC-35 and further West are 2 storey townhouse units zoned RM3-10.

2.2) TO THE NORTH: The property abuts Frances Avenue. To the North is an existing high rise development zoned RM5 and a recently developed 2 Storey Townhouse site zoned RM3-40 and 3 Storey Units zoned R6-5. Further North is a 4 storey mid rise apartment zoned RM3-40. To the North West across the Green Road France Avenue Intersection, are 2 storey townhouse units zoned RM2.

2.3) TO THE SOUTH: The property abuts the North Service Road and the QEW.

2.4) TO THE EAST: The property abuts a storm channel and conservations lands zoned P1 and P5. Further east are two 6 storey mid rise buildings under construction zoned RM3-55 and recently constructed 2 storey townhouse units zoned RM3-52

3.0 METHOD OF ANALYSIS:

The method of analysis will be a discussion of the impact the development of the 48,54,59 storey residential buildings, fronting Green Road and Frances Avenue, has on the adjacent properties and the public realm. The summary is within Section 6.0.

The graphic analysis which we present within this report is developed using a computer generated modelling program in conjunction with satellite imagery and survey information.

Geographic Coordinates: Latitude 43.23 North, Longitude 79.72 West

Standard Time: UTC -5:00

Daylight Savings Time: UTC -4:00

Test Dates: March 21, June 21, and December 21

Test Times: 1000am, 1200pm, 200pm and 400pm

The diagrams enclosed illustrate shadow patterns for 4 times of day on 3 specific days of the year, which reflect the solstice through the 4 seasons of the year. Generally speaking the analysis of the shadow diagrams identifies the typical shadows, which are cast in a Spring / Fall, Summer and Winter periods.

The following analysis of the shadow plans will discuss the shadow pattern for each of the dates and times and will identify characteristics of those shadows and the anticipated impact upon the immediate site and neighbouring sites with specific concern for amenity spaces and predominantly pedestrian utilized areas which may be impacted by the proposed development.

4.0 SHADOW IMPACT ANALYSIS OF THE PROPOSED DEVELOPMENT

4.1 WINTER SHADOWS: (DECEMBER 21 • Diagrams 7.12.21.1000 through 7.12.21.1600)

The next section provides a summary of the Winter shadow effect of the subject property upon the surrounding area. This commentary will discuss the impact of the 48,54,59 - storey residential apartment building's shadows upon properties at the north, east and west side of the subject property.

It should be noted that Winter Shadows are the "longest" in terms of the shadow length due to a very low sun angle, but shadows are present for the shortest period of time (hours in the day) due to very short days this time of year. The times for this period are under Eastern Standard Time (UTC -5:00).

4.1A 10:00am (Diagram 7.12.21.1000)

The morning sun in winter rotates approximately 116-degrees from east to west in approximately 9-hours at this time of year. At this time the sun has an altitude angle of 16.26 degrees.

- The shadow falls across the Green Road and the adjacent townhouse properties to the Northwest and extending Northwest to the single family properties across Church St

4.1B 12:00pm (Diagram 7.12.21.1200)

The noontime sun in winter is still relatively low (23.21-degrees) in the sky and is located directly south of the subject property.

- The shadow by this time of day falls across Frances Ave and onto the apartment buildings to the North as well as the front yards of some of the townhouses across Green Road and extending Northwest to the single family properties across Church St.

4.1C 2:00pm (Diagram 7.12.21.1400)

The afternoon sun in winter is starting to descend and is 19.25 degrees above the horizon.

- The shadow by this time of day falls across Frances Ave and onto the apartment buildings to the North as well as the townhouses and Mid Rise across Frances Avenue. The shadow is extending well into Lake Ontario

4.1D 4:00pm (Diagram 7.12.21.1600)

The late afternoon sun in winter is descending and is very low at 5.97 degrees above the horizon.

- The shadow by this time of day falls across Frances Ave onto the apartment buildings to the North as well as the townhouses and Mid Rise across Frances Avenue. The shadow is extending well into Lake Ontario.

**4.2 SPRING & FALL EQUINOX SHADOWS:
(MARCH 21 • Diagrams 7.03.21.1000 through 7.03.21.1600)**

A summary of the Spring and Fall shadow effect on the subject property and surrounding area is following. It should be noted that the Fall and Spring are the “moderate” in terms of the annual shadows. The times for this period are under Eastern Daylight Time.

4.2A 10:00am (Diagram 7.03.21.1000)

The morning sun in spring / fall rotates approximately 183-degrees from east to west in 12-hours. It is low in the sky rising to approximately 27.23-degrees at this time of day.

- The shadow falls across Green Road and the adjacent commercial and townhouse properties to the West.

4.2B 12:00pm (Diagram 7.03.21.1200)

The noontime sun in spring / fall is higher (approximately 43.03-degrees) in the sky and originates from near-south.

- The shadow falls across the Green Road Frances Avenue intersection and onto the adjacent townhouse properties to the Northwest and apartment buildings to the North.

4.3C 2:00pm (Diagram 7.03.21.200)

The afternoon sun in spring / fall is near its peak. It is approximately 46.52-degrees above the horizon and the shadows are still short at this time of day.

- The shadow falls across Frances Avenue and the adjacent apartment and townhouse properties to the North, stopping short of the mid rise building.

4.4D 4:00pm (Diagram 7.03.21.400)

The late afternoon sun in spring / fall is descending. It is approximately 35.14-degrees above the horizon and the shadows are still short at this time of day.

- The shadow falls across Frances Avenue and the adjacent apartment and townhouse properties to the North

**4.3 SUMMER SOLSTICE SHADOWS:
(JUNE 21 • Diagrams 7.06.21.1000 through 7.06.21.1600)**

A summary of the Summer Shadow affect is as follows. At this day the solar altitude is at a maximum; Shadows are minor and stay short, falling on to Green road and shortly onto the backyards of the townhouses to the west. The times for this period are under Eastern Daylight Time.

4.3A 10:00am (Diagram 7.06.21.1000)

The morning sun is rising and already at 44.47 degrees at this time. The sun will rotate almost 249 degrees in the sky on this day over fourteen and a half hours.

- The shadow falls across Green Road and the adjacent commercial and townhouse properties to the West

4.3B 12:00pm (Diagram 7.06.21.1200)

The noontime sun in summer is high in the sky (64.13-degrees) originating from the south at this time.

- The shadow falls across the Green Road Frances Avenue intersection and onto the adjacent townhouse properties to the West.

4.3C 2:00pm (Diagram 7.06.21.1400)

The afternoon sun in summer is at its peak at about 68.6 degrees altitude. The sun appears to be shining from the southwest.

- The shadow falls across Frances Avenue and the adjacent apartment and townhouse properties to the North, stopping short of the 3 storey towns.
-

4.4D 4:00pm (Diagram 7.06.21.1600)

The late afternoon sun in summer has begun descending and is still at about 51.81 degrees altitude. The sun appears to be shining from the southwest.

- The shadow falls across Frances Avenue and the adjacent apartment and townhouse properties to the North

5.0 GENERAL OBSERVATIONS: REGARDING THE 14 STOREY DEVELOPMENT

5.1 The shadows cast from this proposed Apartment building are largest in the Winter.

- Shadows fall on the adjacent townhouse units across Green Road and the single family properties to the Northwest across Church St in the morning but no shadows shortly after noon.
- Existing Apartment buildings cast morning shadow in this neighborhood
- Morning shadow will cast along the sidewalks of Green Road, whereas in afternoon Frances road will be in shadow.
- Mid day shadows cast on the adjacent townhouse and apartment building properties across Frances Ave

5.2 The major shadow affect in Spring and Fall is as follows:

- The adjacent commercial and townhouse properties to the west will be affected by shadows in the morning but will be cleared of shadows by noon.
- The adjacent townhouse properties to the Northwest will be affected by shadows between 10 and shortly after 12 noon
- Morning shadow will cast along the sidewalks of Green Road, whereas in afternoon Frances road will be have periods of shadow as the tower shadows rotate.

- Mid day shadows cast on the adjacent townhouse and apartment building properties across Frances Ave, extending to the mid rise building late in the afternoon.

5.3 The major shadow affect in Summer is as follows:

- The adjacent commercial and townhouse properties to the west will be affected by shadows in the morning but will be cleared of shadows by 12 noon.
- Morning shadow will cast along the sidewalks of Green Road, whereas in afternoon Frances road will be have periods of shadow as the tower shadows rotate.
- Mid day shadows cast on the adjacent townhouse and apartment building properties across Frances Ave, however shadows will avoid the actual apartment buildings
- Shadows are very short throughout the whole study period.

5.4 General Comment Regarding Shadow Affect based upon SITE DESIGN:

- With the building being situated as slim point towers the shadow patterns will move quickly and allow for pockets of sunshine between the shadows. Shadows on adjacent buildings to the west and north mostly during Winter and the morning hours of other season and will leave most of the mature surrounding properties unaffected throughout the rest of the day for the majority of the year. The townhouse properties to the north will be free of shadows throughout the morning in all seasons and early afternoon in spring/fall/summer

6.0 SUMMARY OBSERVATIONS: REGARDING SHADOW IMPACT OF A 48,54,59-STOREY BUILDINGS ON THE NEIGHBOURHOOD

- The proposed development will cast winter shadows on the townhouse properties to the west during the morning in all seasons, however the shadows in the spring will be gone by noon and in the summer the shadows will be gone by mid morning.
- It is expected to have a passing impact on the residential properties to the northwest along Chruch St with very short periods of shadow in the winter mornings, however the existing adjacent apartment buildings already provide shadows in this neighborhood.
- Winter shadow will impact the apartment buildings and townhouses across Frances Ave throughout the afternoon in pockets as the tower shadows rotate, but will remain clear in the morning. It is this time of day where shadows can universally be expected to be long-cast, and in a season with fleeting daylight hours. The afternoon shadow impact at this time would be generally the same if the towers were half the height.
- Spring morning shadow will be present for the townhouses along Frances Ave but move very quickly, having minimal impact on individual properties, and will be cleared of Green Road shortly after noon.
- Summer morning shadow will be present for the townhouses south of Frances Ave but move very quickly, having minimal impact on individual properties, and will be cleared of Green Road shortly after noon

- Spring shadow will impact the apartment buildings across Frances Ave through mid afternoon in pockets as the tower shadows rotate, but will remain clear in the morning and late afternoon. Summer shadow will not have an impact on the apartment buildings.
- Spring/Summer shadow will impact the townhouses across Frances Ave throughout the afternoon in pockets as the tower shadows rotate, but will remain clear throughout the morning and early afternoon.
- Most of the outdoor areas for the adjacent townhouses to the North are either covered balconies already providing shadow, or, specifically for the 2 storey units fronting Frances avenue, are to the North of their units, therefore their own unit will already be casting shadow into their rear yards.
- It should be noted that the proposed development is zoned for Unlimited height and Density, and has been zoned this way since before the townhouse properties to the North were developed, therefore although an afternoon impact on these units does exist, consideration should be given to the fact that a reality of a proposed development of this scale would have been available and public knowledge, at the time of construction and purchase.

Based upon the analysis it is our opinion that the proposed development and its proposed height of 48,54 and 59 storeys will not have a significant negative effect on the existing mature neighbourhood to the West/Northwest and apartment buildings to the North. The development will have minor impact on the adjacent recently constructed townhouses to the North, mostly the ones fronting Frances Avenue, however the shadows are contained to the mid afternoon and the spacing of the towers allows for pockets of daylight as the sun rotates maintaining over 5 hours of sunlight for each lot in the spring/fall and 7 hours or more in the summer.

Sincerely,

KNYMH Inc.
Marc Begin

SHADOW IMPACT ANALYSIS

KNYMH FILE # 17305

PROPOSED DEVELOPMENT

48,54&59 Storey Condominiums
311 Frances Avenue
Stoney Creek, Ontario

Prepared by:
KNYMH INC.
Marc Begin

December 19, 2018

SECTION 7.0: APPENDIX "A"

SHADOW PLAN DIAGRAMS FOR THE 3 STUDY PERIODS

SECTION 7.0: 14 Storey Building Concept:

7.03. 21.1000 – 7.03. 21.1000 SHADOW PLANS AT SPRING(FALL): March 21st

7.03. 21.0930 = 10:00 AM

7.03. 21.1200 = 12:30 PM

7.03. 21.1400 = 2:00 PM

7.03. 21.1600 = 4:00 PM

7.06. 21.1000 - 7.06. 21.1600 SHADOW PLANS AT SUMMER: June 21st

7.06. 21.1000 = 10:00 AM

7.06. 21.1200 = 12:00 PM

7.06. 21.1400 = 2:00 PM

7.06. 21.1600 = 4:00 PM

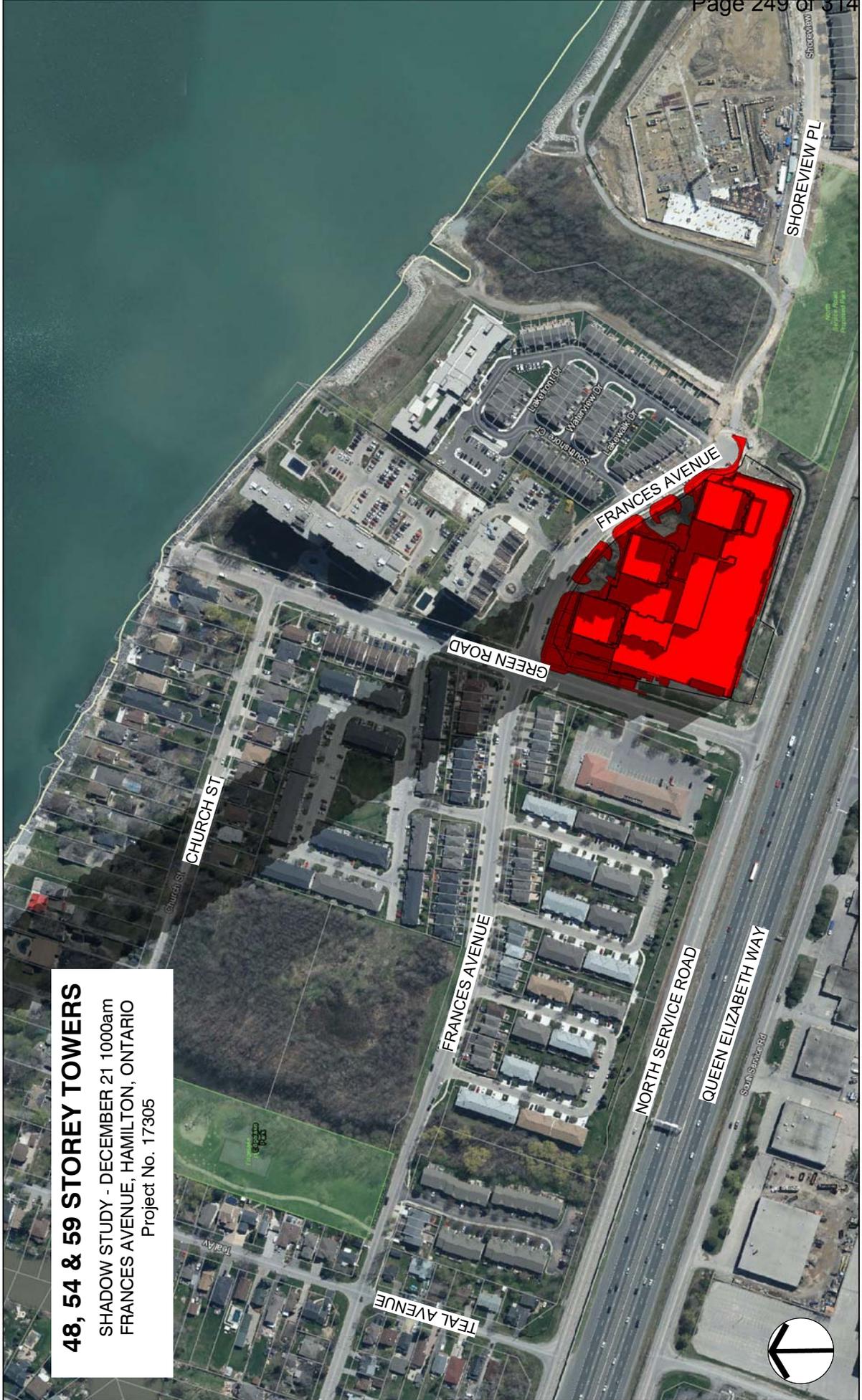
7.12. 21.1000 – 7.12. 21.1600 SHADOW PLANS AT WINTER: December 21st

7.12. 21.1000 = 10:00 AM

7.12. 21.1200 = 12:00 P4

7.12. 21.1400 = 2:00 PM

7.12. 21.1600 = 4:00 PM



48, 54 & 59 STOREY TOWERS
SHADOW STUDY - DECEMBER 21 1000am
FRANCES AVENUE, HAMILTON, ONTARIO
Project No. 17305



07.12.21.1000

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48, 54 & 59 STOREY TOWERS
SHADOW STUDY - DECEMBER 21 1200pm
FRANCES AVENUE, HAMILTON, ONTARIO
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48, 54 & 59 STOREY TOWERS
SHADOW STUDY - DECEMBER 21 4:00pm
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48, 54 & 59 STOREY TOWERS
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48, 54 & 59 STOREY TOWERS
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07.06.21.1400

48, 54 & 59 STOREY TOWERS
SHADOW STUDY - JUNE 21 4:00pm
FRANCES AVENUE, HAMILTON, ONTARIO
Project No. 17305



KNYMH INC.
1006 SKYVIEW DRIVE • SUITE 101
BURLINGTON, ONTARIO • L7P 0V1
T 905.639.6595
www.knymh.com

07.06.21.1600



December 18th, 2018

Our Project No. 17091

Mr. Monir Moniruzzaman
City of Hamilton – Engineering Department
71 Main Street West, Hamilton, Ontario, L8P 4Y5

**RE: 310 FRANCES AVENUE, CITY OF HAMILTON (STONEY CREEK)
STORM WATER MANAGEMENT (SWM) BRIEF/MEMO**

Dear Mr. Monir Moniruzzaman,

Lanhack Consultants Inc. has been retained to review the stormwater impact related to the proposed development located at 310 Frances Avenue in the City of Hamilton (Stoney Creek). The lot is approximately 20,140m² (2.02 ha) in area and is currently vacant except for a temporary sales centre and granular parking lot. It is proposed to construct three (3) condominium towers containing approximately 1,836 residential units and 400m² of commercial space on top of a four(4)-storey parking podium and a two(2)-storey underground parking structure, with a total building footprint of approximately 1.50 ha. See Site Plan by KNYMH Inc. for more detail.

Stormwater Quantity Control

The stormwater from the proposed development will ultimately outlet to Lake Ontario (north of the site) via Watercourse No. #1 (an adjacent storm channel/existing twin 2.71x2.71m concrete box conduit). Therefore, stormwater quantity control will not be required since it is in close proximity of Lake Ontario.

Stormwater Quality Control

The majority of the site consists of clean water; building roof, perimeter sidewalks, and landscaped areas contribute to approximately 96% of the site and is considered to be clean water. The other 4.0% of the site consists of surface parking. Since 96% of the site consists of clean water and does not need to be treated, we recommend that no stormwater quality control measures are to be implemented for this development since there is very minimal treatable surface runoff on site.

Conclusion

In summary, no stormwater quantity control measures are proposed since the stormwater runoff from this development outlets to Lake Ontario. No stormwater quality control measures are proposed since the development is mostly covered by building roof, perimeter sidewalks, and landscaped areas (all surfaces that are considered to be clean stormwater runoff).

Regards,

Tu Vu, B. Eng., EIT
Lanhack Consultants Inc.

John Lamarre, P.Eng.

WATER/WASTEWATER GENERATION REPORT (WWGR)

for

**MIXED USE CONDOMINIUM
DEVELOPMENT**

310 Frances Avenue, Hamilton (Stoney Creek), Ontario

Prepared for:

NHDG (Waterfront) Inc.

Prepared by:

LANHACK CONSULTANTS INC.

1709 Upper James Street
Hamilton, ON L9B 1K7

Project No. 17091

December 18th, 2018

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1.0 INTRODUCTION

1.1 Overview

Lanhack Consultants Inc. has been retained by NHDG (Waterfront) Inc. to prepare a Water/Wastewater Generation Report (WWGR) in support of a proposed mixed use condominium development located at 210 Frances Avenue. The lot is approximately 20,140m² (2.02 ha) in area and is currently vacant except for a temporary sales centre and granular parking lot. It is proposed to construct three (3) condominium towers containing approximately 1,836 residential units and 400m² of commercial space on top of a four(4)-storey parking podium and a two(2)-storey underground parking structure, with a total building footprint of approximately 1.50 ha. See Site Plan in **Appendix B** prepared by KNYMH Inc. for more details.

The site will be serviced by two (2) existing sanitary manholes and a proposed sanitary manhole at the property line along Frances Avenue, six (6) proposed 200mm diameter water services (two for each tower), two (2) proposed storm services on the north property line connecting to the Frances Avenue storm sewer, and two (2) existing storm manholes south of the property outletting into the storm channel. See Servicing Plan in **Appendix B** for more details.

This report will provide the conceptual framework for domestic water distribution, fire flows, and sanitary sewage for the development of this site. This report will also provide design drawings, prepared by Lanhack Consultants Inc., in support of the site plan application.

Please refer to the Lanhack engineering drawings attached in **Appendix B** for additional information.

1.2 Background Information

The following documents were referenced in the preparation of this report:

Ref. 1: Comprehensive Development Guidelines and Financial Policies Manual (City of Hamilton, 2016)

Ref 2: Ontario Building Code (OBC - 2012)

Ref 3: Ministry of the Environment (MOE) – Design Guidelines for Drinking Water Systems (2008)

2.0 Wastewater Assessment

The proposed mixed-use condominium development will consist of three (3) condominium towers containing approximately 1,836 residential units and 400m² of commercial space; 1,227 one-bedroom units and 609 two-bedroom units. Based on the site plan prepared by KNYMH Inc., the design population and equivalent sanitary flow for the development were determined using Part 8 of the Ontario Building Code (OBC, 2012).

2.1 Existing Sanitary Drainage System

The existing sanitary drainage system consists of a 450mmØ concrete sanitary sewer along the north side of the development on Frances Avenue.

2.2 Sanitary Demands

The anticipated sanitary discharge from the proposed development was calculated based on Table 8.2.1.3.A – Residential Occupancies and Table 8.2.1.3.B – Other Occupancies of the OBC (2012). **Table 2.1** summarizes the sanitary sewer discharge rates from the proposed site. Sanitary discharge calculations will be confirmed upon completion of the Wastewater Generation Assessment, which will be prepared as part of the Site Plan Approval process.

Table 2.1: Sanitary Discharge Flow Rate

Type of Unit	Number of Bedrooms per Unit ⁽¹⁾	Average Daily Flow per Person (L/d) ⁽²⁾	Total Number of Units ⁽³⁾	Design Population ⁽⁴⁾	Total Average Flow ⁽⁵⁾ (L/s)
One-Bedroom Unit	1.0	275	1,227	2,454	15.59
Two-Bedroom Unit	2.0	275	609	2,436	
----- Commercial/Office	N/A	5.0 L/m ² /day	400.0 m ²	N/A	
<i>(1) Average number of bedrooms based on floor plans and site plan by KNYMH Inc.</i>					
<i>(2) Average Domestic Sewage Flow Rate from OBC Table 8.2.1.3.A Apartment, Condominiums, Other Multi-family Dwellings = 275 L/person/day</i>					
<i>(3) Refer to site plan prepared by KNYMH Inc. – Appendix B</i>					
<i>(4) Residential population based on two (2) persons per bedroom unit. Refer to OBC Section 3.1.17.1(1b) Commercial/Store discharge rate based on 5.0L/m²/day. Refer to OBC Table 8.2.1.3.B.</i>					
<i>(5) Total Avg. Flow = [(Avg. Daily Flow per Person) x (Total # of Persons)] + [Commercial Discharge Rate] = [(275 L/d/person) x (2,454 persons + 2,436)] + [5.0 L/m²/d x 400m²] /24/60/60 = 15.59 L/s</i>					

Therefore, based on the OBC, the estimated average sanitary discharge flow is **15.59 L/s (0.01559 m³/s)**. Applying the City of Hamilton peak factor (based on Babbitt formula = 3.64), the estimated peak sanitary discharge flow would be **56.75 L/s**.

2.3 Proposed Servicing Plan and Capacity Analysis

As calculated in Table 2.1, the total anticipated sanitary sewer discharge (based on OBC calculation) from the proposed development is **15.59 L/s**. The proposed development will be serviced from the existing 450mm diameter concrete sanitary service on Frances Avenue at a final slope of 0.32%. See Servicing Plan in **Appendix B** for more detail. The anticipated peak sanitary discharge of 15.59 L/s will contribute to approximately 9.7% of the total sewer capacity (full capacity approximately 161.3 L/s). It is not expected that the sanitary discharge from the proposed development will negatively impact the receiving system once the local sanitary pump station upgraded.

3.0 Proposed Water Assessment

The proposed mixed-use condominium development will consist of three (3) condominium towers containing approximately 1,836 residential units and 400m² of commercial space; 1,227 one-bedroom units and 609 two-bedroom units. Based on the site plan prepared by KNYMH Inc., the design population and water uses/demand for the development were determined using the “Fixture Unit Method” as per Table 7.6.3.2.A forming part of sentences 7.6.3.1(1) to (3) and 7.6.3.4.(2), (3) and (5) of the Ontario Building Code (OBC, 2012).

3.1 Existing Water Distribution System

The existing municipal water distribution system north of the site consists of a 300mmØ D.I. watermain within the Frances Avenue right-of-way. The development will connect to the existing 300mmØ D.I. watermain. Multiple existing municipal hydrants are located on the north side of Frances Avenue. See Servicing Plan in **Appendix B** for more detail. Available fire flows and heads have been analyzed to determine if the municipal system adjacent to the subject site is adequate to provide the required fire flow, with a minimum pressure of 20 psi.

3.2 Domestic Water Demands

In reference to the OBC, the average water consumption rate can be calculated using the fixture-unit approach as per Tables 7.6.3.2.A and 7.4.10.5 in the OBC as follows:

Table 3.1: Estimated Domestic Demand via Fixture Units (OBC)

Component	No. of Fixtures/Unit	Fixture Units/Fixture	No. of Units	Total Fixture Units
Residential				
Lavatory (8.3L/min or less per head) (Private)	1	0.7	1,227	858.9
	2		609	852.6
Shower Head (9.5L/min or less per head) (Private)	1	1.4	1,227	1,717.8
	2		609	1,705.2
Water Closet (6 LPF or less with flush tank) (Private)	1	2.2	1,227	2,699.4
	2		609	2,679.6
Dishwasher (Domestic)	1	1.4	1,836	2,570.1
Sink, Kitchen (Domestic, 8.3L/min or less)	1	1.4	1,836	2,570.1
Clothes Washer (3.5 kg)	1	1.4	1,836	2,570.1
Commercial				
Lavatory (8.3L/min or less per head) (Public)	-	2.0	24	48.0
Water Closet (6 LPF or less with flush tank) (Private)	-	2.2	24	52.8
Total Fixture Units				18,324.6

Based on the above table, the total fixture units for the mixed use development is approximately 18,324.6. In reference to Table 7.4.10.5 of the OBC, the approximate maximum probable daily demand is 1,677.6 gal/min (**127.1 L/s**).

3.3 Proposed Water Servicing Plan and Analysis

Water servicing for the site will include the installation of six (6)-200mmØ fire service lines and six (6)-150mmØ domestic services teed off the existing 300mmØ D.I. watermain on Frances Avenue. Refer to the Servicing Plan in **Appendix B** for more details.

4.0 Fire Flow Demand

The fire flow demand for the development will be governed by the Water Supply for Public Fire Protection (Fire Underwriters Survey, 1999), Ontario Building Code (2012), and various codes and standards published by the National Fire Protection Association (NFPA).

Existing hydrants are located Frances Street and on Green Road. The proposed buildings are within the required 90m separation from at least one of the existing hydrants (as per Sentence 3.2.5.7 of the Ontario Building Code), therefore no additional private fire hydrants are proposed for this development.

It has been determined that the required flow for the proposed development is **183.33 L/s (11,000 L/min)**. Refer to **Appendix A** for more detailed calculations and current hydrant flow test data for the development (completed by Jackson Waterworks).

Based on the hydrant flow test data in **Appendix A**, the theoretical maximum available flow rate for the hydrants in close proximity are **292.0 L/s** and **253.0 L/s**, while the maximum required fire flow for the proposed development is **183.33 L/s**. Therefore, the water distribution system has adequate pressure and capacity to service the subject site.

5.0 Conclusion (Domestic/Fire and Sanitary)

Based on the information provided herein, we conclude that the maximum water supply flow and the sanitary discharge at 310 Frances Avenue meet the design requirements of the City of Hamilton (Stoney Creek) and the Ministry of Environment (MOE). The available sanitary flows within the municipal system will be adequate once upgraded and are not expected to be negatively impacted from the proposed development. Water demand and fire flow requirements will be met according to the OBC and FUS requirements. Therefore, it is recommended that:

Sanitary Drainage System

- The sanitary discharge for the subject site will drain to the existing 450mmØ concrete sanitary sewer along Frances Avenue. The anticipated average sanitary discharge will be **15.59 L/s**, which contributes to 9.7% of the total sewer capacity along Frances Avenue.

Water Supply System

- The water supply for the subject site will be from the existing 300mmØ D.I. watermain along Frances Avenue. The maximum probable daily demand based on the OBC Fixture Unit method is 1,677.6 gal/min (**127.1 L/s**).
- A minimum fire suppression flow of approximately **11,000 L/min (183.33 L/s)** will be required as per the guidelines of the Fire Underwriters Survey (FUS).

We trust the information enclosed herein is satisfactory. Should you have any questions please do not hesitate to contact our office.

Respectfully submitted,

12/18/18

Tu Vu, B.Eng., E.I.T.
Lanhack Consultants Inc.

Dave Hacking, P.Eng
Lanhack Consultants Inc.

APPENDIX A: Fire Flow Requirements Calculations

The following calculations are for the proposed development at 310 Frances Avenue, Hamilton (Stoney Creek), Ontario. The Fire Underwriters Survey (FUS) requires that a minimum water supply source 'F' be provided at a minimum pressure of 140 kPa (20 psi). The minimum flow 'F' can be calculated as:

$$F = 220C\sqrt{A}$$

C = coefficient related to construction = **0.6** (fire-resistive construction; protected frames, floors, roof; 1-hour rated)

A = total floor area = **See below**

Determining 'A' – Floor Area for Fire Flow:

As per KNYMH's design, the fire-resistive building is one-hour rated and the vertical openings and exterior vertical communications are properly protected (one hour rating), therefore we will consider only the area of the largest flow plus 25 percent of each of the two immediately adjoining floors. See Site Plan prepared by KNYMH for more detail.

Total floor area required for this analysis will be:

$$[(15,272.0) + (15,272.0 \times 0.25 \times 2.0)]:$$

$$A = 22,908.0 \text{ m}^2$$

Determining 'F' including Reduction Factors:

$$F = 220C\sqrt{A}$$

$$F = 220 \times 0.6 \times \sqrt{22,908.0}$$

$$F = 19,978.7 \text{ L/min} \rightarrow \text{Rounded to the nearest 1,000 L/min} = \mathbf{20,000 \text{ L/min}}$$

Reduction formula for combustibility:

- The mixed use residential condominium is considered to be a low hazard occupancy and limited combustible, so a reduction factor of 15% will be applied:

$$F = 20,000 \times 0.85 = \mathbf{17,000 \text{ L/min}}$$

Reduction formula for sprinkler protection systems:

- The building will consist of NFPA 13 approved sprinklers, supplied by the same municipal water system, and will be fully supervised, so a 50% reduction will be applied:

$$F = 17,000 \times 0.50 = 8,500 \text{ L/min reduction}$$

Increase formula for exposure and building separation:

- There are existing residential buildings on the west, north, and east side of the proposed building (30.1m to 45m separation), therefore, a 15% charge for the fire flow (F) will be required.

$$F = 17,000 \times 0.15 = 2,550 \text{ L/min increase}$$

$$\mathbf{TOTAL F = 17,000 - 8,500 + 2,550 = 11,050 \text{ L/min} \rightarrow \text{Rounded to nearest 1,000 L/min} = \mathbf{11,000 \text{ L/min}}$$

$$F = \mathbf{11,000 \text{ L/min} = 183.33 \text{ L/s}}$$

Hydrant Flow Data

Table 1 below summarizes the hydrant flow test data completed by Jackson Waterworks and **Table 2** summarizes the hydrant flow data made available by the City of Hamilton.

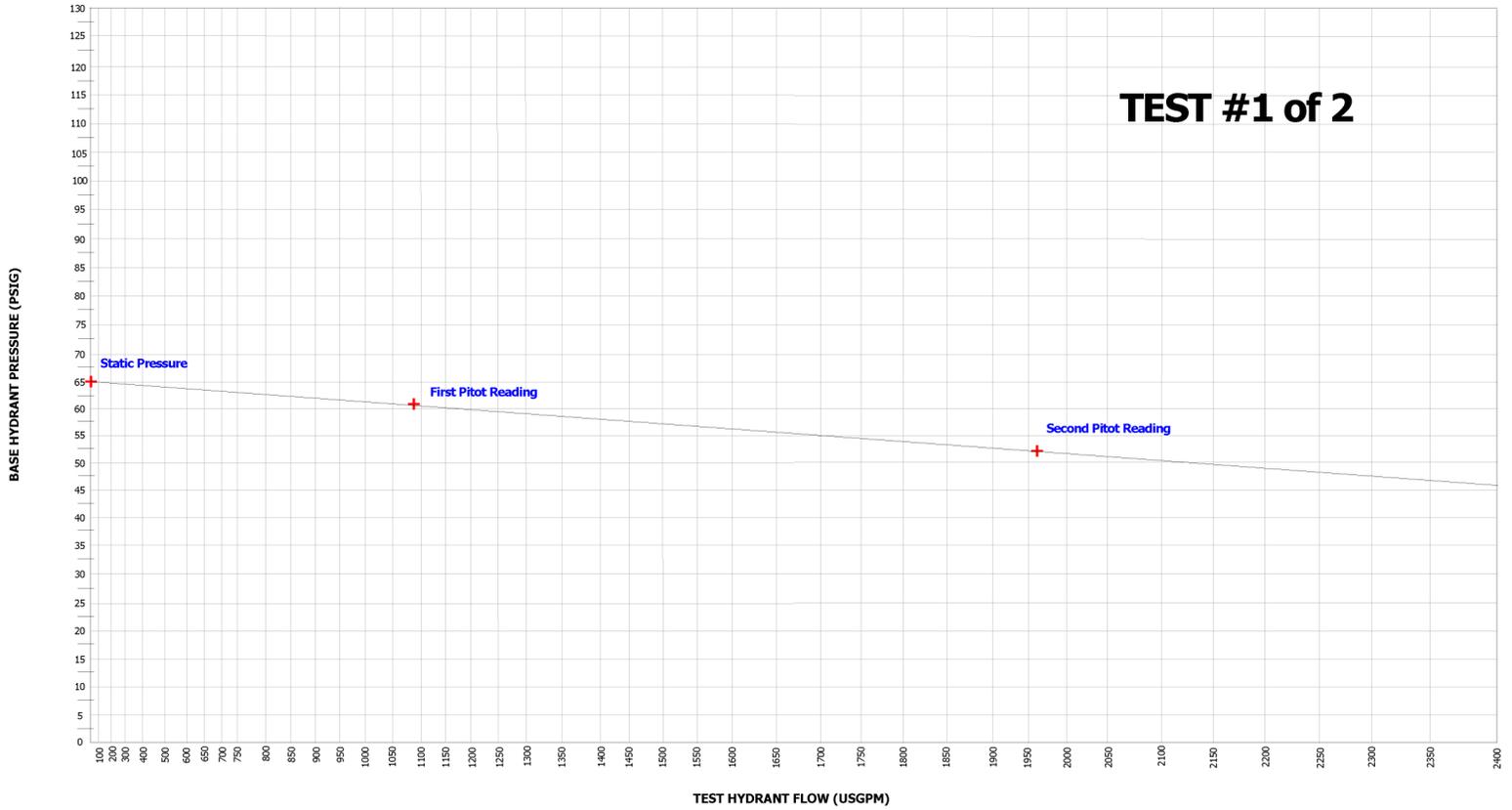
Table 1 - Hydrant Flow Data	
Location	329 Frances Avenue
Static Pressure	70 psi
Residual Pressure During Test Flow	66 psi
Test Flow Rate	1,186 USGPM (74.8 L/s)
Theoretical Flow @ 20psi	4,641 US GPM (292.8 L/s)
Location	Green Road
Static Pressure	65 psi
Residual Pressure During Test Flow	61 psi
Test Flow Rate	1,087 USGPM (68.6 L/s)
Theoretical Flow @ 20 psi	4,018 USGPM (253.5 L/s)

Table 2 - Hydrant Flow Data	
Hydrant ID	SD01H020
Location	301 Frances Avenue
Test Date	24/08/2016 12:58
Static Pressure	72 psi
Residual Pressure During Test Flow	68 psi
Test Flow Rate	1,120 IGPM (84.9 L/s)
Theoretical Flow @ 20 psi	4,475 IGPM (339.1 L/s)
Hydrant ID	SD01H021
Location	311 Frances Avenue
Test Date	24/08/2016 13:09
Static Pressure	74 psi
Residual Pressure During Test Flow	68 psi
Test Flow Rate	1,010 IGPM (76.5 L/s)
Theoretical Flow @ 20 psi	3,308 IGPM (250.6 L/s)
Hydrant ID	SD01H022
Location	311 Frances Avenue
Test Date	24/08/2016 12:49
Static Pressure	72 psi
Residual Pressure During Test Flow	68 psi
Test Flow Rate	1,150 IGPM (87.1 L/s)

Theoretical Flow @ 20 psi	4,475 IGPM (348.1 L/s)
Hydrant ID	SD01H030
Location	Green Road
Test Date	18/07/2016 10:34
Static Pressure	80 psi
Residual Pressure During Test Flow	74 psi
Test Flow Rate	1,050 IGPM (79.6 L/s)
Theoretical Flow @ 20 psi	3,641 IGPM (275.9 L/s)
Hydrant ID	SD01H091
Location	Green Road
Test Date	18/07/2016 10:33
Static Pressure	80 psi
Residual Pressure During Test Flow	74 psi
Test Flow Rate	1,250 IGPM (94.7 L/s)
Theoretical Flow @ 20 psi	4,334 IGPM (328.4 L/s)



FIRE HYDRANT FLOW TEST RESULTS



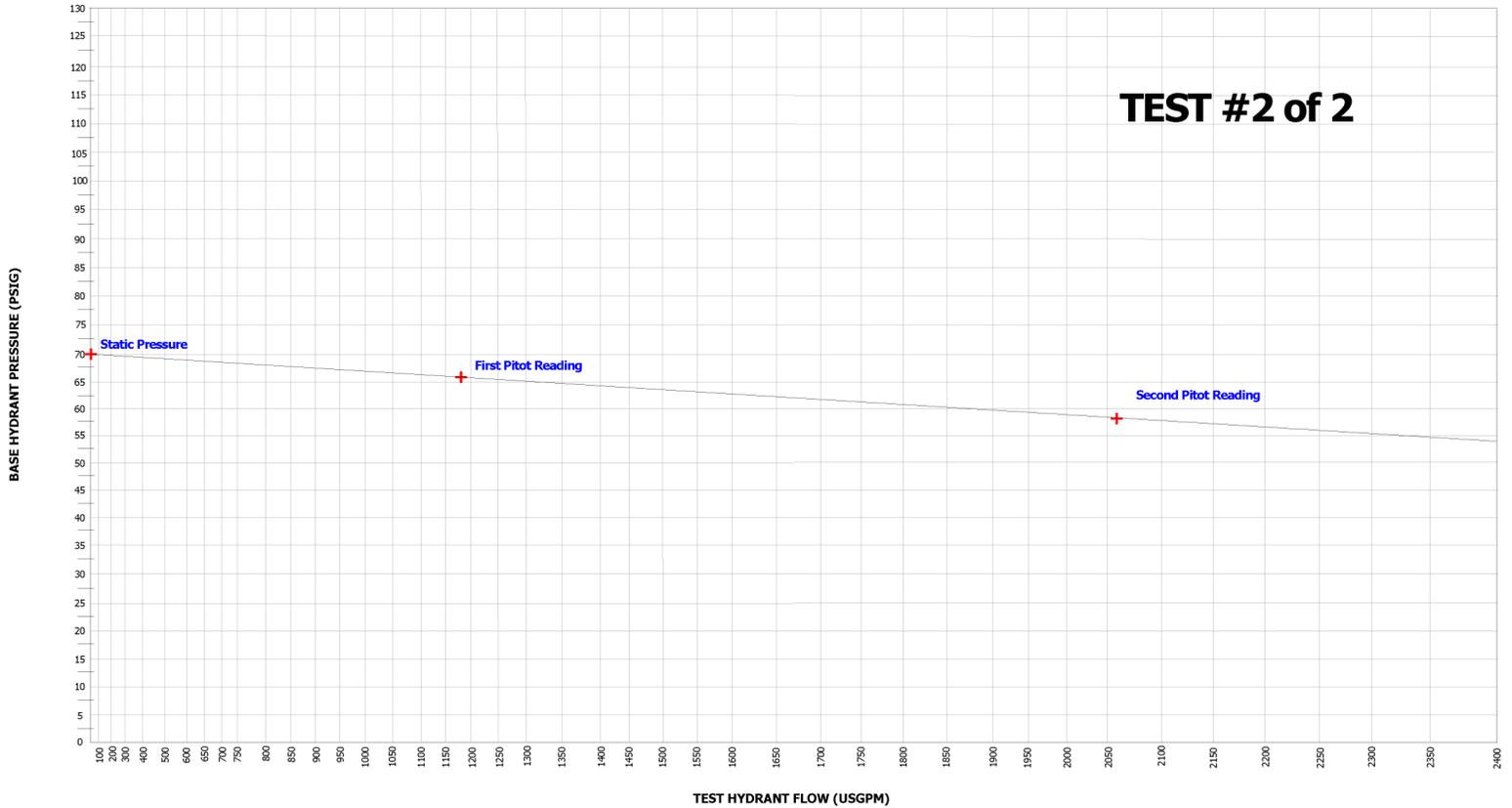
No. of Ports Open	Port Dia. (in)	Pitot Reading (psig)	Pitot Conversion (usgpm) Conversion Factor = 0	Residual Pressure (psig)
1	2.50	42	1087	61
2	2.50	34/34	1956	52
THEORETICAL FLOW @ 20psi			4018	

Test Date	19 September 2017
Test Time	1:15pm
Pipe Diameter (in)	Unknown
Static Pressure (psig)	65

SITE INFORMATION	
Site Name or Developer Name	Not Provided Engineer: S. Llewellyn & Associates
Site Address/Municipality	Green Road & Frances Avenue, Hamilton
Location of Test Hydrant	Corner of Green Road & North Service Road
Location of Base Hydrant	Green Road, 1st South of Frances Avenue
Comments	Testing has been completed in accordance with NFPA-291 guidelines wherever and whenever possible and practical. Conversion factors for pitot tube readings have been used depending on hose nozzle internal design and installation profile. Refer to attached cover letter for additional information.
Verified By	 Mark Schmidt



FIRE HYDRANT FLOW TEST RESULTS



No. of Ports Open	Port Dia. (in)	Pitot Reading (psig)	Pitot Conversion (usgpm) Conversion Factor = 0	Residual Pressure (psig)
1	2.50	50	1186	66
2	2.50	38/38	2068	58
THEORETICAL FLOW @ 20psi			4641	

Test Date	19 September 2017
Test Time	1:45pm
Pipe Diameter (in)	Unknown
Static Pressure (psig)	70

SITE INFORMATION	
Site Name or Developer Name	Not Provided Engineer: S. Llewellyn & Associates
Site Address/Municipality	Green Road & Frances Avenue, Hamilton
Location of Test Hydrant	In Front of 329 Frances Avenue
Location of Base Hydrant	Frances Avenue, 1st East of Green Road
Comments	Testing has been completed in accordance with NFPA-291 guidelines wherever and whenever possible and practical. Conversion factors for pitot tube readings have been used depending on hose nozzle internal design and installation profile. Refer to attached cover letter for additional information.
Verified By	 Mark Schmidt

APPENDIX B: Site Plan and Engineering Drawings

- *Site Plan prepared by KNYMH Inc.*
- *Servicing Plan prepared by Lanhack Consultants Inc.*



CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND JOB CONDITIONS BEFORE PROCEEDING WITH WORK.
 ALL DRAWINGS MAY BE SUBJECT TO CHANGE DUE TO COMMENTS FROM MUNICIPAL DEPARTMENTS AND OTHER AGENCIES WITH AUTHORITY.
 ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECTS AND MUST BE RETURNED AT THE COMPLETION OF THE WORK.
 THE CONTRACTOR WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED FOR CONSTRUCTION MUST ASSUME FULL RESPONSIBILITY AND BEAR COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM HIS OR HER WORK.

KEY TO DETAIL LOCATION

No.	DETAIL NUMBER
No.	DRAWING SHEET NUMBER

DRAWING SETS ISSUED	No.	DATE (DD.MM.YY)	BY
SITE PLAN APPROVAL	1	19.12.2018	MB

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

REVISIONS TO DRAWING	No.	DATE (DD.MM.YY)	BY
NOT FOR CONSTRUCTION			

BUILDING PERMIT NUMBER:
 NOT FOR CONSTRUCTION WITHOUT PERMIT

KNYMH
 ARCHITECTURE • SOLUTIONS

KNYMH INC.
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PROJECT NORTH

PROFESSIONAL ASSOCIATION OF ARCHITECTS OF ONTARIO
 REG. NO. 123456789
 REG. NO. 123456789

NHDG

WATERFRONT TRAILS PH 3
 FRANCES AVE
 STONEY CREEK, ONTARIO

DRAWING SHEET TITLE:
SITE PLAN

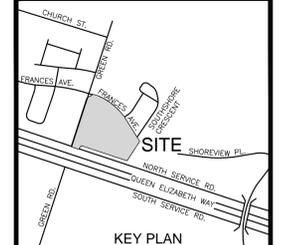
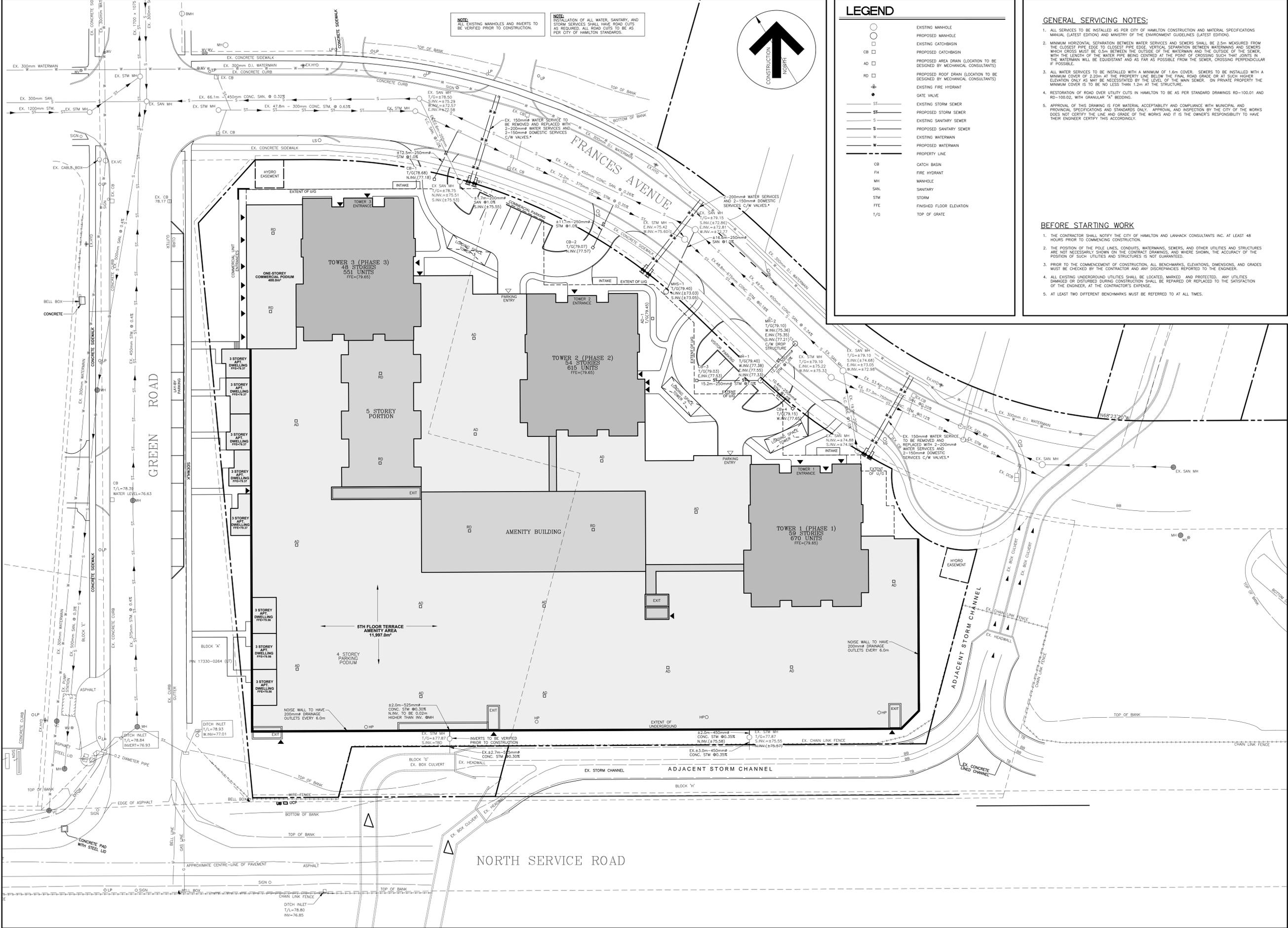
DRAWING SCALE: 1:300
 PROJECT NUMBER: 17305

DRAWN BY: [Name] CHECKED BY: [Name]
 DRAWING VERSION: [Version]
 PLOT DATE: [Date]

DRAWING SHEET NUMBER:
SP1

TIMESAVE 2018-12-19 10:28:50 PM FILEPATH: C:\2018\17305 - Waterfront Trails Phase 3.dwg Drawing: 17305 - SP1.dwg
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1 SITE PLAN
 SP1 1:300



Contractor must verify all dimensions on the Project Site and report any discrepancies before proceeding with the Work.

This drawing is a part of the Contract Documents and is to be read in conjunction with all other Contract Documents.

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SOURCE
EXISTING BOUNDARY SURVEY AND TOPOGRAPHICAL INFORMATION OBTAINED FROM S.T. McCREEN LTD., PLAN DWG. No. 32505, DATED MAY 31, 2011.

Revision Record

No.	Description	Date (m/d/y)
A	ISSUED FOR SPA	12/18/18

Issue Record

NOT FOR CONSTRUCTION

LANHACK Consultants Inc.
Consulting Engineers
1709 Upper James Street
Hamilton, ON L8B 1K7
Tel: (905) 777-1454
Fax: (905) 536-8142

Waterfront Phase 3

310 Frances Avenue
Hamilton, Ontario

Date: December 2018
Drawn By: TV
Chkd By: SMP
Scale: 1:400

Servicing Plan

Project No.: 17091 Drawing No.: C2-1 Rev.: A
Plot Date: 12/19/18
14201917091 - Servicing Plan 3 HED/CMA
17091_C2-1 Grading Plan.dwg

ENVIRONMENTAL NOISE IMPACT STUDY

“WATERFRONT TRAILS PH 3” 310 FRANCES AVENUE CITY OF STONEY CREEK NOW THE CITY OF HAMILTON

Prepared for:

**New Horizon Development Group
69 John Street South
Suite 400
Hamilton, ON
L8N 2B9**

Prepared By:



**Melissa MacLean
Vice President**

**Our File No: 2018-1073
November 2018**

**dBA Acoustical Consultants Inc.
P.O Box 32059
1447 Upper Ottawa
Hamilton, ON
L8W 3K0**

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1.0 INTRODUCTION

dBA Acoustical Consulting Inc. has been retained to provide a noise impact study on behalf of New Horizon Development Group for the proposed mixed use “Waterfront Trails PH 3” also known as 310 Francis Avenue, located at the corners of Green Road, North Service Road and Frances Avenue, Stoney Creek, ON. The purpose of the study is to determine the noise impact from the QEW and North Service Road vehicular traffic that may impact the proposed residential buildings as required for site plan approval for the City of Hamilton.

Proposed for the development are three separate towers totaling 1836 residential units with a 1-storey commercial podium. Tower 1- a 59 storey building consisting of 670 units. Tower 2- a 54 storey building consisting of 615 units and Tower 3- a 48 storey building consisting of 551 units. These towers will sit within a 5-storey parking structure with a 5th-storey rooftop terrace. This study will detail the noise impact relative to the site plan and recommend noise control measures necessary (if applicable) to meet MOE Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning guidelines while satisfying the planning requirements of the City of Hamilton.

Vibration is not considered as there are no heavy industry or railway lines within the required setback distances of 300m. CN/CP Rail is located 585m outside the setback requirements for rail therefore is not a concern with noise. Aircraft is not a concern as the development is located outside the NEF 25 contour of the any area Airports.

2.0 SITE DESCRIPTION

The proposed three tower residential development property is located on the north corner of North Service Road, east of Green Road, and south of Frances Ave, Stoney Creek, ON.

The North Service Rd is a 2-lane roadway running east and west with a posted speed of 80 km/hr and is a heavy truck route located approximately 45m south of the proposed development.

The QEW is a 6-lane is the major traffic noise source, running east-west, located approximately 140m south of the proposed development with a posted speed limit of 100 km/hr. To the west of the proposed development, along the QEW and the North Service Rd. are 5.5m noise barriers, that shield a portion of the QEW and North Service Rd traffic noise at the proposed development. To the west of the proposed site is a small 2 storey commercial building on Green Road and 2.5 storey residential townhouses and a 5.5m noise barrier at the rear yard amenity spaces abutting the North Service Rd as [previously stated. To the north is Lake Ontario, a large 18 storey apartment condo building and 2.5 storey townhouses. To the east are 2.5 storey townhouses with a 4.5m rear yard noise barrier abutting the North Service Road. Further east is Millen Road with an overpass on the QEW. Site Location is attached as Figure 1.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The Ministry of Environment (MOE) specifies limits for road noise relative to new residential developments. The MOE Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

TABLE1- Road Traffic Sound Levels Limits	
Time Period	Leq (dBA)
07:00 – 23:00 (16 hr.)	55 Outdoor Living area
07:00 – 23:00 (16 hr.)	55 Plane of Window
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom window

Where noise levels estimated at the Plane of the Window (POW) are equal to or less than the values listed in Table 1, no noise control measures are required. Where noise levels exceed Table 1 values, the following action is required:

TABLE 2 –Noise Control Requirements		
Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	56 to 60	Warning Clause Type “A”
	> 60	Barrier & Warning Clause Type “B”
07:00 – 23:00 Daytime (POW)	>55	Provision for A/C, Warning Clause “C”
	>65	Central A/C, Warning Clause “D”
	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50	Provision for A/C and Warning Clause Type “C”
	> 60	Building Component Specification
	> 60	Central Air and Warning Clause Type “D”

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet Table 3 indoor sound level limits.

TABLE 3 - Indoor Road Sound Levels Limits	
Indoor Location	Leq (dBA)
	Road
Living/Dining 7:00 – 23:00	45
Bedroom 23:00 - 07:00	40

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for QEW and North Service Road, the main road noise sources in the proposed site area. The 2016 AADT road traffic volumes for the QEW was sourced from the Ministry of Transportation Traffic Volumes on Demand website. The 2016 AADT road traffic volumes for North Service Road was sourced from the City of Hamilton AADT Transportation Data Management System Online Map. See Appendix “A”.

The MOE computer program STAMSON version 5.04 was used to carry out prediction calculations (See Appendix “A”). Traffic data is summarized in Table 4. The daytime/nighttime volume ratios relative to the QEW is calculated using a 24 hr assessment as required by the MOE and City of Hamilton and the North Service Road is calculated using a 90/10 split and a 16/8 hr assessment required by the MOE.

The percentage of annual growth for the QEW was figured at 2.0% over 12 years. The AADT (Annual Average Daily Traffic) volumes used are reflective of the worst-case scenario. Truck volumes were factored at 6.0% medium and 14.0% heavy of the total vehicle volumes for each roadway segment. Calculated noise levels were modeled at 18 receptor locations representative of the Plain of the Window (POW) of the building facade of the three towers at specific storeys. (See Figure 3 Receptor Locations).

The percentage of annual growth for the North Service Road was figured at 2.0% over 12 years. The AADT (Annual Average Daily Traffic) volumes used are reflective of the worst-case scenario. Truck volumes were factored at 2.0% medium and 2.0% heavy of the total vehicle volumes for the roadway segment. Calculated noise levels were modeled at 3 receptor locations representative of the Plain of the Window (POW) of the building facade of Tower 1 at specific locations. The North Service Road, as confirmed by the attached Stamson calculation sheets, will not have a significant acoustical impact on the proposed development as the levels are 10 dBA lower than traffic noise levels from the QEW. Area roadways have no acoustical impact on the proposed site due to lower speed and traffic volumes. (See Figure 3 Receptor

Locations).

TABLE 4 – Future Road Traffic Volumes			
QEW	AADT 150921 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
24 Hour	117718	12074	21129
North Service Road	AADT 8997 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	7775	162	162
Night	862	18	18

The following Table 5 represents the free field noise levels of future road traffic from the QEW at 18 receptor locations.

TABLE 5 – Predicted Future Traffic Noise for the QEW (dBA)	
Location	24 HOURS
R1- Tower 1 – South Façade First Floor	76.0 dba (20.0m)
R2- Tower 1 – South Façade 19 Floor	77.0 dba (58.0m)
R3- Tower 1 – South Façade Top Floor	77.0 dba (117.0m)
R4- Tower 1 – East/West Façade First Floor	73.0 dba (20.0m)
R5- Tower 1 – East/West Façade 19 Floor	74.0 dba (58.0m)
R6- Tower 1 – East/West Façade Top Floor	74.0 dba (117.0m)
R7- Tower 2 – South Façade First Floor	73.0 dba (20.0m)
R8- Tower 2 – South Façade 19 Floor	74.0 dba (58.0m)
R9- Tower 2 – South Façade Top Floor	74.0 dba (132.0m)
R10- Tower 2 – East/West Façade First Floor	70.0 dba (20.0m)
R11- Tower 2 – East/West Façade 22 Floor	71.0 dba (66.0m)
R12- Tower 2 – East/West Façade Top Floor	71.0 dba (132.0m)
R13- Tower 3 – South Façade First Floor	72.0 dba (20.0m)
R14- Tower 3 – South Façade 22 Floor	74.0 dba (66.0m)
R15- Tower 3 – South Façade Top Floor	74.0 dba (132.0m)
R16- Tower 3 – East/West Façade First Floor	69.0 dba (20.0m)
R17- Tower 3 – East/West Façade 19 Floor	70.0 dba (57.0m)
R18- Tower 3 – East/West Façade Top Floor	71.0 dba (132.0m)

The following Table 5A represents the free field noise levels of future road traffic from the North Service Road at specific receptor locations to confirm that the North Service Road will have no significant acoustical impact on the proposed development.

TABLE 5A – Predicted Future Traffic Noise for the North Service Road (dBA)		
Location	07:00 – 23:00	23:00 – 07:00
R1- Tower 1 – South Façade First Floor	61.0 dba (20.0m)	54.0 dba (20.0m)
R2- Tower 1 – South Façade 19 Floor	62.0 dba (58.0m)	55.0 dba (58.0m)
R3- Tower 1 – South Façade Top Floor	62.0 dba (177.0m)	55.0 dba (117.0m)

The following Table 5B represents the mitigated noise levels for the 5th Floor Rooftop OLA with a 3.0m concrete noise barrier.

TABLE 5B – Mitigated Noise Levels 5th Floor Rooftop OLA 4.5m Concrete Noise Barrier (dBA)	
Location	07:00 – 23:00
5 th Floor Rooftop OLA 4.5m Noise Barrier	56.0 (15.0m)

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

Calculated road noise levels for the proposed development exceed the 55 dBA daytime criteria outlined in Table 1. The proposed tower designs included standard balconies for all units for the front and back facades. All balconies less than 4m in depth and are not considered OLA’s (Outdoor Living Areas) and as such, no mitigation will be required.

A fifth-floor outdoor amenity terrace space (OLA) is proposed for this development. Mitigation measures are required to mitigate the noise levels to achieve Table 1 daytime noise criteria. Road noise levels for the proposed fifth floor terrace and amenity space exceed the 55 dBA daytime criteria and as such a Warning Clause Type “A” is required to be inserted into all Offers of Purchase of Lease for all units. A 4.5m concrete wall extending from the south parapet will suffice with 3.0m return ends. Material specification of a continuous concrete noise wall exceeds a minimum surface density be 20kg/m² and free of gaps and cracks within or at the return ends. See Figure 4 Noise Barrier Locations.

4.2 INDOOR NOISE LEVELS

Calculated nighttime road noise levels at the Plane of Window (POW) exceed the 50 dBA criteria outlined in Table 1 for indoor space for residential units exposed to the QEW. Specific building components (walls, windows, doors etc.) are required and confirmed using the STC (Sound Transmission Class) method. Building design specifications were not made available and STC value calculations (Sound Transmission Class) method are summarized in Table 6 following.

TABLE 6 – Recommended Door and Window Construction		
LOCATION	STC To Be Used	Wall STC
All South & East & West Facing Units		
Bedroom	36	EW4
Living room	36	EW4
All Other Units		
Bedroom	26	OBC
Living room	26	OBC

5.0 VENTILATION / WARNING CLAUSES

Ventilation and warning clause requirements are required for this project as noted in Table 7 following.

TABLE 7 - Ventilation and Warning Clause Requirements All Buildings		
LOCATION	VENTILATION	WARNING CLAUSE
South & East & West Facing Units	A/C,	Warning Clause "D"
5 th Floor OLA – All Units	NA	Warning Clause "A"

TYPE A: All Buildings

"Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment's noise criteria."

TYPE D: All Buildings

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment's noise criteria."

6.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures are required to satisfy the indoor and outdoor noise level criterion:

- Central Air Conditioning as recommended in Table 7 for all Buildings all units.
- Specific Window, Door, and Wall construction as recommended in Table 6.
- Registered Warning Clause Type "D" on title for specific residential units in Table 7.
- EW4 for all south, east, and west facing residential units as recommended in Table 6.
- Registered Warning Clause Type "A" for the OLA for all residential units in Table 7.
- It is recommended that a qualified acoustical consultant certify that the required noise control measures have been incorporated into the builder's plans prior to issuance of a building permit.
- It is recommended that a qualified acoustical consultant certify that the required control measures have been properly installed prior to an occupancy permit.

7.0 CONCLUSIONS

dBa Acoustical Consulting Inc. has provided a noise impact study on behalf of New Horizon Development Group for the proposed "Waterfront Trails PH 3" also known as 310 Francis Avenue, located at the corners of Green Road, North Service Road and Frances Avenue, Stoney Creek, ON.

This noise study determined the noise impact from the QEW and North Service Road vehicular traffic that impacts the proposed residential buildings and recommend noise control measures necessary to meet MOE Publication NPC-300 entitled "Stationary & Transportation Sources-Approval & Planning guidelines while satisfying the planning requirements of the City of Hamilton. Noise mitigation measures are required.

FIGURE 1 SITE PLAN



FIGURE 2 SITE PLAN

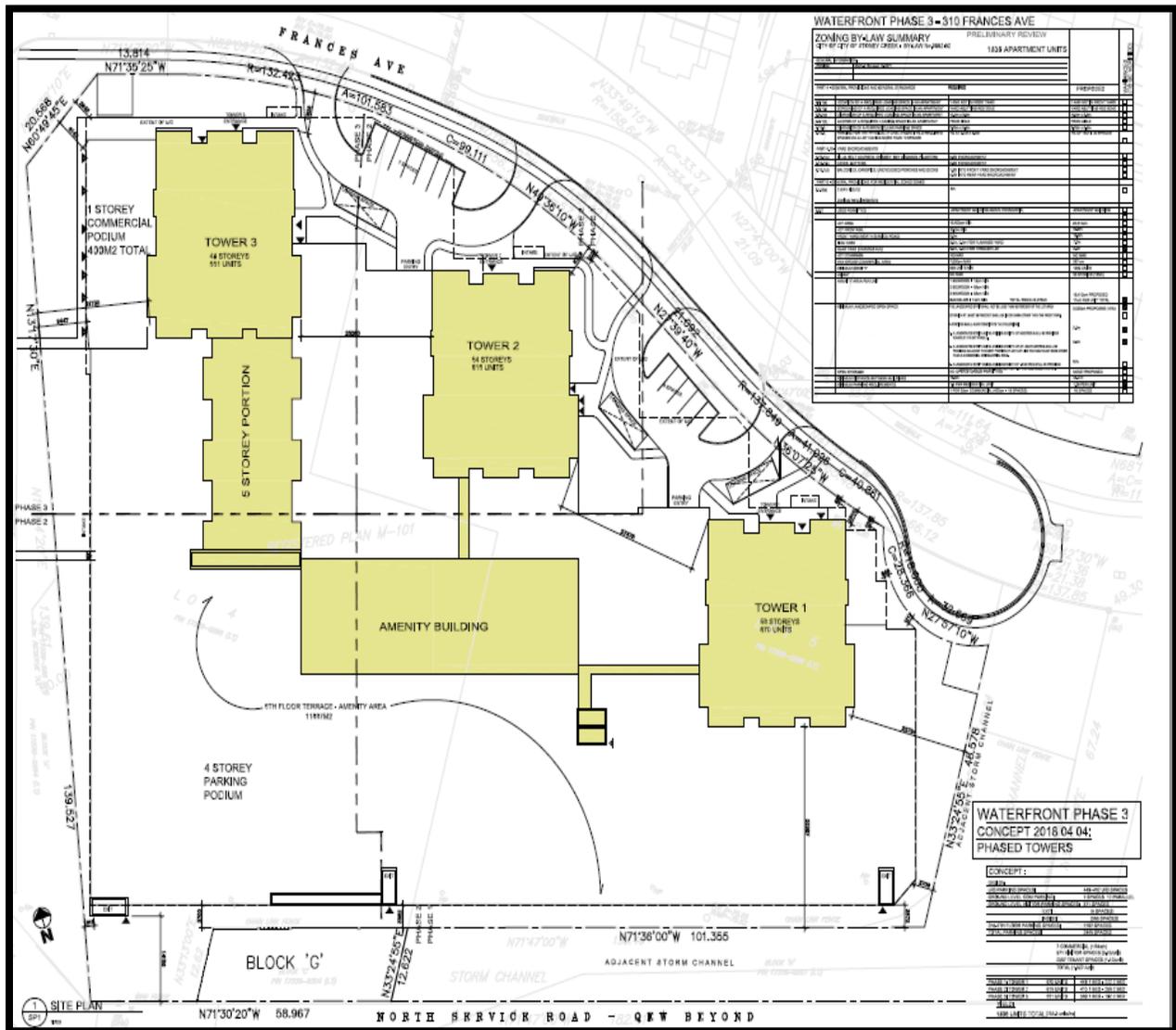


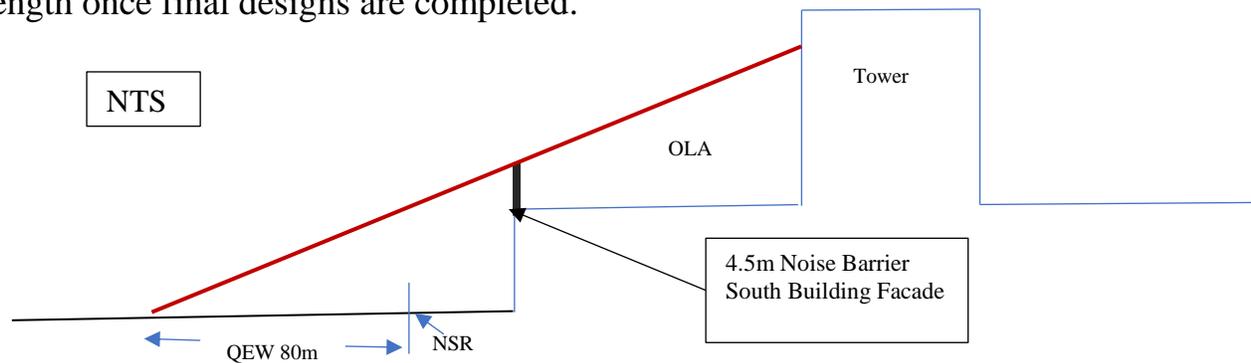
FIGURE 3 RECEPTOR LOCATIONS



FIGURE 4
NOISE BARRIER LOCATIONS

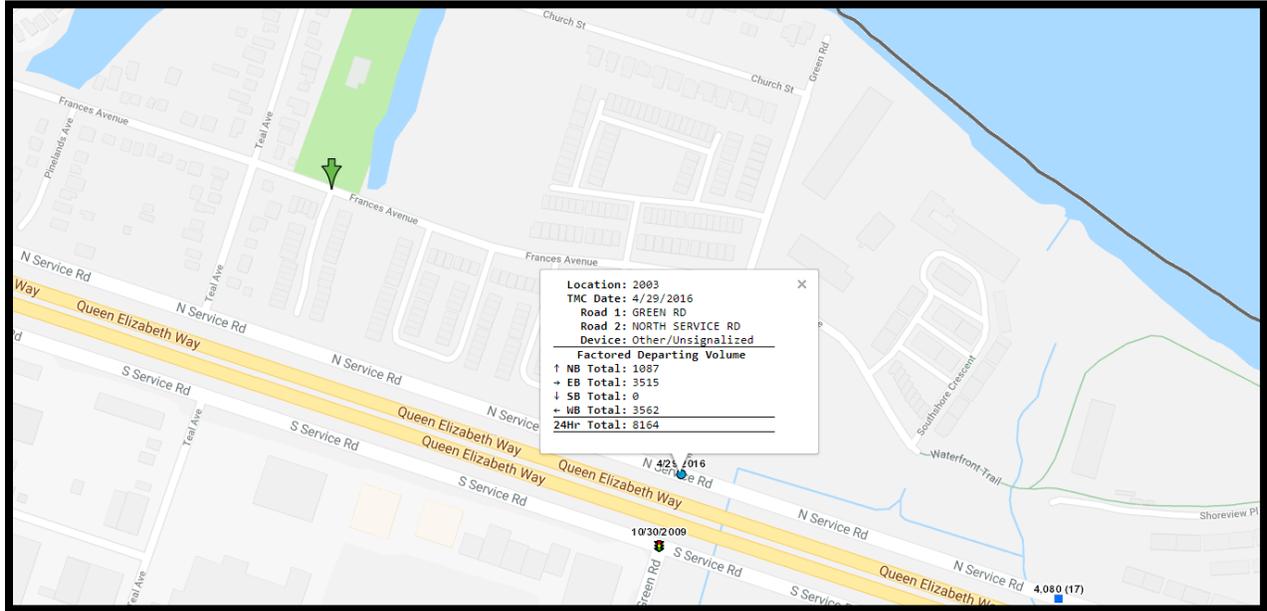


Note: Red line represents the 4.5m height noise barrier that will be constructed of concrete extending from the parapet walls to the south, east, and west. The east and west wing walls will be staged to a minimum 3.0m height wall and confirmed length once final designs are completed.



APPENDIX "A"

2016 City of Hamilton Traffic Data



2016 Ministry of Transportation QEW Traffic Data

Highway	Location Description From	Location Description To	Dist. (KM)	2016 AADT
QEW	FORT ERIE-GODERICH ST-PEACE BRIDGE PLAZA	CENTRAL AV IC	0.2	14,600
QEW	CENTRAL AV IC	CONCESSION RD IC-1	0.9	18,700
QEW	CONCESSION RD IC-1	THOMPSON RD IC-2	1.0	15,500
QEW	THOMPSON RD IC-2	GILMORE RD IC-5	2.4	17,700
QEW	GILMORE RD IC-5	BOWEN RD IC-7	2.0	24,200
QEW	BOWEN RD IC-7	NETHERBY RD IC-12 NIAGARA FALLS LTS	5.5	25,700
QEW	NETHERBY RD IC-12 NIAGARA FALLS LTS	SODOM RD IC-16	3.2	22,000
QEW	SODOM RD IC-16	LYONS CREEK RD IC-21	6.6	29,000
QEW	LYONS CREEK RD IC-21	MCLEOD RD IC-27	4.4	36,700
QEW	MCLEOD RD IC-27	HWY 420 IC-30	2.9	45,100
QEW	HWY 420 IC-30	THOROLD STONE RD IC-32	2.0	70,400
QEW	THOROLD STONE RD IC-32	MOUNTAIN RD IC-34	2.5	67,400
QEW	MOUNTAIN RD IC-34	HWY 405(WBL)IC-37	2.4	71,000
QEW	HWY 405(WBL)IC-37	GLENDALE AV IC-38	1.3	88,100
QEW	GLENDALE AV IC-38	NIAGARA ST SERVICE RDS	4.8	90,500
QEW	NIAGARA ST SERVICE RDS	NIAGARA ST IC-44	1.2	78,600
QEW	NIAGARA ST IC-44	LAKE ST IC-46	1.6	81,900
QEW	LAKE ST IC-46	ONTARIO ST IC-47	1.3	117,000
QEW	ONTARIO ST IC-47	MARTINDALE RD IC-48	0.7	97,400
QEW	MARTINDALE RD IC-48	HWY 406 IC-49	0.7	74,400
QEW	HWY 406 IC-49	SEVENTH ST IC-51	1.9	97,100
QEW	SEVENTH ST IC-51	JORDAN RD IC-55	4.3	98,100
QEW	JORDAN RD IC-55	VICTORIA AV IC-57	2.8	104,300
QEW	VICTORIA AV IC-57	ONTARIO ST IC-64	6.7	105,100
QEW	ONTARIO ST IC-64	BARTLETT AV IC-68	3.8	99,800
QEW	BARTLETT AV IC-68	MAPLE AV IC-71	2.5	99,300
QEW	MAPLE AV IC-71	CASABLANCA BV IC-74	3.6	107,100
QEW	CASABLANCA BV IC-74	FIFTY RD IC-78	3.5	112,300
QEW	FIFTY RD IC-78	FRUITLAND RD IC-83	5.1	120,300
QEW	FRUITLAND RD IC-83	HAMILTON 20 IC 88-CENTENNIAL PKWY	5.2	119,000
QEW	HAMILTON 20 IC 88-CENTENNIAL PKWY	BURLINGTON ST IC-89	1.6	130,000
QEW	BURLINGTON ST IC-89	EASTPORT RD IC-93 (7189)	4.0	135,000
QEW	EASTPORT RD IC-93 (7189)	HAMILTON HARBOUR ENTRANCE	0.9	149,400
QEW	HAMILTON HARBOUR ENTRANCE	NORTH SHORE BLVD IC 97	2.3	271,300
QEW	NORTH SHORE BLVD IC 97	FAIRVIEW ST IC-99	2.3	161,300
QEW	FAIRVIEW ST IC-99	HWY 403/407 IC-100	1.0	172,900
QEW	HWY 403/407 IC-100	BRANT ST IC 101	0.8	164,300
QEW	BRANT ST IC 101	GUELPH LINE IC-102	1.8	162,100
QEW	GUELPH LINE IC-102	WALKERS LINE IC-105	2.0	195,000
QEW	WALKERS LINE IC-105	APPLEBY LINE IC-107	2.0	190,000

STAMSON CALCULATIONS

STAMSON 5.04 SUMMARY REPORT Date: 14-11-2018 11:08:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rlnserv.te Time Period: Day/Night 16/8 hours

Description: R1-First Floor Residential Free Field

TOTAL Leq FROM ALL SOURCES

(DAY): 60.55

(NIGHT): 54.02

Road data, segment # 1: North Serv (day/night)

```
-----
Car traffic volume : 7755/862 veh/TimePeriod *
Medium truck volume : 162/18 veh/TimePeriod *
Heavy truck volume : 162/18 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

* Refers to calculated road volumes based on the following input:

```
24 hr Traffic Volume (AADT or SADT): 7077
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: North Serv (day/night)

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 20.00 / 20.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.North Serv ! 1.19 ! 60.55 ! 60.55
-----+-----+-----+-----
Total 60.55 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.North Serv ! 1.19 ! 54.02 ! 54.02
-----+-----+-----+-----
Total 54.02 dBA
```

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:16:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1Water.te Time Period: 24 hours

Description: R1 Tower 1 1st Floor Residential South Facade QEW
TOTAL Leq FROM ALL SOURCES: 75.95

Road data, segment # 1: QEW

Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 109.00 m
Receiver height : 20.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 75.95 + 0.00) = 75.95 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq

-90 90 0.09 85.62 0.00 -9.41 -0.26 0.00 0.00 0.00 75.95

Segment Leq : 75.95 dBA

Total Leq All Segments: 75.95 dBA

STAMSON 5.04 SUMMARY REPORT Date: 14-11-2018 11:11:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2nserv.te Time Period: Day/Night 16/8 hours

Description: R2- 19th Floor Residential Free Field

TOTAL Leq FROM ALL SOURCES

(DAY): 61.56

(NIGHT): 55.03

Road data, segment # 1: North Serv (day/night)

```
-----
Car traffic volume : 7755/862 veh/TimePeriod *
Medium truck volume : 162/18 veh/TimePeriod *
Heavy truck volume : 162/18 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

* Refers to calculated road volumes based on the following input:

```
24 hr Traffic Volume (AADT or SADT): 7077
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: North Serv (day/night)

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 57.00 / 57.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.North Serv ! 1.19 ! 61.56 ! 61.56
-----+-----+-----+-----
Total 61.56 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.North Serv ! 1.19 ! 55.03 ! 55.03
-----+-----+-----+-----
Total 55.03 dBA
```

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:18:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R2Water.te Time Period: 24 hours

Description: R2 Tower 1 South 19 floor Facade QEW
Total Leq All Segments: 77.00 dBA

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 109.00 m
Receiver height : 58.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 77.00 + 0.00) = 77.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	85.62	0.00	-8.61	0.00	0.00	0.00	0.00	77.00

Segment Leq : 77.00 dBA

STAMSON 5.04 SUMMARY REPORT Date: 14-11-2018 11:13:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3nserv.te Time Period: Day/Night 16/8 hours

Description: R3- Top Floor Residential Free Field
TOTAL Leq FROM ALL SOURCES (DAY): 61.56
(NIGHT): 55.03

Road data, segment # 1: North Serv (day/night)

```
-----
Car traffic volume : 7755/862 veh/TimePeriod *
Medium truck volume : 162/18 veh/TimePeriod *
Heavy truck volume : 162/18 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

* Refers to calculated road volumes based on the following input:

```
24 hr Traffic Volume (AADT or SADT): 7077
Percentage of Annual Growth : 2.00
Number of Years of Growth : 12.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: North Serv (day/night)

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 117.00 / 117.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.North Serv ! 1.19 ! 61.56 ! 61.56
-----+-----+-----+-----
Total 61.56 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.North Serv ! 1.19 ! 55.03 ! 55.03
```

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:23:50
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R3Water.te Time Period: 24 hours

Description: R3 Tower 1 South Facade Top Floor QEW
TOTAL Leq FROM ALL SOURCES: 77.00 dBA

Road data, segment # 1: QEW

 Car traffic volume : 117718 veh/TimePeriod *
 Medium truck volume : 12074 veh/TimePeriod *
 Heavy truck volume : 21129 veh/TimePeriod *
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 109.00 m
 Receiver height : 117.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: QEW

 Source height = 1.93 m

ROAD (0.00 + 77.00 + 0.00) = 77.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.00	85.62	0.00	-8.61	0.00	0.00	0.00	0.00

SubLeq

 77.00

Segment Leq : 77.00 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:30:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5water.te Time Period: 24 hours

Description: R5 Tower 1 East/West Facade 19 Floor QEW
TOTAL Leq FROM ALL SOURCES: 73.76

Road data, segment # 1: QEW

Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 115.00 m
Receiver height : 58.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 73.76 + 0.00) = 73.76 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq

-0 90 0.00 85.62 0.00 -8.85 -3.01 0.00 0.00 0.00 73.76

Segment Leq : 73.76 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:31:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6water.te Time Period: 24 hours
Description: R6 Tower 1 East/West Facade Top Floor QEW
TOTAL Leq FROM ALL SOURCES: 73.76

Road data, segment # 1: QEW

Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 115.00 m
Receiver height : 117.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 73.76 + 0.00) = 73.76 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq

-0 90 0.00 85.62 0.00 -8.85 -3.01 0.00 0.00 0.00 73.76

Segment Leq : 73.76 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:34:52
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7water.te Time Period: 24 hours
Description: R7 Tower 2 South Facade First Floor QEW
TOTAL Leq FROM ALL SOURCES: 72.91

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 207.00 m
Receiver height : 20.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 72.91 + 0.00) = 72.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.09	85.62	0.00	-12.45	-0.26	0.00	0.00	0.00

```
-----
SubLeq
--
72.91
-----
--
```

Segment Leq : 72.91 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:36:16
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8water.te Time Period: 24 hours

Description: R8 Tower 2 South Facade 19 Floor QEW
TOTAL Leq FROM ALL SOURCES: 74.22

Road data, segment # 1: QEW

 Car traffic volume : 117718 veh/TimePeriod *
 Medium truck volume : 12074 veh/TimePeriod *
 Heavy truck volume : 21129 veh/TimePeriod *
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 207.00 m
 Receiver height : 58.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: QEW

 Source height = 1.93 m

ROAD (0.00 + 74.22 + 0.00) = 74.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	85.62	0.00	-11.40	0.00	0.00	0.00	0.00	74.22

 Segment Leq : 74.22 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:49:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9water.te Time Period: 24 hours

Description: R9 Tower 2 South Facade Top Floor QEW
TOTAL Leq FROM ALL SOURCES: 74.22

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1    Angle2                    : -90.00 deg    90.00 deg
Wood depth                         : 0            (No woods.)
No of house rows                    : 0
Surface                              : 1            (Absorptive ground surface)
Receiver source distance            : 207.00 m
Receiver height                     : 132.00 m
Topography                          : 1            (Flat/gentle slope; no barrier)
Reference angle                      : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 74.22 + 0.00) = 74.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.00	85.62	0.00	-11.40	0.00	0.00	0.00	0.00

```
-----
SubLeq
-----
--
74.22
-----
--
```

Segment Leq : 74.22 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:55:41
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10water.te Time Period: 24 hours
Description: R10 Tower 2 East/West Facade First Floor QEW
TOTAL Leq FROM ALL SOURCES: 69.78

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 212.00 m
Receiver height : 20.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 69.78 + 0.00) = 69.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

```
-----
--
-0      90      0.09   85.62    0.00 -12.56   -3.27    0.00    0.00    0.00
69.78
```

Segment Leq : 69.78 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:57:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rllwater.te Time Period: 24 hours
Description: R11 Tower 2 East/West Facade 22nd Floor QEW
TOTAL Leq FROM ALL SOURCES: 71.10

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 212.00 m
Receiver height : 66.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 71.10 + 0.00) = 71.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-0	90	0.00	85.62	0.00	-11.50	-3.01	0.00	0.00	0.00

```
-----
SubLeq
-----
--
71.10
-----
--
```

Segment Leq : 71.10 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 13:58:18
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rl2water.te Time Period: 24 hours
Description: R12 Tower 2 East/West Facade Top Floor QEW
TOTAL Leq FROM ALL SOURCES: 71.10

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 212.00 m
Receiver height : 132.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 71.10 + 0.00) = 71.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-0	90	0.00	85.62	0.00	-11.50	-3.01	0.00	0.00	0.00

```
-----
SubLeq
--
71.10
-----
--
```

Segment Leq : 71.10 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 14:00:17
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rl3water.te Time Period: 24 hours
Description: R13 Tower 3 South Facade First Floor QEW
TOTAL Leq FROM ALL SOURCES: 72.37

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 232.00 m
Receiver height : 20.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 72.37 + 0.00) = 72.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.09	85.62	0.00	-12.99	-0.26	0.00	0.00	0.00

```
-----
SubLeq
-----
--
72.37
-----
--
```

Segment Leq : 72.37 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 14:03:15
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14water.te Time Period: 24 hours

Description: R14 Tower 3 South Facade 19th Floor QEW
TOTAL Leq FROM ALL SOURCES: 73.72

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1    Angle2                      : -90.00 deg    90.00 deg
Wood depth                            : 0              (No woods.)
No of house rows                      : 0
Surface                                : 1              (Absorptive ground surface)
Receiver source distance : 232.00 m
Receiver height                        : 66.00 m
Topography                             : 1              (Flat/gentle slope; no barrier)
Reference angle                        : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 73.72 + 0.00) = 73.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.00	85.62	0.00	-11.89	0.00	0.00	0.00	0.00

```
-----
SubLeq
-----
--
73.72
-----
--
```

Segment Leq : 73.72 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 14:04:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rl5water.te Time Period: 24 hours

Description: R15 Tower 3 South Facade Top Floor QEW
TOTAL Leq FROM ALL SOURCES: 73.72

Road data, segment # 1: QEW

Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 232.00 m
Receiver height : 132.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 73.72 + 0.00) = 73.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-90	90	0.00	85.62	0.00	-11.89	0.00	0.00	0.00	0.00

SubLeq

-90 90 0.00 85.62 0.00 -11.89 0.00 0.00 0.00 0.00 73.72

Segment Leq : 73.72 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 14:19:17
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rl6water.te Time Period: 24 hours
Description: R16 Tower 3 East/West Facade First Floor QEW
TOTAL Leq FROM ALL SOURCES: 69.26

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 237.00 m
Receiver height : 20.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 69.26 + 0.00) = 69.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-0	90	0.09	85.62	0.00	-13.09	-3.27	0.00	0.00	0.00

```
-----
SubLeq
-----
--
69.26
-----
--
```

Segment Leq : 69.26 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 14:22:16
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rl7water.te Time Period: 24 hours
Description: R17 Tower 3 East/West Facade 19 Floor QEW
TOTAL Leq FROM ALL SOURCES: 70.62

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 237.00 m
Receiver height : 57.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 70.62 + 0.00) = 70.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-0	90	0.00	85.62	0.00	-11.99	-3.01	0.00	0.00	0.00

```
-----
SubLeq
-----
--
70.62
-----
--
```

Segment Leq : 70.62 dBA

STAMSON 5.04 NORMAL REPORT Date: 11-10-2018 14:23:14
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rl7water.te Time Period: 24 hours

Description: R18 Tower 3 East/West Facade Top Floor QEW

TOTAL Leq FROM ALL SOURCES: 70.62 dBA

Road data, segment # 1: QEW

```
-----
Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: QEW

```
-----
Angle1 Angle2 : -0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 237.00 m
Receiver height : 132.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: QEW

Source height = 1.93 m

ROAD (0.00 + 70.62 + 0.00) = 70.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------	--------

-0	90	0.00	85.62	0.00	-11.99	-3.01	0.00	0.00	0.00	70.62
----	----	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 70.62 dBA

Total Leq All Segments: 70.62 dBA

STAMSON 5.04 SUMMARY REPORT Date: 03-12-2018 14:58:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rlqewola.te Time Period: 24 hours
Description: **5th Floor Rooftop Amenity Space with 4.5m Noise**
TOTAL Leq FROM ALL SOURCES: 55.89 (OLA)

Road data, segment # 1: QEW

Car traffic volume : 117718 veh/TimePeriod *
Medium truck volume : 12074 veh/TimePeriod *
Heavy truck volume : 21129 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: QEW

Angle1 Angle2 : -45.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 80.00 m
Receiver height : 12.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -45.00 deg Angle2 : 45.00 deg
Barrier height : 4.50 m
Barrier receiver distance : 20.00 m
Source elevation : 0.00 m
Receiver elevation : 15.00 m
Barrier elevation : 15.00 m
Reference angle : 0.00

Result summary

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.QEW	! 1.93 !	55.89 !	55.89
Total			55.89 dBA

Comment Summary DA-19-020

DRT Date and Time: **April 24, 2019, 9:00am**
Property Address: **310 Frances Avenue, Stoney Creek**
Agent: **Sarah Knoll, GSP Group**
Jeff Paikin, NHDG
Joe Giacomodonato, NHDG
Mike Foley, NHDG
Natasha Paikin, NHDG
Sarah Knoll, GSP Group Inc. (Planning)
Shem Myszkowski, KNYMH (Architectural)
Wayne Harrison, KNYMH (Architectural)
Marc Begin, KNYMH (Architectural)
Steve Pongracz, Lanhack (Civil Engineering)
Frank Westaway, dBA Acoustics (Noise)
Dan Bacon, RWDI (Wind)
Planner/Facilitator Assigned: **Melanie Schneider**
Previous/Relevant file: **ZAC-08-079, OPA-08-19, 25T-200809**
Internal: **Anita Fabac, Kathy Jazvac, Christie Meleskie (HSR),
Sandra Lucas, Yvette Rybensky, Binu Korah,
Melissa Kiddie, Victoria Brito, Sandra Al-Dabbagh
(Dev. Eng), Alvin Chan, Cllr Pearson, Ana Cruceru**

Proposal: to construct a hybrid tall building composed of three towers having 48, 54, and 59 storeys in height, 2,409 parking spaces within a four storey podium and two levels of underground parking, 400 sq m of commercial space, and a total of 1,836 dwelling units, eight of which within ground-related units. Lands will be accessed from Frances Avenue and will include a rooftop amenity spaces above the podium structure.

Ground units are the only 3 bedrooms – the towers have 1 and 2 br units

- **Meeting to discuss solutions and comments**

Zone Category: Mixed Use Commercial “MUC-4” Zone, Modified
Official Plan Designation: Neighbourhoods

Recommend Conditional Approval: No

Concerns and Recommended Solutions:

- Major revisions to the development are required in order to meet applicable plans and policies. Supporting reports and plans, such as Sun Shadow, Wind Study, Noise Impact Study, SWM Brief, Water Generation Assessment, TIS, Parking Study, have not been supported by staff.
- Applicant is aware that Conditional Approval will not be granted at DRT meeting. Meeting will be structured as a working session to allow for discussions to determine best course of action for this site.

Commenting Agency	Comment/Concern	Req'd Study/Report
Transportation Planning	<ul style="list-style-type: none"> • Formal comments outstanding – will provide comments on TIS after the meeting – no comments on site plan itself as of yet 	<ul style="list-style-type: none"> • Revised Traffic Impact Study • Neighbourhood

	<ul style="list-style-type: none"> • TIS under review – 5 year post-build horizon, expanded study area, mitigation evaluation, review of traffic signal at Frances Ave and Green Road, and improved pedestrian and cycling infrastructure required to be included in Study. Additional comments and revisions may be required • Quick review – quite a few upgrades to roadways, including North Service • May have to redo TIS – to MTO standards which are more stringent • Road works will be required which may include traffic signal installation (Frances Avenue and North Service Road?) – we know there is going to be a HUGE issue with this many issues (Cllr is having signals installed) • Concerned with Green and Frances, to the west and Service • Might be able to look at right in off of Green – but definitely not left out on to Green. • Needs to have all Transportation issues resolved prior to occupancy • Pedestrian cyclists – e/w for major route for water front trail – we need to protect • Neighbourhood Traffic calming • Parking reduction not supported without access to reliable transit infrastructure • 92-367 short term and 918-2295 long term bike parking spaces required • Show all pedestrian facilities on Site Plan • Provide wayfinding info to future residents • MTO doesn't usually allow off the Service Road and Transportation won't and MTO will have to look at it and it probably have a big challenge with them (Tran Plng) • This WILL BE A PHASED (1 tower per) • Right in off Green, Left out on Frances, and Right in and Right out on Service Road 	<p>Traffic Calming Study (pre/post Conditional Approval?)</p> <ul style="list-style-type: none"> • External Works Agreement for road works • Revised TDM – really push transit use • NO LAYBY PARKING ON GREEN • CAN'T SUPPORT PARKING REDUCTION – without transit Sandra – we will have to look at it on a whole – if we don't have enough parking, how is this going to impact the rest of the neighbourhood • We need to make sure there is adequate parking • MS – quoted SR – parking reduction on one site doesn't mean its appropriate for another development • AF – we open to discussion regarding parking reduction without transit provided – need to know how are they getting around without transit available
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	(Applicant)	
Development Engineering	<ul style="list-style-type: none"> • Revised TIS required per Transportation Planning Comments. If upgrades to work network required, External Works Agreement will be used as a Special Condition • Detailed review of Grading, Servicing, Erosion and Siltation Control not completed until development has been Conditionally Approved • Waste Generation Report exceeds allotted density for this development, being 250ppha. The City is in the midst of evaluating infrastructure needs for the Millen Shores area which includes the subject lands. Scope of necessary upgrades will be determined through this Study for the subject lands • Phasing is imperative to allow this development to proceed. 250ppha are permitted to be constructed before sanitary sewer infrastructure is improved. Approximately 300 dwelling units can be accommodated at this time. • Hydrant flow tests not sufficient for scale of development proposed in reference to required fire flow. Hydraulic modelling is being completed by the City • Permanent dewatering is not permitted. • Sanitary – is significantly exceeding – system CANNOT SUPPORT – Millen Shores study includes this site, but is not complete through review – Current CAP – is 190.74 TOTAL as of right based on capacity – If they go with just the 190 units they would not meet the minimum number of units • Even if they would go with 1 Tower – the Phasing plan would still have to be revised to allow only 250 ppl per hectre... • Special Condition – upon completion of Sanitary Services must be completed • Must redirect the flow to the east, rather than to green... then the main trunk needs to be extended under the QEW • If we do it its 5+ years, if they 	<ul style="list-style-type: none"> • Hydrogeological Report for underground parking structure • Revised Functional Servicing Report • Conditions cannot be issued until engineering comments have been addressed • Development premature

<p>Conservation Authority</p>	<ul style="list-style-type: none"> • SWM Brief reviewed and requires compensation treatment. Level 2 quality control required. • Localized flooding from uncontrolled stormwater discharge could come from municipal road easement. Development Engineering to review this item. • Maximum 70% lot coverage should be maintained to limit storm quantity control as most water will be discharged to Stoney Creek Watercourse No. 1 • Proposed development needs to incorporate Bird Friendly Design Refer to Toronto Best Practices guidelines • Existing watercourse on site regulated by HCA – HCA Permit required • Grading design to reflect 2012 “Green Millen Shores Estates Stormwater Management Report” which acknowledges the Regulatory Floodline Plan 	<ul style="list-style-type: none"> • Geotechnical Report for underground parking structure • Revised SWM Brief • Conditions 2(a), 2(c), 3(b), 3(c) • Steve P – has met with them to resolve this issue – Post/Pre is going to match
<p>Building</p>	<ul style="list-style-type: none"> • Confirm lands are merged on title • North Service Road deemed front lot line • Residential on Ground floor not permitted??? (Must be above commercial) <ul style="list-style-type: none"> • Melanie S – would like to see more commercial on ground floor – she would support variance for the main floor residential IF more commercial • 3.0m rear yard setback required to Frances Ave, 0.68m setback proposed (Tower 1) and flankage yard • 55,031sqm amenity space required, 33,169.3sqm proposed, 1,806 sq m of which as combined indoor amenity area • 50% lot coverage required, 25% of which required in front yard. Total 20.8% proposed – AF – this was supposed to be more of the Tower in the park concept – she has concern – MS this will go well into Ana’s comments • 5m landscape strip required adjacent to street, 0.6m min setback proposed along 	

	<p>Frances Ave, 5 m along North Service Road</p> <ul style="list-style-type: none"> • 9 m landscape strip required adjacent to any zone other than commercial or industrial zones. 3.6 m landscape strip proposed along (P5) Zone, otherwise, no landscape strips clearly shown on Site Plan • 2,763 parking spaces required, 2,387 for residential and 22 for commercial proposed. Lay-by parking along Green Road may not be supported and would be subject to an Encroachment Agreement with Public Works. Layby parking is NOT supported • Provide separate accesses to parking for commercial and residential uses – Sandra Lucas – going to be putting people at risk if the commercial access is off Green • Anything in the P5 can't be counted towards the required open space calculation – nor required parking • AF – anything required in the MUC zone needs to be provided within the MUC zone • Sarah – do we include that P5 area with calc for the area • Sarah – landscape striped – yards were reduced – but not the landscape strips were not – MS – are looking at reducing the landscaping strips – supportive of variance 	
<p>Growth Planning</p>	<ul style="list-style-type: none"> • Confirm tenure of development. If three sperate condo corps, joint use agreements would be required • Any encroachments should be shown on necessary plans as they would be detailed in future Draft Plan of Condo applications – for encroachments for balconies too • Provide additional barrier free surface parking • Municipal addresses assigned for each tower and each ground related unit on Green Road. • Consult MTO • Loading – for tower 1- applicant indicated that it would be for drop off uses only 	<ul style="list-style-type: none"> • If there is no phasing – it could be any type of condo application • Are they separate corps per tower? • Where is the snow storage going? • Garbage – underground one – AC's concern – is getting garbage in and out – ensure waste trucks can get in and out

	<ul style="list-style-type: none"> No barrier free for visitors 	
Waste Management	<ul style="list-style-type: none"> Site is eligible for municipal waste collection, given waste generation is within limits Show truck movement on Site Plan 13m turning radii required Road base needs to support 35,000kg Prior to Occupancy, an Agreement for On-Site Collection of Municipal Solid Waste must be executed 18m head approach required for private roads within waste collection route On site parking and snow storage prohibited in waste access route or collection area Internal storage room required that must be well ventilated, rodent proof, and separate from a living space. Collection limit of one garbage bag/container per dwelling unit per week. Size of collection vehicle and frequency shall be determined by dwelling units within each building 	
Public Health	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Pest Control Plan will be required as a Special Condition
Councillor	<ul style="list-style-type: none"> Not in support of development as currently proposed – wants to work with staff and applicant to come up with solution that works for everyone 	<ul style="list-style-type: none"> Snow Storage Sidewalks
Canada Post	<ul style="list-style-type: none"> Internal mail room will be required Provide standard wording in Site Plan Undertaking 	
Forestry	<ul style="list-style-type: none"> Existing municipal trees may be impacted by development 	<ul style="list-style-type: none"> Tree Management Plan Landscape Plan Street Tree planting fee
HSR	<ul style="list-style-type: none"> Lands serviced by trans-cab – will be a challenge to service with just this level of 	<ul style="list-style-type: none"> Conversations are happening about extension of

	<p>current service</p> <ul style="list-style-type: none"> No funding available to accommodate route expansion in 2019. Funding may be re-evaluated in 2020 budget Site will be monitored as part of consideration for future transit plans 	<p>services however not able to discuss at this table.</p>
MTO	<ul style="list-style-type: none"> MTO permit required Provide 14m setback from MTO lands 	<ul style="list-style-type: none"> MTO Permit Site Plan, SWM, TIS, Lighting Plan required for Permit review
Union Gas	<ul style="list-style-type: none"> Existing lines service site, if relocation is required, it shall be at the cost of the developer 	
Planning Comments		
Cultural Heritage	<ul style="list-style-type: none"> Site meets 3 of 10 criteria for archeological potential Pettit family plot may be located on site – so far can't find any evidence that it is here – so caution is to be put on undertaking Arch assessment completed which has determined it is highly unlikely that the family plot is located on the subject lands. No further concerns from a municipal perspective 	<ul style="list-style-type: none"> Caution Note on future Site Plan
Natural Heritage	<ul style="list-style-type: none"> Lake Ontario within vicinity which is identified as a Core Area. Feature is important for migratory birds. Development will have potential impact and needs to be designed in a bird friendly manner (first 12m height is the most critical – however it is important that birds may migrate at a higher level, so they need to be looked at) Existing private trees may be impacted by development proposal Direct lights downwards to avoid attracting migrating birds at night Look to Markham and Toronto for the Bird Friendly guidelines 	<ul style="list-style-type: none"> Bird Impact Assessment Stewardship initiatives (brochure – for entire area) for future residents to show how the new residents can impact and how they can assist to protect the area – some opportunities to put some green roof areas amenities to mitigate the loss of habitat in the area – it allows the functionality

		<ul style="list-style-type: none"> • TPP • Landscape Plan
<p>Parking</p>	<ul style="list-style-type: none"> • Provide additional surface parking spaces for towers • Ground related units to be fully outlined in underground parking plans • Show intuitively located commercial parking spaces • Several parking spaces within parking podium to either be eliminated to adjusted to allow appropriate maneuvering • Provide adequate separation between parking spaces and support columns in parking structure • Concerns with on-street parking as traffic increases through development • On-street parking permits may arise as a result of development, cannot guarantee this will be an sustainable parking solutions • Parking study not supported by staff – proxy site within a different context (transit and road network) • Use a proxy site close to subject lands – consider reaching out to nearby multiple dwellings 	<ul style="list-style-type: none"> • Revised Parking Study – proxy site was not appropriate – based on report today – we cannot support parking reduction • Revised Underground parking plans
<p>Urban Design</p>	<ul style="list-style-type: none"> • Break up podium to allow for ground level court yard • Enhance pedestrian movement through the site • Use Frances Avenue as the main interface with the neighbourhood – activate even further – lining it up with units to create that activity • Parkland faces a blank podium wall, activate this interface • Relocate loading spaces • Confirm intended commercial uses – encourage restaurants, cafes, grocery store – would be beneficial in creating that activity 	<ul style="list-style-type: none"> • Further Sun Shadow review forthcoming • AF – reviewed purpose of DRP vs DRT • AF – discussed creating the opportunity splitting up the massing – and having different levels – • Why they placed the towers where they are – the intent of placing towers –

	<p>(both utility and interest)</p> <ul style="list-style-type: none"> • Break up amenity areas (vertically and horizontally) – look at them as if they were at grade – network of pathways connecting different areas, etc • Introduce ground level amenity areas • Include greenery with all outdoor amenity areas • Pull the tower massing away from the townhouse dwellings and use mid-rise massing as a transition to larger massings • Sun shadow study shows towers will have a consolidated shadow and does not meet our requirements 	<p>mature neighbourhood west of green – shadow impact is lined up and impact in minimized – majority of amenity spaces created is on the north side or covered (shadow from this development – N/A)</p> <ul style="list-style-type: none"> • Away from the highway etc • They are shrinking tower and reducing the 2 bedrooms • They are down to 840 plate • Another level of underground parking
<p>Development Planning</p>	<ul style="list-style-type: none"> • Noise Study to be revised to justify 56dBA levels for amenity area (outdoor living area – 55dBA required) • Site should be designed to use buildings as a natural noise barrier. Limit the use of Noise barriers • Site reviewed against Tall Building Guidelines • Reduce massing of podium – incorporate stepping in podium to match scale of adjacent developments • Step back towers from podium to ease transition • Provide separate accesses between commercial and residential uses • Provide maximum 70m long buildings – approx. 140m long massing proposed • Reduce tower floor plates to 750sqm – 952sqm currently proposed • Revise Wind Study to meet guideline 	<ul style="list-style-type: none"> • Revised Wind Study • Revised Noise Study • Revised site design

	<p>parameters</p> <ul style="list-style-type: none"> • Explain how and where wind mitigation is required – show on Landscape Plans and explain in Study • Staff concerned with some variances proposed including Parking, residential uses on ground floor (without adequate commercial) • Loading spaces to be screened or relocated from the yard • Ensure phasing does not cut off any dwelling units • Show all sidewalks • Expand commercial 	
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The following agencies were circulated and had no comment:

- Hydro One
- Budgets and Finance
- CRTO (Roads and Traffic)
- Recreation
- Hamilton Fire Department
- Community Planning
- Open Space Development
- Parks & Cemeteries
- MPAC
- Bell Canada
- Cogeco Cable
- HWDSB
- HWSSB
- FPSB
- FCSB
- Horizon Utilities

Applicant provided a drawing – it doesn't pull towers south, however there is a change.

Shadow – have a separate meeting to show the video/pictures of the hourly shadow impacts with towers placement – AF interested

Depending on resubmission – may need to come back to DRT Table

AF – appreciate the work already done – still some work to be done, but revised

Sarah – once agreeable outcome – we can discuss the variances.

Planning Committee - INFO report – to provide status update – very productive meetings – this is not the final – we are working together for positive outcome – not a horse race
 Meeting – keep Cllr included – and Urban Design, Transportation, planning, etc



City of Hamilton
Design Review Panel
Meeting Summary – April 11th 2019

Meeting Summary

The Design Review Panel met on **Thursday, April 11th 2019**, in Meeting Room 264, 2nd Floor, City Hall, 71 Main Street West, Hamilton, Ontario.

Panel Members Present:

- Colin Berman**, Brook McIlroy
- Vincent Colizza**, Vincent Colizza Architects, *Chair*
- Robert Freedman**, Freedman Urban Solutions
- Ute Maya-Giambattista**, Fotenn Planning + Design
- Mario Patitucci**, Adesso Design Inc.
- Tim Smith**, Urban Strategies Inc.
- Jackie VanderVelde**, Land Art Design Landscape Architects Inc.
- James Webb**, Webb Planning Inc.

Staff Present:

- Jason Thorne**, General Manager
- Steve Robichaud**, Director and Chief Planner
- Shannon McKie**, Senior Project Manager, Urban Team
- Melanie Schneider**, Planner II, Suburban Team
- Mark Kehler**, Planner II, Urban Team

Others Present:

Presentation #1 Mixed use Development 310 Francis Avenue	Jeff Paikin , New Horizon Development Group Przemyslaw Myszkowski , KNYMH Inc. Sarah Knoll , GSP Group Inc. Brian Roth , GSP Group Inc. Steve Pongracz , Lanhack Consultants Inc. Marc Begin , KNYMH Inc. Wayne Harrison , KNYMH Inc.
Presentation #2 Mixed use Development 804 – 816 King Street West	Michael Spaziani , Michael Spaziani Architect Inc. Matt Johnston , UrbanSolutions Amber Lindsay , UrbanSolutions Charles Wah , Gateway Group

Presentation #3 Mixed use Development 1160 Main Street East	Rick Lintack , Lintack Architects Inc. Ian Koerssen , Lintack Architects Inc. Mario Patitucci , Adesso Design Inc. Spencer Skidmore , AJ Clarke & Associates Ltd. Sarit Chandaria , Tibro Developments Ltd. Savan Chandaria , Tibro Developments Ltd.
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Regrets:

Yasin Visram, Perkins + Will Canada (Panel Member)

Confirmation of Minutes:

Minutes were confirmed.

Declaration of Interest:

Mario Patitucci, Adesso Design Inc. for 1160 Main Street East, Panel Member did not participate in the discussion.

Schedule:

Start Time	Address	Type of Application	Applicant/ Agent	Development Planner
2:45 p.m.	Mixed use Development 310 Francis Avenue	Site Plan DA 19-020	Owner: NHDG (Waterfront) Inc. Agent and Presentation: GSP Group	Melanie Schneider, Planner II
4:00 p.m.	Mixed use Development 804 – 816 King Street West	Official Plan Amendment & Zoning By-law Amendment UHOPA 19-004 & ZAC 19-009	Owner: Gateway Development Group Inc. Agent and Presentation: UrbanSolutions Planning & Land Development Consultants Inc.	Mark Kehler, Planner II
5:00 p.m.	Mixed use Development 1160 Main Street East	Site Plan DA 19-043	Owner: Main Street East Ltd. Agent and Presentation: Lintack Architects Incorporated	Mark Kehler, Planner II

Summary of Comments:

Note: The Design Review Panel is strictly an advisory body and makes recommendations to Planning Division staff. These comments should be reviewed in conjunction with all comments received by commenting agencies and should be discussed with Planning Division staff prior to resubmission.

1. 310 Francis Avenue

Development Proposal Overview

The applicant is proposing a mixed use development consisting of three towers that are 48, 54, and 59 storeys in height, with a shared four storey podium. The proposal contains 1,836 dwelling units and 400 m² (4,306 ft²) of commercial space. A total of 2,438 parking stalls are proposed, including 20 barrier-free spaces for the residential component of the site. Seven parking spaces are proposed for the commercial component. The proposed development will be constructed in three separate phases. Phase 1 consists of the 59 storey tower with 670 dwelling units and a large portion of the amenity area. Phase 2 consists of the 54 storey tower with 615 dwelling units and the remaining balance of the amenity area. Phase 3 consists of the 48 storey tower with 551 dwelling units as well as the five storey dwelling units on top of the parking podium. Portions of the parking podium will be completed in conjunction with the towers they are proposed to support. Two levels of underground parking are also proposed.

In order to facilitate the proposal, Site Plan Control application (File No. DA-19-020) was submitted December 20, 2018 and deemed complete on December 21, 2018. Staff consider the proposal to be transformational with the potential to significantly impact the physical environment functionally and aesthetically. Therefore, the proposal has been referred to the Design Review Panel as part of the review process for the Site Plan Control application.

The subject property is approximately 2.061 ha (5.09 ac) in size and located on the south-western corner of Green Road and Frances Avenue. The property is in the former City of Stoney Creek.

3 Key Questions to the Panel from Planning Staff

1. What is the relationship of the proposal with the height, massing and scale of nearby residential buildings?
2. Does the proposal complement and animate existing surroundings through building design and placement as well as through placement of pedestrian amenities?
3. Does the proposal integrate conveniently located public transit and cycling infrastructure with existing and new development?

Panel Comments and Recommendations

a) Introduction

- The panel provides some insight on the zoning and notes that permissions for this site were granted at a time when tower-in-the-park developments were the predominant form for major residential development. These tower-in-the-park buildings, while often large and monolithic, were tempered by the fact that they were typically surrounded by large areas of open green space. The generous setbacks and large expanses of lawn prevented the towers from overwhelming their surroundings and allowed them to fit in with lower scale residential neighbourhoods. This proposal, however, is responding to the context as if it were in the middle of a dense urban core and has nothing to do with the actual context. The scale of the towers would not seem out of place in downtown Toronto. The scale of the base building is an unusual mix of urban and mixed use street walls combined with large expanses of a blank-wall parking garage, neither of which appear to relate to anything around it (existing or proposed).

b) Overview and Response to Context (Questions 1, 2 & 3)

- There is no Secondary Plan for the area, or detailed guidance on how the site should develop, resulting in a mixed use site with no height or density limits. The panel notes this is an unfortunate scenario that limits the ability to use site plan control to achieve an appropriate development.
- A development that goes to such extremes in terms of height and density to capitalize on the amenities afforded by the waterfront location, with dramatic and negative impacts, should contribute something positive to the area.
- The buildings are way out of scale with the surrounding area, twice the height they should be. The scale does not respond to the car-oriented, suburban context, where there is no public transit. Additionally, the towers do not have regard for the Urban Hamilton Official Plan policies regarding compatibility and shadow impacts. An image in the submission package with a view from across the lake shows that the buildings would dominate the skyline and detract from views of the escarpment.
- The panel notes that the most difficult challenge is the above grade parking, as it is currently consolidated into a massive podium creating large and imposing walls. The podium is out of character with the existing neighbourhood, creating the sense of a fortress, whereas the development should open itself up to the community. The panel recommends breaking the site and podium up into smaller blocks, with one or more streets and/or driveways to help to break up the mass of the podium, make the development more porous and increase active uses at grade.

- Another major issue is the lack of public open space at grade as an amenity for residents and potentially for the broader community. The panel recommends moving some amenities to the ground floor, at grade. There should be open space between the building and the waterfront and a portion of open space adjacent to the woodlot. Boulevards should be much wider than proposed and incorporate wide sidewalks, street trees and cycling facilities.
- The panel notes that the site is within a suburban area with no current access to public transit.

c) Built Form and Character (Question 1 & 2)

- The panel notes the severe shadow impacts on the development to the north of the site and recommends pulling the towers closer to the QEW, while relocating the amenity area more appropriately. At a minimum, the panel suggests shifting the middle tower to the back of the site.
- While not applicable in this area, the City of Hamilton Tall Building Guidelines should be reviewed, and the floorplate sizes reduced to meet the guidelines, as more slender towers would reduce the shadow impacts and decrease the silhouettes when looking across the lake. Floorplates should not be larger than 750 m² (as a best practice) as three massive towers can appear elegant at that size.
- The towers should be located at the three corners of the triangular site to permit more breathing room, achieve more appropriate tower separation distances and improve the views between the buildings.
- The design of the podium is too busy and out of scale with the neighbourhood. As there are not enough uses to cover the walls, the panel recommends looking into adding some retail. The height of the base/podium should be reduced by placing more of the parking underground.
- The balconies are a dominant element of the design; the panel recommends recessing all or most of the balconies to give the towers a cleaner, more elegant look.
- The panel notes that the grade-related residential units are a successful component of the proposal.

d) Site Layout and Circulation (Question 2 & 3)

- Currently, the proposal has very little sense of place. The above-grade parking garage podium creates a massive superblock that will not be inviting for the future tower residents or the existing community. An alternative option would be to divide the development block into two (or even three) separate blocks with interior roads and a central open space (a public square or park). In addition, the internal streets could be lined on both sides with retail and other public uses. Breaking down the superblock into

smaller pieces would also help with the phasing of the development. This scenario would provide many benefits to the future residents and existing community.

- The panel reiterates the importance of at grade open space and recommends reducing the size of the podium to permit more open space and a connection through the site.
- The panel recommends exploring the opportunity to add more retail, extending it to the south to mirror the adjacent development.
- There are some concerns with the ground level treatment along Francis Avenue and the potential for conflicts between pedestrians and vehicles due to the four curb cuts. Cyclists and pedestrians, and those trying to access the multi-use trails, will have issues. Four curb cuts are unacceptable, the panel recommends consolidating the driveway entrances and creating a central courtyard feature or private street through the site with driveways linking to parking areas. A service entrance should be sensitively located to not interfere with pedestrian circulation.
- The panel notes that safety and security within such a massive parking structure will need to be addressed.

e) Streetscape and the Pedestrian Realm (Question 2 & 3)

- Generally, low-rise housing forms along internal streets would help the development relate better to the larger community. Along with reducing the presence of pick-up and drop-off areas along Francis Avenue as noted above, the panel also recommends adding townhouse units at grade to help activate the public realm.

f) Landscape Strategy (Question 2)

- Although there are some nice landscape elements on the podium, the panel recommends more ground related open space, noting it is a key component missing in the design. There are concerns with the proposed amenity areas, although the geothermal is appreciated, the wind study shows many areas of the amenity terrace is not suitable for sitting, thus creating a largely uncomfortable environment. The wind study also used an height of 1.8 m (average male height) but this does not address the impacts to women and children.
- One panel member noted the need for a substantial dog park as typically 25% of units would contain dogs.

g) Sustainability

- The panel encourages the applicant to go for LEED gold if possible. The panel notes that sustainability practices change over time and encourages the applicants to think about the future of the site, e.g., what happens when there may not be a need for so much parking?

Summary

The panel thanks the applicant and design team for a thorough submission package and presentation with abundant information regarding the proposal. The key recommendations include breaking up the podium, adding ground level open space, activating the ground level and slimming the towers. Responding to these key recommendations will help the proposal achieve a more comfortable scale. The panel encourages the applicant to work within the mass and density permissions but to make a greater effort to reduce the negative impacts to the surrounding neighbourhood. These will be landmark buildings within the region, and the site at the ground level should function as a landmark to the community. Given the scale of the development, there should be a greater contribution to the existing neighbourhood.

2. 804 – 816 King Street West

Development Proposal Overview

The applicant is proposing to construct a six storey (19.6 m) mixed use commercial / residential building with 403.45 m² of commercial space at grade, 30 residential dwelling units and 13 vehicle parking spaces.

The subject lands are located within a Design Priority Area (Primary Corridor) and review by the Design Review Panel is required in conjunction with Official Plan Amendment application (UHOPA-19-004) and Zoning By-law Amendment application (ZAC-19-009).

The subject property is located at the northeast corner of King Street West and Paradise Road North and currently contains two one storey commercial buildings and a surface parking lot. The subject lands are located in the Westdale Neighbourhood on King Street West, a Primary Corridor.

Key Questions to the Panel from Planning Staff

1. Does the proposal consider transition in height and density to adjacent residential buildings?
2. Is the proposal compatible with adjacent land uses including matters such as shadowing, overlook, noise, lighting, traffic and other nuisance effects?

3. What is the relationship of the proposal to the existing neighbourhood character? Does it maintain, and where possible, enhance and build upon desirable established patterns, built form and landscapes?

Panel Comments and Recommendations

a) Overview and Response to Context (Questions 1, 2 & 3)

- The panel acknowledges that the site is amongst many that will redevelop in the near future as it is close to the LRT corridor. The panel notes that the City of Hamilton’s Corridor Planning Principles and Design Guidelines requiring a 45-degree angular plane may be overly restrictive when applied to relatively shallow sites like this one, preventing appropriate intensification. One panel member pointed out that the City of Toronto has mid-rise guidelines for shallow lots, where the 45-degree angular plane is measured starting 11 m above grade along rear lot lines.
- Several panel members are pleased with the building mass and inclusion of setbacks and step-backs that help to achieve a good transition to the surrounding properties.

b) Built Form and Character (Question 1, 2 & 3)

- The majority of the panel members are comfortable with the ultimate six storey height along King Street and six storey height at the rear as the design includes step-backs that have been carefully implemented to reduce negative impacts to the existing community. Some panel members struggle with the proposed height and have concerns with the precedent it would set, since an alternative mid-rise angular plane strategy was used (a strategy similar to the City of Toronto) to achieve the built form, a more permissive strategy than the City of Hamilton currently allows. One panel member notes that the site would more comfortably accommodate a five storey building with mechanical penthouse.
- The mechanical penthouse creates the illusion of a seventh storey and visually increases the mass of the building. The panel recommends moving the amenity space to the ground floor and shrinking the mechanical penthouse to reduce the mass visually and reduce the shadow impacts on adjacent properties.
- The panel recommends slightly increasing the height of the first storey to better accommodate retail uses and to achieve a better public realm presence. As the retail opportunities are explored, the panel recommends the option to open the corner of the building to create public space, adding some articulation through hard and soft landscaping. As the site is on a very busy corridor, the retail will help with traffic calming and contribute to a more vibrant streetscape and public realm.

- The majority of the panel members recommend removing the two storey portico at the rear of the site as it interrupts the transition to the surrounding properties and may be intrusive to the neighbours. Some panel members recommend keeping it, as it adds interest and helps with the gradual stepping down to the neighbourhood while reducing the impact of the surface level parking area from the public realm. One panel member notes that change in height from the ultimate six storey building to the two storey portico is quite drastic and could better integrate into the existing network of step-backs, perhaps even adding some building mass to create an “L” shaped building. The panel agrees that it should not incorporate outdoor amenity space if kept and/or redesigned.
- The panel notes that the building is handsome and the simplicity of the material palette is quite successful; however, some panel members recommend continuing the balconies and materiality from the fifth floor to the upper floors for more consistency.
- Some panel members recommend a slight redesign to the rooftop, making an effort to shift the amenity area closer to the street, to reduce the overlook on adjacent properties.
- The balconies at the back of the building could be intrusive, the panel recommends removing them to reduce the overlook to the neighbours.

c) Site Layout and Circulation

- The panel recommends making the entrance for the residential component of the building more distinct from the commercial entrances.
- The panel recommends exploring the opportunity to remove the dedicated right turn lane on King Street and reduce the overall road width if possible. Additionally, there is a conflict with the bi-directional bike lanes and it would be beneficial to try and improve the cycling and pedestrian circulation on and around the site.
- Cycling is a critically important component of the project; there should be a focus on cycling amenities at grade including visitor bike parking and a bike repair room.
- One panel member notes that the parking may be underestimated and that it may put additional pressure on the neighbourhood.

d) Streetscape and the Pedestrian Realm

- The panel notes that there will be a lot of pedestrian traffic and that the streetscape is a very important component of the proposal. Eliminating the right-turn lane would allow for more street trees to help create a more comfortable public realm and add some green buffers.

e) Landscape Strategy

- The panel notes that the 1.5 m wide landscape strip along the north boundary may be insufficient due to the minimal soil volumes and lack of sun in that location. Trees will likely not survive there.
- The panel recommends completing an arborist report for the site, making an effort to preserve the existing trees.

Summary

The panel applauds the design rationale and efforts to create a good transition to the surrounding properties. The panel also appreciates the thorough submission package and detailed presentation. The site is a gateway into the village, moving from the highway onto a local collector road with a more pedestrian oriented environment, and the proposal should reflect this as indicated in the comments provided above.

3. 1160 Main Street East

Development Proposal Overview

The applicant is proposing to construct a seven storey mixed use commercial / residential building with 303.5 m² of commercial space at grade, 75 dwelling units and 24 vehicle parking spaces.

The subject lands are located within a Design Priority Area (Primary Corridor) and review by the Design Review Panel is required in conjunction with Site Plan Control application (DA-19-043).

The subject property is on the south side of Main Street East mid-block between Balmoral Avenue South and Grosvenor Avenue South and currently contains a one storey commercial buildings and a surface parking lot. The subject lands are located in the Delta Neighbourhood, two blocks east of Gage Park.

Key Questions to the Panel from Planning Staff

1. Does the proposal promote quality design consistent with the locale and surrounding environment?
2. Are the service and loading areas buffered to reduce the visual and noise impacts, particularly when located adjacent to residential areas? Do the buffering methods include berms, tree and shrub plantings, noise walls, fences and/or the use of quality construction materials and methods?
3. What is the relationship of the proposal with the height, massing and scale of nearby residential buildings?

Panel Comments and Recommendations

a) Overview and Response to Context (Questions 1, 2 & 3)

- The panel notes that some effort has gone into achieving an appropriate transition to the neighbourhood; however, the mass is a too large and needs some refining to better address the neighbouring properties. Overall, the site is too tight for the building mass proposed due to the negative impacts to the neighbours, lack of buffers and proximity to the front property line.
- The panel notes that the proposal is trying to follow the City of Hamilton’s policies which permit no side setbacks to encourage a continuous street wall along Main Street E; however, the site is unusual in that it is flanked on both sides by the rear lots of adjacent houses and apartment. The panel finds this problematic as providing no rear or side setbacks does not allow for the proposal to properly transition to the surrounding neighbourhood.

b) Built Form and Character (Question 1 & 3)

- The panel recommends including a 2.0 - 3.0 m setback along the side and rear property lines to respond to the existing condition. The panel notes that a separation of less than 2.0 m from the proposed building to an existing building is not ideal and needs to be improved, the edge abutting the neighbours needs some work to help protect the privacy of the existing residents.
- In addition to the setbacks, the panel recommends step-backs on each side of the building to provide a more appropriate transition to the neighbouring properties on Main Street, which are unlikely to redevelop to greater heights. Although there are no strict regulations for step-backs, the existing residences will be facing a wall and the proposal should better respond to the adjacent properties, giving them more space. The panel notes that the building’s circulation elements (elevator and stairs) could remain where they are; however, all storeys above the third should include side step-backs. The top floor should step-back from the street by at least 3.0 m to allow the building to visually appear as a six storey brick structure from Main Street.
- Generally, the materiality and balcony treatments are appropriate, but the panel feels that four cornice lines may be too many and the horizontal and vertical banding is excessive, suggesting a more simplified approach.
- The panel recommends improving the parking area using interesting colours and textures so that it does not feel like the back of a building.

c) Site Layout and Circulation (Question 2)

- As noted above, a landscape strip of 2.0 – 3.0 m is needed along the side and rear lot lines to accommodate adequate soil volumes to ensure healthy tree growth to help buffer the adjacent properties and to help screen the garbage/loading area.
- The panel notes that access to the site would ideally be from a side street.
- The amount of bike parking should be increased, with some included at grade and some in the basement.
- The panel recommends protecting the columns by adding curbing.
- The panel recommends moving the loading area behind the service door to reduce the width of the driveway area under the building.

d) Streetscape and the Pedestrian Realm

- As there will be an LRT stop close by, it is a good location for commercial and the panel recommends including more space for pedestrians along the Main Street frontage as it is a busy road. The panel notes that the 2.0 m sidewalk is acceptable but recommends adding an additional 0.5 m setback (to achieve a total of 1.0 m in addition to the sidewalk). This would create a more comfortable pedestrian environment and the extra space could accommodate a covered patio.

e) Landscape Strategy (Question 2)

- The panel recommends continuing the unit paving across the driveway to brighten up the area. A fun design treatment spanning the sides and ceiling of the driveway portal to enliven the space is also recommended. This can be something that makes a passerby smile rather than ignore it.

Summary

In general, the location is ideal for a mid-rise building and the panel notes that some good thinking has gone into the proposal, although some work is needed to better respond to the neighbouring properties. Providing buffers, refining the massing and improving the public realm are key recommendations. To support commercial development and a vibrant public realm, a more generous streetscape condition is needed.

Meeting was adjourned at 6:30 p.m.

Sent: May 10, 2019 10:55 AM

To: clerk@hamilton.ca

Subject: 7.3 of Planning Committee Meeting

As a resident of the Shoreliner, I am extremely concerned about the high rise buildings proposed in our area. The relief from some of the by laws is disturbing. e.g. reduction of required on site parking spots, frontage to street, traffic flow at peak times.

I trust these items will be covered.

Sincerely

George McCowan

Sent: May 10, 2019 9:18 PM

To: clerk@hamilton.ca

Subject: Re. Reference Item 7.3 Planning Committee meeting in regards Site Plan Application for 310 Francis Ave.

May 10, 2019

To who may concern:

Dear Sir/Madam:

I am writing to you to voice some of my concerns regarding plans to build high rise buildings on 310 Francis Ave.

My concerns are as following:

1. Currently we are already experiencing very limited street visitor parking spaces as there is no availability to municipal parking nearby. I have noticed the parking space issue augments in winter due to snow banks and accumulated snow on the sides of the streets
2. The only exits and entrance to and from this area is via Francis St. and North Service Rd. These are narrow roads and already experience severe congestion due road use from residents of this area and use by highway drivers who divert their routs to avoid highway congestion.
3. The high rise building will block to light all the buildings.
4. This will disrupt the migratory route of the birds.
5. We are already experiencing the wind tunnel effect from two high rise buildings on Green Rd. My research in this area indicates that there may be further issues with wind tunnel effects which may affect not only the residents of this area but also the QEW high way drivers.
6. What impact will addition of so many residents have on water and sewer services?
7. Where will additional of animal defecate?

I hope will consider my concerns very seriously.

Thank you.

Sincerely,

Surabhi

Dear Planning Committee members:

In light of additional information that has been released regarding the site plan application at 310 Frances Avenue in Stoney Creek, as a home-owner directly affected by this massive development I have significant concerns regarding the ability of Councillor Pearson to impartially represent my concerns regarding the infrastructure related issues impacted by this build. Her track record in this regard has been historically unreliable.

To date, Councillor Pearson has not publicly declared any conflict of interest regarding this development. It is imperative that the same scenario that occurred with the 257 Millen Road development not reoccur. For historical context: Councillor Pearson attended meetings with the developer, hosted the developer at a public meeting, met with the affected home-owners at their private residences, then declared a conflict-of-interest (ownership of rental property within 120 metre circulation area of the development) during the Planning Committee decision meeting. Her eleventh-hour disclosure was of questionable timing, leaving the residents without representation at a crucial point in the process. In the current situation, the land-owner at 310 Frances, and myself, are both constituents; this situation also raises questions about unbiased representation.

Given the city-wide implications on both zoning, development, and infrastructure costs related to the 310 Frances Avenue site-plan application, Councillor Pearson's conflicts of interests – real or perceived – need to be disclosed immediately on public record to ensure that the Planning Committee, remainder of Council, and residents are not blind-sided at any point during the current process.

Thank you for your attention to this matter.

Sincerely,

Anna Roberts

Sent: May 11, 2019 10:42 AM

To: clerk@hamilton.ca

Subject: item 7.3 of Planning Committee Meeting

Dear council members

My wife and I are relatively new to this area, we moved in in August 2018, and are quite happy in our current environment. We moved in with the understanding that condominium's were planned for the area. On that note we were quite dismayed in learning about the extent of the construction without any proper pre planning on not only the builders part but as well as the city's.

The 1st concern we have is the lack of parking being made by the builder in the 3 high rises. Not only is there not enough spaces for the residence of the building on their own property but it seems to be a great lack of municipal space available for all the residences in the area. The builder is also asking for a reduction of parking spots on his own property.

We also have concerns regarding water flow and flooding concerns due to minimal surface ground space for percolation.

Wind and shade concerns from the massive towers.

How can this small space support such a build.

The lack of green space around the building with the request for a variance to reduce their green space.

Minimal if any trees at ground level that would grow to any significant size to help reduce the massive carbon footprint.

We hope that council will appreciate the enormous congestion, disruption that this with a number of other projects in the area would create and that proper PUBLIC information and meetings will be provided before any construction begins.

Regards

Stan, Renee Kurak

Sent: May 11, 2019 4:04 PM
To: clerk@hamilton.ca
Subject: Stoney Creek Towers

Dear Sir/Madam: I am writing regarding the proposed towers at 310 Frances. This is definitively a bad idea. First of all parking is already at a premium. At least once but usually twice a year the parking garage in existing high rises need to be cleaned and during this time all vehicles must be parked along the streets. This is already a problem on regular days so you have to realize that with more vehicles it would be impossible to find a spot in this whole area. Next; during wind storms the wind tunnels of the two existing high rises is so strong that it is impossible to walk and with proposed towers it would be much worse affecting vehicles travel on the QEW, even to the extent of possible small ones being flipped over.

The planning department must consider all of the above and also the overflow of traffic on the North Service Road during rush hours is chaotic as it is, notwithstanding extra vehicles.

Sincerely
Zita Petozzi

Sent: May 11, 2019 7:43 PM

To: clerk@hamilton.ca

Subject: 310 Frances Avenue Stoney Creek Development Multi Tower

I oppose this multi tower development as it will literally be in my front yard. As a resident of Frances Avenue, the impact of such a dense population in a small footprint proposed in this development will negatively impact the current quaint, waterfront friendly community. Aside from this, the traffic impact, drain on community resources, etc will be overwhelming. My house faces this proposed development.

Again, please consider this my strong statement of opposition.

Regards,

Tabatha Morris

Sent: May 12, 2019 9:45 AM

To: clerk@hamilton.ca

Subject: Agenda Item 7.3, Planning committee May 14,2019

To Members of Planning Committee,

I am currently a resident of 500 Green Rd. I have many concerns about the proposed 3 condo project under consideration for 310 Frances Ave listed on the agenda for May 14 as item 7.3..

Some of my concerns and objections:

- This area is already a fairly dense urban space this project will not provide sufficient green space, and will cause further erosion of natural habitat for wildlife, i.e. coyotes, foxes which seems contrary to the mission of the Conservation authority caring for Confederation Park. As I walk there I read the signs and they talk about their goal that is to return the area to natural habitats. Bird flight paths will also be affected. As the city has declared a climate change emergency, better protection for the environment as a whole is also part and parcel to that.
- on street parking for the around an additional 500 vehicles will be impossible. Our building, The Shoreliner, has as its only visitor parking the street. I challenge the committee to come and visit our community with pen and paper in hand and figure where we would find an additional 500 on street parking spots.
- This community is only 2 blocks between the QEW and Lake Ontario, there is **no place** to provide this much additional space.
- The traffic on the North Service road already at times is busy making it difficult to enter off of Frances Ave and Drake, and its physical condition is quickly deteriorating.
- The current mix of town homes and smaller height towers such as the recent Senior residence appear to me to be a much better proposal for expansion in the area. The proposed project will have significant impact on the physical environment and the aesthetics. In my opinion it is so out of scale that the 3 towers would appear as a cancerous tumour growing in the middle of our community.
- Frances Ave is part of the Cycle route for the Waterfront trail and all the additional vehicular traffic will impact the safety of both the pedestrians and cyclists
- There is currently no public transit servicing this area.

I would like to see more public meetings concerning this project as it seems to have come onto the radar of the residents fairly recently with little time to react.

Please do not approve this project until give all parties time to ensure the project is the correct one .

Respectfully submitted,
Joan Whitson

Sent: May 12, 2019 10:12 AM
To: clerk@hamilton.ca
Subject: Item 7.3 Planning Committee Meeting

How can the city, in good conscience, approve such a project as the 3 towers at 310 Frances Ave, a total of 161 stories/1826 units in such a small area???

The additional traffic will be massive, and if the requested reduction of 500 parking spaces on the properties is granted, where will these 500 cars park?

Russell & Janet Pape

Sent: May 12, 2019 5:50 PM

To: clerk@hamilton.ca

Cc: Pearson, Maria <Maria.Pearson@hamilton.ca>; Barbara Birch <barbara.birch@cogeco.ca>

Subject: Proposed Three Towers Development 310 Frances Avenue - Opposed to Existing Plan of Development

Good Day,

This is a submission for the Planning Committee Meeting currently scheduled for Tuesday May 14, 2019.

I wish to register my objection to the development at 310 Frances Avenue as it currently appears on the Hamilton Planning Committee minutes and reports as found on their website.

The specifics that I take exception to are as follows:

- The requested reduction of on site parking spots are inadequate and should be made to the 1.5 per suite model or 2,754. The requested 1.3 model is simply inadequate. Street parking in the area is significantly challenging on most days presently. Observing the majority of the cars parked on the driveways of the townhouse complex adjacent to the 310 Frances site shows that most are two car families with one car on the driveway during normal working hours.
- Further the traffic study that states that the increased traffic trips of 556 AM and 666 PM peak periods is simply not credible when considering the existing situation at the peak periods. Additionally the most recent study dated by the developer was taken 5/2/17. This does not include the additional traffic that will be on North Service Road once the additional building currently being completed just east of the break of Frances Avenue and the shore trail.
- The proposed remedial measures clearly state that the current areas available for the necessary turning lanes onto Green Road do not allow for the necessary storage and taper zones by a considerable lower amount. (15.8 M available versus 120 M required)
- The requested reduction to the building set backs appears inadequate on all sides.
- The landscaped open space proposed is dramatically less than the requirements stated and should not be authorized.
- Contrary to the statements from HSR there is currently no practical public transportation option available anywhere in this general area along North Service Road. The vast majority of people use a personal vehicle for every trip.
- Overall, it is obvious to me that the proposed building areas and occupancy density of 1836 units is simply vastly too great for the property size at 310 Frances Avenue. In addition the additional traffic that will result will produce twice daily gridlock given the current Green Road and North Service Road intersection. Personal daily observations at AM and PM peak periods easily support this point. We have all be very fortunate that no deadly accidents have occurred at the Green Road / North Service Road intersection. Again several near misses have been personally observed.

Respectfully submitted for Planning Committee consideration.

Larry Birch, P. Eng.

Sent: May 12, 2019 9:09 PM

To: clerk@hamilton.ca

Subject: REFERENCING: AGENDA ITEM 7.3 PLANNING COMMITTEE MAY 14th, 2019 MEETING

To the Chairman , Council , Planning Committee & Planning Staff

Regarding the planning committee meeting of April 16th – due to a sudden medical situation I was unable to attend that meeting. I was to speak before council regarding my concerns about the proposed development at 310 Francis Ave. I did indicate that I wanted someone else to address my concerns and I know this person did so on my behalf.

However in a subsequent meeting I understand that I was only listed as - Did Not Attend. I take offense to this when others in favor of the development were acknowledged even though they also did not attend. I would like the record to show that my concerns were addressed through others at the meeting.

I would like to re-state my concerns for the proposed development at 310 Francis Ave. so that it is added and properly recorded at the May 14th committee meeting.

I am very concerned about the traffic issues that will happen if these towers are built. There will be no parking available in the area and current residents will be fighting for space.

The traffic will be far too extensive with thousands more cars on our short, narrow streets. There will be a serious safety concern for everyone and a danger to pedestrians , including elderly and children in the area.

I want it to be known that I am very much against this development going in our small community and there are many others that agree

Respectfully
Eleanor Boyle

Sent: May 13, 2019 11:59 AM
To: clerk@hamilton.ca
Subject: 310 Frances Ave

To Members of the Planning Committee and City Councillors,

In light of the upcoming Planning Committee meeting for May 14th, I would like to please make my feelings made known regarding item 7.3 on the agenda.

As a long-time resident - 33 years, I have seen large changes to development in the area. As such, I have been informed many times over that this area is zoned high density. I get that - however the latest "Triple Tower" project proposed is absolutely mind-boggling in scale and consequently in impact on this community. Surely, there has to be some point at which "unlimited density and height" gets recognized as ridiculous and even, in my mind as reckless. Anyone who has visited this area must surely question how our surrounding area could possibly cope with a project of this magnitude. Consider how many more thousands will be spilling out onto our one- lane North Service Road and our small, residential Frances Ave (part of the waterfront trail).

It saddens and surprises me that it is necessary to have to advocate for more insight on this matter. I would hope that the members of the Planning committee and members of Council would very thoughtfully consider what this proposal means - what incredible negative impact it would have - and act on our behalf. This is not simply a case of NIMBY. The scope of the proposal is beyond anything remotely reasonable, and I respectfully ask that limits to what builders request be considered even if it fits the zoning. This is not a "win-win" situation that we so often read about.

I also want to express how disappointed I am to have just learned about the Triple towers a few months ago from the front page of the Spectator, when apparently it has been on the radar for quite some time. I hope for more open communication in the future.

Thank you for your time.

Sincerely,
Linda McEneny

Sent: May 13, 2019 11:59 AM
To: clerk@hamilton.ca
Subject: 310 Frances Ave

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Thank you for your time.

Sincerely,
Linda McEneny

Sent: May 11, 2019 4:58 PM

To: clerk@hamilton.ca

Subject: Agenda Item 7.3 Planning Committee May 14th, 2019 Meeting

Referencing: Agenda Item 7.3 Planning Committee May 14th, 2019 Meeting

To Council, Planning Committee & Planning Staff,

Regarding the proposed development at 310 Frances Avenue, I, and what appears to be the community at large, continue to be extremely concerned about the massive triple tower development proposal in our small community. We are not being provided with any information. And we are not only seven (7) opposed to this development as was reported in the news. We are hundreds strong and growing every day as I had stated in my presentation of April 16th.

To reiterate the staggering amount of concerns made by the Design Review Panel at the April 11th meeting as well as the many well-researched points provided by our local delegation at the April 16th planning committee meeting, it is absolutely astonishing to many of us that this project has not been put on an extended pause until such time that more extensive, independent and unbiased studies are completed along with requests by council to the applicant for a major re-design and height reduction to fall in line and conform to the style of our existing community.

To be constantly told by council that a 'no height restriction' was put into place when the Shoreliner and Bayliner were proposed and built has no bearing on allowing a no-holds-barred development proposal. Clearly the original approved development proposal shows a smattering of like-buildings throughout this area. That is, similar to the two original existing buildings that rise eighteen stories. To drop in buildings that triple that height is unconscionable, particularly when it is simply designed to create a legacy for one (or maybe two).

The devastation that this massive building will surely cause to this extremely small community will be insurmountable in the immediate future if allowed to move forward in anything remotely close to the current design, height and mass. It is clear that the Design Review Panel had an issue with almost – if not every aspect of this design.

Noting the obvious points of concern:

1. Parking will be completely impossible. At any given time during the day and evening, Frances Avenue and Green Road are generally lined with vehicles from the current community. There simply are no additional parking spaces to be had even if every unit of the proposed 1836 had the required 1.5 parking spots on-site. To attempt to dump another 300 + vehicles onto these two streets is impossible.
2. Traffic congestion will be beyond extreme on Green Road, Frances Avenue, North Service Road and Church Street and will likely extend to all other side streets within the local community. It is without doubt that vehicles will be lined up for extensive periods of time attempting to enter and exit onto any one of these streets, particularly Green Road and Frances Avenue. Commute hours twice each day will only exacerbate an already impossible situation.
3. The safety of pedestrians, including the elderly and children, along with the joggers and cyclists that frequent this area are likely to experience insurmountable danger as

they attempt to navigate around the onslaught of additional traffic, especially the mass exodus onto Frances Avenue – the most popular route for pedestrian foot traffic.

4. Creating a massive concrete block will wreak havoc on any attempt at water percolation as more and more rain is dumped into our area. It is clear that the climate is trending in that direction. There will be nowhere for the water to travel and surely the current systems will be extremely taxed and potentially doomed to failure.

5. The likelihood of ground temperature rising must be put under serious scrutiny when air flow is interrupted. Minimal ground-level green space will make an impossible task of cooling the area and surrounding community. The lack of space to accommodate large-growth trees that provide natural, cooling shade will be detrimental. There will be nothing to control the extensive carbon footprint that will be created. Let it be noted that we just received a notice from local MP Bob Bratina that states the following in bold print –
BUDGET 2019: INVESTING IN THE ENVIRONMENT
FIGHTING CLIMATE CHANGE IN HAMILTON EAST-STONEY CREEK
Climate change is one of the most pressing issues of our time.

6. It is likely that Frances Avenue will become a ‘closed-in’ area between The Bayliner, the towers and the podium because of these massive buildings. It will surely cause a wind tunnel down the street that could make it nearly impossible to safely navigate the sidewalks through this area. This will pose serious issues for elderly people and children.

7. Should there be the need for emergency and fire vehicles, including first responders and police during periods of extreme congestion, remember - this current community has only one lane in and out of the entire area to reach the service road and the highway. Endless vehicles backed up just trying to come in or out of this area will thwart any efforts of medical or fire personnel to arrive safely and in a timely fashion. Moments count in an emergency and can become a matter of life or death! This should be of great concern to the aging population in our community.

In summary...

The sad and obvious fact is that this area simply cannot support such a massive development. One only need walk the area to know this to be true. Imagine the stress this places on the residents of this small community. There will surely be an enormous strain on everyone’s current lifestyle and daily routine – and all for the sake of creating a legacy. This is not a landmark build – this is a disaster to the land.

The nightly light pollution that will be created will surely affect and possibly destroy the local and migratory birds as they attempt to maintain their instinctive routes. It is a fact that millions are killed every year from collisions with buildings, especially those with extensive glass and lights.

The excessive traffic on Frances Avenue and Church Street will wreak havoc and cause potential destruction and devastation to the local turtle population and their annual travels to their limited nesting grounds which continue and will continue to shrink due to more and more development proposals in this area. This is of particular concern for the Snapping Turtles which are on the Ontario Endangered Species list.

When the UN advises that one million species of animals and plants are at risk for extinction from Human Activity – why would anyone want to be partner to that claim of such terrible proportion? Again – all for the sake of creating a legacy?

We implore you to reconsider this application for all of the reasons listed above and for this simple fact...

The original plan for this property at 310 Frances Avenue shows that there were to be two similar towers to the Shoreliner and Bayliner. This configuration allowed for a much more extensive green space that would accommodate these seven points of concern. One need simply observe the beautiful park-like setting with a multitude of mature trees and open expanses of lawn that surround these two original buildings (The Shoreliner and The Bayliner) to see how this area by the waterfront was designed to be in the overall scheme of this entire development. Why deviate from that original plan and ruin the true nature of the community.

Respectfully submitted,
Sherry Hayes
Shoreliner Resident



CITY OF HAMILTON
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Planning Division

TO:	Chair and Members Planning Committee
COMMITTEE DATE:	May 14, 2019
SUBJECT/REPORT NO:	Applications for an Amendment to the Rural Hamilton Official Plan and the City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13)
WARD(S) AFFECTED:	Ward 13
PREPARED BY:	Elyse Meneray (905) 546-2424 Ext. 6360
SUBMITTED BY:	Steve Robichaud Director, Planning and Chief Planner Planning and Economic Development Department
SIGNATURE:	

RECOMMENDATION

- (a) That **Amended Rural Hamilton Official Plan Amendment Application RHOPA-17-038 by 1685486 Ontario Inc. (Owner)**, to establish a Site Specific Policy to permit the expansion of a Cannabis Growing and Harvesting Facility having a maximum gross floor area of 9,505 sq m consisting of 6,305 sq m of growing and harvesting, 600 sq m of agricultural related uses and 2,600 sq m of accessory uses, for portions of the lands located at 1633 and 1649 Highway No. 6 North, Flamborough, as shown on Appendix “A” to Report PED19076, be **APPROVED** on the following basis:
- (i) That the draft Official Plan Amendment, attached as Appendix “B” to Report PED19076, be adopted by City Council;
 - (ii) That the proposed Official Plan Amendment is consistent with the Provincial Policy Statement (2014) and conforms to the Greenbelt Plan (2017);
 - (iii) That in the event that RHOPA 21 comes into force and effect prior to the adoption of the draft Official Plan Amendment, attached as Appendix “B” to

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OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

SUBJECT: Applications to Amend the Rural Hamilton Official Plan and City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13) - Page 2 of 37

Report PED19076, the definition of a Cannabis Growing and Harvesting Facility shall be removed.

- (b) That **Amended Zoning By-law Amendment Application ZAC-17-081 by 1685486 Ontario Inc. (Owner)**, for a modification to the Rural (A2) Zone to permit the expansion of a Cannabis Growing and Harvesting Facility having a maximum gross floor area of 9,505 sq m consisting of 6,305 sq m of growing, 600 sq m of agricultural related uses and 2,600 sq m of accessory uses, and a modification to the Conservation / Hazard Lands – Rural (P7) Zone to permit an office use in conjunction with the Cannabis Growing and Harvesting Facility and to prohibit a Cannabis Growing and Harvesting Facility, a Single Detached Dwelling, a Residential Care Facility, a Farm Labour Residence and an Agricultural Processing Establishment – Secondary within the existing building and prohibit expansions of the existing single detached dwelling, for portions of the lands located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough, as shown on Appendix “A” to Report PED19076, be **APPROVED** on the following basis:

- (i) That the draft By-law, attached as Appendix “C” to Report PED19076, which has been prepared in a form satisfactory to the City Solicitor, be enacted by City Council;
- (ii) That in the event that By-law 18-266 comes into effect prior to the passing of the draft By-law, attached as Appendix “C” to Report PED19076, the definition of the Cannabis Growing and Harvesting Facility shall be removed;
- (iii) That the amending By-law apply the Holding Provisions of Section 36(1) of the *Planning Act*, R.S.O. 1990 to the subject property by introducing the Holding symbol ‘H111’ to the proposed Rural (A2, 691) Zone.

The Holding Provision “H111” is to be removed to allow the development of the Cannabis Growing and Harvesting Facility, conditional upon:

- 1. The Owner submitting and receiving approval of an Odour Impact Assessment and Light Impact Assessment, to the satisfaction of the Director of Planning and Chief Planner.
- (iv) That the proposed change in zoning is consistent with the Provincial Policy Statement (2014), conforms to the Greenbelt Plan (2017), and will comply with the Rural Hamilton Official Plan upon approval of Official Plan Amendment No. ___.

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SUBJECT: Applications to Amend the Rural Hamilton Official Plan and City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13) - Page 3 of 37

EXECUTIVE SUMMARY

The Applicant has applied for an Amendment to the Rural Hamilton Official Plan (RHOP) and the City of Hamilton Zoning By-law No. 05-200 for lands located at 1633, 1649 and 1653 Highway No. 6 North to permit the expansion of the existing Cannabis Growing and Harvesting Facility.

The purpose of the RHOP Amendment application, as amended, is to expand the existing Cannabis Growing and Harvesting Facility to a maximum gross floor area of 9,505 sq. m, consisting of 6,305 sq m of growing, 600 sq m of agricultural related uses and 2,600 sq m of accessory uses and to define a Cannabis Growing and Harvesting Facility, on a portion of the lands, as shown on Appendix "A" to Report PED19076.

The purpose of the Zoning By-law Amendment application, as amended, is to rezone a portion of the subject lands to a modified Rural (A2) Zone and a modified Conservation / Hazard Land – Rural (P7) Zone to permit the expansion of the Cannabis Growing and Harvesting Facility to a maximum gross floor area of 9,505 sq m and to recognize an existing single detached dwelling. The site specific Rural (A2) Zone will include the following provisions:

- An expansion to the existing facility within a new greenhouse structure with a maximum gross floor area of 9,505 sq. m, containing 6,305 sq m of growing, 600 sq m for an Agricultural Processing Establishment – Secondary and 2,600 sq m of accessory uses (office, packaging, testing, storage, internal corridors and shipping and loading);
- A minimum setback of 125 m from the existing single detached dwelling (1653 Highway No. 6 North);
- A maximum lot coverage of 37% for all buildings and structures on portions of the subject lands;
- A maximum gross floor area of 600 sq m for the all buildings and areas devoted to an Agricultural Processing Establishment – Secondary;
- A minimum 1.4 m setback from the (P7) and (P8) Zone Boundary; and,
- Prohibit any expansions to the existing single detached dwelling located at 1653 Highway No. 6 North.

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The site specific Conservation / Hazard Land - Rural (P7) Zone will include the following provisions:

- Permit an accessory office use in conjunction with the Cannabis Growing and Harvesting Facility for the existing building located at 1633 Highway No. 6 North;
- Add the permitted uses of the Rural (A2) Zone for the existing building located at 1633 Highway No. 6 North;
- Prohibit a Cannabis Growing and Harvesting Facility a Single Detached Dwelling, a Residential Care Facility, a Farm Labour Residence and an Agricultural Processing Establishment – Secondary within the existing building located at 1633 Highway No. 6 North; and,
- Prohibit any expansions to the existing building (formerly the single detached dwelling) located at 1633 Highway No. 6 North.

The lands were subject to a recent RHOPA and Zoning By-law Amendment (CI-18-H) which changed medical marihuana to cannabis, required a 150 m separation distance from a sensitive land use and updated the requirements of a complete application to include an Odour Impact Assessment, Light Impact Assessment and Traffic Impact Study. The By-laws are currently under appeal. Since the applications predated the new regulations and it is unknown at the time of writing this report when the appeals will be resolved, additional amendments are required including a 125 m setback from a sensitive land use and to recognize the definition of a Cannabis Growing and Harvesting Facility.

A Holding Provision will also be applied to the subject lands until such time as the applicant has submitted and received approval of an Odour Impact Assessment and Light Impact Assessment.

In light of the appeal, the Applicant has submitted a request to revise their proposal from a Medical Marihuana Growing and Harvesting Facility to a Cannabis Growing and Harvesting Facility to reflect the changes adopted by Council. As the applications are now for a Cannabis Growing and Harvesting Facility, this term will be used throughout the report.

The applications as amended have merit and can be supported as they are consistent with the Provincial Policy Statement (2014) and conform to the Greenbelt Plan (2017). The proposal is considered to be compatible with existing and planned agricultural uses / development in the area and represents good planning by preserving the

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Protected Countryside for agricultural use while providing for diversified agricultural economic opportunities.

Alternatives for Consideration – See Page 36

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: N/A

Staffing: N/A

Legal: As required by the *Planning Act*, Council shall hold at least one public meeting to consider applications for an Official Plan Amendment and Zoning By-law Amendment.

HISTORICAL BACKGROUND

1.0 Former Use of Site

No. 1649 (previously 1647) Highway No. 6 North was previously used as an automotive salvage yard with PCB storage on site and is currently used as a solar generation site and a Cannabis Growing and Harvesting Facility. In March, 2008, a Provincial Officers Order was issued by the Ministry of Environment Conservation and Parks (MOECP) to remove waste materials, tires and demolition waste and was complied with in late 2008. On October 16, 2009 the MOCEP issued a decommissioning letter for the PCB storage and removed the site from the Provincial PCB inventory. Although, extensive remediation has occurred on site, the previous use of the property has degraded the soil and rendered it infertile.

The former salvage yard was owned by Bulk Steel and Salvage Limited and the associated warehouse and office building was constructed in 1979. In 2008, the warehouse and office building suffered fire damage and was rebuilt. A two storey addition to the existing warehouse and office building was added in 2014 and was converted to the growing and harvesting for medical marihuana.

No. 1633 Highway No. 6 North was a residential dwelling built in the 1940s and remains a residential use. Records indicate that the single detached dwelling at No. 1653 Highway No. 6 North was built prior to 1989 and was the original house associated with the salvage yard operation.

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2.0 Subject Lands

The subject lands are located on the west side of Highway No. 6 North, at the intersection of Highway No. 6 North and Concession 10 Road East, Flamborough, and are municipally known as 1633, 1649 and 1653 Highway No. 6 North (see Location Map attached as Appendix “A” to Report PED19076). Through Site Plan Control Application (DAR-17-182), the proposed Cannabis Growing and Harvesting Facility will be assigned the address of 1649 Highway No. 6 North. The subject lands are approximately 7.2 ha in size, however due to significant natural heritage constraints and existing structures on site the total developable area for the proposal is limited to 2.5 ha.

The site is bounded by Highway No. 6 North to the east with a Significant Woodland as a buffer, agricultural uses and Bronte Creek to the south, a kennel, agricultural uses and wetlands to the north and wetlands and woodlands to the west. Regional Tractor Sales and Servicing Limited is located adjacent to the property, across Highway No. 6 North.

The subject lands contain areas of the Beverly Swamp Significant Wetland Complex, the Strabane North Wetlands Environmentally Sensitive Area (ESA), Significant Woodlands and is traversed by a tributary of Grindstone Creek. Therefore, the entirety of the property is regulated by Conservation Halton.

1633, 1649 and 1653 Highway No. 6 North have become merged on title, and are currently in agricultural use by the owner, who is a federally licensed medical marijuana producer. Table 1 summarizes the existing uses for each address on the subject lands.

Table 1: Existing Uses on Site

Address	Use
1633 Highway No. 6 North	Existing 210 sq m single detached dwelling
1649 Highway No. 6 North	Existing 880 sq m Cannabis Growing and Harvesting Facility
	33 Standalone solar panels
1653 Highway No. 6 North	Existing 290 sq m single detached dwelling
	Existing access off of Highway No. 6 North to the single detached dwelling and facility

3.0 Proposed Development

The proposal is to permit an 8,625 sq m expansion to the existing 880 sq m facility for the growing and harvesting of cannabis. The new expansion will be attached to the existing Cannabis Growing and Harvesting Facility and contain a combined total of

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5,570 sq m of growing, 650 sq m of enclosed walkways which join the two buildings, 415 sq m devoted to the processing of cannabis oil and 2,160 sq m of accessory uses. The building area statistics for the existing Cannabis Growing and Harvesting Facility and the proposed Cannabis Growing and Harvesting Greenhouse can be found below in Tables 2 and 3.

Table 2: Building Area Statistics for the Existing Cannabis Growing and Harvesting Facility

Existing Cannabis Growing and Harvesting Facility		
Type of Use	Existing Use	Existing Size
Growing	Growing	555 m ²
Agriculture Related	Oil Production	185 m ²
Accessory	Office	140 m ²
TOTAL:		880 m ²

Table 3: Building Area Statistics for the Proposed Cannabis Growing and Harvesting Facility

Proposed Cannabis Growing and Harvesting Facility		
Type of Use	Proposed Use	Proposed Size
Growing	Growing	5,750 m ²
Agriculture Related	Oil Production (Agricultural Processing)	415 m ²
Accessory	Office (within the facility)	100 m ²
	Office (1633 Hwy 6)	210 m ²
	Packaging	200 m ²
	Testing (Agricultural Research)	200 m ²
	Storage	200 m ²
	Shipping and Loading	900 m ²
	Internal Corridors	650 m ²
TOTAL:		8,625 m ²

3.1 Original Applications and Staff Recommendations

The submitted RHOP Amendment and Zoning By-law Amendment applications proposed to continue the Salvage Yard operation use, the addition of a Private Power Generation Facility on the property, several accessory uses to the Cannabis Growing and Harvesting Facility and amendments to the RHOP and the Rural (A2) Zone regulations. Many of the requested uses and accessory uses are already permitted, including:

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- Agricultural Processing Establishment, Standalone;
- Agricultural Processing Establishment, Secondary;
- Service and office buildings accessory to cannabis growing and harvesting operations; and,
- Agricultural Research Operation.

Staff amended the applications by limiting the total lot coverage to 37% and permitting a total gross floor area of 9,505 sq m for the Cannabis Growing and Harvesting Facility. Table 4 provides a summary of the requested uses from the original applications and Table 5 provides a summary of the original requested amendments and additional amendments recommended by staff. These amendments will be discussed in greater detail in the Analysis and Rationale section of the Report.

Table 4: Proposed Uses Requested by the Applicant and Staff Recommendations

Proposed Uses Requested by the Applicant	Staff Recommendations
Salvage Yard	Not supportive of proposed use
Medical Clinic	Not supportive of proposed use
Education Establishment	Uses are not permitted in the Rural Hamilton Official Plan, but are recognized and permitted through an Agricultural Research Operation.
Biotechnical Establishment	
Science and Technology Establishment	
Research and Technology Establishment	
Laboratory	

Table 5: Proposed Amendments Requested by the Applicant and Staff Recommendations

Proposed Amendments Requested by the Applicant	Staff Recommendations
Permit a 10,000 sq m Cannabis Growing and Harvesting Facility	Permit a 9,505 sq m Cannabis Growing and Harvesting Facility, including accessory and agricultural processing – secondary uses.
Two dwellings on one lot	One dwelling on the property and one dwelling converted to an office
A 1.0 m setback for all buildings and structures to the boundary of a (P7)	A 1.4 m setback for all buildings and structures related to the Cannabis Growing and

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and (P8) Zone	Harvesting Facility to the boundary of a (P7) and (P8) Zone.
A minimum lot size of 7.2 ha	Approved through Committee of Adjustment application FL/A-18:291.
Additional Staff Recommendations	A minimum setback of 125 m from a sensitive land use.
	Maximum lot coverage of 37%.
	Maximum gross floor area of 600 sq m for an Agricultural Processing Establishment – Secondary (included in overall GFA of site).
	Prohibit the expansion of the existing single detached dwelling located at 1653 Highway No. 6 North.
	Permit an office use in conjunction with the Cannabis Growing and Harvesting Facility for the existing building located at 1633 Highway No. 6 North.
	Prohibit a Cannabis Growing and Harvesting Facility and a Dwelling Unit within the existing building located at 1633 Highway No. 6 North.

3.1 City Initiative CI-18-H to the Official Plans and Zoning By-law No. 05-200 relating to Cannabis Growing and Harvesting Facilities, Aquaponics and Greenhouses

In September, 2018, City Council adopted Urban Hamilton Official Plan Amendment 112 (By-law No. 18-264), Rural Hamilton Official Plan Amendment 21 (By-law No. 18-265) and Zoning By-law No. 18-266 to rename a Medical Marijuana Growing and Harvesting facility to a Cannabis Growing and Harvesting Facility, require the submission of odour, light, and traffic studies and establish a 150 m setback from a sensitive land use to a Cannabis Growing and Harvesting Facility. The amendments to the Rural Hamilton Official Plan and Zoning By-law No. 05-200 were appealed to the Local Planning Appeal Tribunal (LPAT), and accordingly, are not final and binding.

3.2 Site Plan Application

The Applicant has also submitted a Site Plan Control application (DAR-17-182) to construct one greenhouse with a gross floor area of 8,364 sq m. On April 23, 2018, Conservation Halton informed staff, that the Applicant had started constructing the facility without a building permit from the City of Hamilton or a fill permit from Conservation Halton. On April 25, 2018, the City of Hamilton issued a stop work order and Conservation Halton issued a Compliance Agreement. Through this process, the

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Applicant also submitted a Minor Variance application (FL/A-18:291) on November 15, 2018 to permit a minimum lot size of 7.2 hectares and a minimum 1.4 m setback from a (P7) and (P8) Zone for a greenhouse, which became final and binding on December 5, 2018.

3.3 Required Information

Staff, MTO and Conservation Halton reviewed the Official Plan Amendment, Zoning By-law Amendment and Site Plan Control applications and identified all the required materials needed for their review. The Site Plan Control application was reviewed simultaneously with the Official Plan Amendment and Zoning By-law Amendment applications as they contained the same information. Table 6 provides a summary of all the materials reviewed for the Official Plan Amendment, Zoning By-law Amendment and Site Plan Control applications and their status.

Table 6: Official Plan Amendment, Zoning By-law Amendment and Site Plan Control Application Materials

Department / Agency	Materials Requested	Status
MTO	Traffic Impact Study	Approved February 4, 2019 through the RHOPA and ZBA applications
	Drainage Report	
	Grading Plan	
	MTO Land Use Permit	Required through Site Plan; still outstanding
Conservation Halton and Natural Heritage	Environmental Impact Study	Approved through the RHOPA and ZBA applications, mitigation measures required through Site Plan
	Hydrogeological Study	Approved through the RHOPA and ZBA applications
	Grading and Drainage Plan	Approved through the RHOPA and ZBA applications; still outstanding for the Site Plan
	Erosion and Siltation Control Plan	Approved August 14, 2018 through Site Plan
	Stormwater Management Plan	Approved through the RHOPA and ZBA applications; still outstanding for the Site Plan
	Tree Protection Plan	Approved July 17, 2018 through the Site Plan
	Landscape Plan	Approved through the RHOPA and ZBA applications; still outstanding for the Site

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		Plan
Conservation Halton	Compliance Agreement	Approved July 24, 2018 through the Site Plan
Natural Heritage	Invasive Species Control Plan	Remains outstanding, will be implemented through the Landscape Plan
Source Water Protection	Hydrogeological Study	Approved through the RHOPA and ZBA applications; will be approved once Monitoring Agreement is finalized through the Site Plan
Development Engineering	Grading and Drainage Plan	Approved October 5, 2018 through the Site Plan
	Erosion and Siltation Control Plan	Approved August 8, 2018 through the Site Plan
	Stormwater Management Report	Approved October 5, 2018 through the Site Plan
Development Planning	Elevations	Approved June 3, 2018 through the Site Plan
	Site Lighting Design	Approved June 3, 2018 through the Site Plan
	Site Plan	Remains outstanding
	Archaeological Study	No longer required
	Planning Justification Report	Reviewed by staff for application
	Public Consultation Strategy	
	Survey	
	Odour and Dust Assessment	Required through RHOPA 21
	Light Impact Assessment	
Traffic Impact Study	Not required as site is located within the MTO regulated area	

The requirements for an Odour Impact Assessment and Light Impact Assessment will be discussed in greater detail in the Analysis and Rationale section of the Report.

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4.0 Chronology

- November 9, 2017: Rural Hamilton Official Plan Amendment RHOPA-17-038 and Zoning By-law Amendment ZAC-17-081 applications received.
- December 8, 2017: Rural Hamilton Official Plan Amendment RHOPA-17-038 and Zoning By-law Amendment ZAC-17-081 applications deemed incomplete.
- February 1, 2018: Rural Hamilton Official Plan Amendment RHOPA-17-038 and Zoning By-law Amendment ZAC-17-081 applications deemed complete.
- February 8, 2018: Notice of Complete Application and Preliminary Circulation sent to 29 property owners within 120 m of the subject lands.
- February 17, 2018: Public Notice sign installed on subject lands.
- April 17, 2019: Public Notice Sign updated with Public Meeting date.
- April 26, 2019: Notice of Public Meeting sent to 29 property owners within 120 m of the subject lands.

5.0 Details of Submitted Applications

- Agent:** Bennett Jones LLP (c/o Andrew Jeanrie)
- Owner / Applicant:** 1685486 Ontario Inc.
- Location:** 1633, 1649 and 1653 Highway No. 6 North
- Property Size:**
- | | |
|------------------|------------------------------|
| <u>Frontage:</u> | +/- 299.68 m |
| <u>Depth:</u> | +/- 137.45 m |
| <u>Area:</u> | +/- 71,629.36 sq m (7.16 ha) |
- Services:** Private Services

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6.0 EXISTING LAND USE AND ZONING

	<u>Existing Land Use</u>	<u>Existing Zoning</u>
<u>Subject Property:</u>	Agriculture (Cannabis Facility)	Rural (A2) Zone, Conservation / Hazard Land - Rural (P7) Zone and Conservation / Hazard Land – Rural (P8) Zone
<u>Surrounding Land Uses:</u>		
North	Agriculture	Rural (A2) Zone
South	Agriculture	Rural (A2) Zone, Conservation / Hazard Land – Rural (P7) Zone and Conservation / Hazard Land – Rural (P8) Zone
East	Agriculture, Tractor Dealership	Rural (A2) Zone and Existing Rural Commercial (E1) Zone
West	Vacant Land, Provincially Significant Woodlot and Provincially Significant Wetland	Conservation / Hazard Land – Rural (P7) Zone and Conservation / Hazard Land – Rural (P8) Zone

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

1.0 Greenbelt Plan (2017)

The subject lands are designated as “Protected Countryside” and they are within the “Natural Heritage” system. The following policies, among others, are applicable to the proposal.

“3.1.2.1 All types, sizes and intensities of *agricultural uses* and *normal farm practices* shall be promoted and protected and a full range of *agricultural uses*, *agricultural-related uses* and *on-farm diversified uses* are permitted based on the provincial Guidelines on Permitted Uses in Ontario’s Prime Agricultural Areas. Proposed *agriculture-related uses* and *on-farm diversified uses* shall be compatible with and shall not hinder surrounding agricultural operations.”

The growing and harvesting of cannabis is recognized as an agricultural use, which is permitted and promoted within the Greenbelt Plan. The processing of cannabis oil is

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considered to be a value-added agricultural product, diversifying the on-farm use of the subject lands. The processing into cannabis oil is conducted within a gross floor area of 600 sq m contained entirely within the proposed development and is secondary to the primary agricultural use. Therefore, the use is compatible with and will not hinder the surrounding agricultural and commercial uses.

- “3.2.2.1 The full range of existing and new agricultural, agriculture-related and on-farm diversified uses and normal farm practices are permitted subject to the policies of section 3.2.2.2.
- 3.2.2.2 New buildings or structures for agriculture, agriculture-related and on-farm, diversified uses are not subject to the policies of section 3.2.2.3, but are subject to the policies of section 3.2.5.
- 3.2.5 For lands within a key natural heritage feature or a key hydrologic feature in the Protected Countryside, the following policies shall apply:
4. In the case of wetlands, seepage areas and springs, fish habitat, permanent and intermittent streams, lakes and significant woodlands, the minimum vegetation protection zone shall be a minimum of 30 m measured from the outside boundary of the key natural heritage feature or key hydrologic feature.
 5. A proposal for new development or site alteration within 120 m of a key natural heritage feature within the Natural Heritage System or a key hydrologic feature anywhere within the Protected Countryside requires a natural heritage evaluation or a hydrological evaluation which identifies a vegetation protection zone which:
 - a) Is of sufficient width to protect the key natural heritage feature or key hydrologic feature and its functions from the impacts of the proposed change and associated activities that may occur before, during and after construction and, where possible, restore or enhance the feature and / or its functions; and,
 - b) Is established to achieve and be maintained as natural self-sustaining vegetation.”

The subject lands contain areas of the Beverly Swamp Significant Wetland Complex, the Strabane North Wetlands Environmentally Sensitive Area (ESA), Significant Woodlands and is traversed by a tributary of Grindstone Creek. An Environmental Impact Study was submitted with the applications recommending reduced vegetation

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protection zones to the Provincially Significant Wetland and Significant Woodlands. Conservation Halton and staff have reviewed the EIS and are supportive of the reduced vegetation protection zones for the Provincially Significant Wetland and Significant Woodlands. These matters will be discussed in greater detail in the Natural Heritage Policy Analysis section of the Report.

The proposal conforms with the policies of protecting the Natural Heritage System of the Protected Countryside, while introducing a greater on-farm diversity of agriculture and agriculture-related uses to the rural area of Hamilton.

The proposal conforms to the Greenbelt Plan (2017).

1.1 Provincial Policy Statement (2014)

The Provincial Planning Policy Framework is established through the *Planning Act* (Section 3) and the Provincial Policy Statement (PPS, 2014). The *Planning Act* requires that all municipal land use decisions affecting planning matters be consistent with the PPS.

“1.1.4.1 Healthy, integrated and viable *rural areas* should be supported by:

- (a) building upon rural character, and leveraging rural amenities and assets; and,
- (f) promoting diversification of the economic base and employment opportunities through goods and services, including value-added products and the sustainable management of resources.

1.1.5.4 Development that is compatible with the rural landscape and can be sustained by rural service levels should be promoted.

1.1.5.7 Opportunities to support a diversified rural economy should be promoted by protecting agricultural and other resource-related uses and directing non-related development to areas where it will minimize constraints on these uses.

1.1.5.8 Agricultural uses, agriculture-related uses, on-farm diversified uses and normal farm practices should be promoted and protected in accordance with provincial standards.”

As cannabis is considered a crop and an agricultural use and the proposal is for the growing and harvesting of cannabis within a greenhouse structure, the applications are consistent with the policies that promote and protect areas for agricultural use.

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These applications are consistent with the policies that focus on diversifying the activity of on-farm uses as processing cannabis into oils is a value-added agricultural product. These applications propose that the area for the processing of cannabis into cannabis oil will be 600 sq. m, and can be considered secondary, and related to the primary agricultural use of growing and harvesting cannabis. Secondary agricultural related processing uses are permitted as-of-right in the RHOP and Rural (A2) Zone in Zoning By-law No. 05-200, with a size limit of 500 sq. m.

“3.2.2 Sites with contaminants in land or water shall be assessed and remediated as necessary prior to any activity on the site associated with the proposed use such that there will be no *adverse effects*.”

Through the Ministry of Environment Conservation and Parks (MOECP), Ontario Regulation 153/04 requires property owners who want to change the use of a property to a new use that is more sensitive than the previous use, to file a Record of Site Condition on the Environmental Site Registry. The subject lands previously operated as a salvage yard under the former Town of Flamborough and were rezoned in 2015 as part of the Citywide Rural Rezoning.

Currently the site contains an existing 880 sq m Cannabis Growing and Harvesting Facility, 33 standalone solar panels and two single detached dwellings; the northern house is currently vacant and the southern house will be used as an office for the facility. As the applications will not be changing the use of the subject property and the cannabis facility is a permitted use in the Rural (A2) Zone, a Record of Site Condition is not required.

The proposal is consistent with the Provincial Policy Statement (2014).

2.0 Rural Hamilton Official Plan (RHOP)

These lands are designated as “Rural” on Schedule ‘D’ – Rural Land Use Designations of the RHOP. The following policies, among others, are applicable to the proposal.

“D.4.1 Uses permitted in the Rural designation are limited to the uses permitted in Section D.2.0, Agriculture Designation of this Plan, other resource – based rural uses and institutional uses serving the rural community.

D.2.1.1.4 Medical marihuana growing and harvesting facilities are permitted in accordance with the regulations set out in the Zoning By-law and provided that the following conditions are met:

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- a) a medical marihuana growing and harvesting facility is permitted in buildings existing at the date of the passing of the Zoning By-law;
- b) The gross floor area for a new medical marihuana growing and harvesting facility shall not exceed 2000 square metres;
- c) No retail sales are permitted;
- d) No outdoor storage is permitted; and,
- e) The establishment of a new medical marihuana growing and harvesting facility or the expansion of an existing facility shall be subject to Site Plan approval to address the appropriate building size and location, setbacks, drainage and any other matters.”

The RHOP limits the permitted uses in the Rural Designation to the permitted uses in the Agricultural Designation and other resource based rural uses and institutional uses serving the rural community. As such, the Rural Designation permits a cannabis growing and harvesting facility. Cannabis has been recognized as an agricultural product by staff and consider it appropriate to give consideration to a limited increase of the maximum gross floor area for cannabis growing and harvesting on portions of the subject lands. The increased gross floor area will be discussed in greater detail in the Analysis and Rationale section of the Report.

“D.2.1.2 *Agricultural-related uses* are farm-related commercial and farm-related industrial uses that are *small scale*, producing products and services, wholly and directly related to a farming operation and which are required in close proximity to an *agricultural use*. They are uses necessary to support *agricultural uses* and are permitted provided the following conditions are met:

- a) The use must produce products or services directly related to a *farming operation*, and requires a location in close proximity to a *farm operation*. Permitted uses shall be limited to grain dryers, feed mills, grain and seed storage facilities, primary farm produce bulk storage and agricultural processing facilities, farm product supply dealers, livestock assembly points, agricultural research operations, and veterinary services for farm animals;
- b) The use shall be located to minimize the amount of land removed from agricultural production; and,

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- d) The use shall not negatively affect environmental features in accordance with section C.2.0, Natural Heritage System of this Plan.”

As discussed in the Greenbelt Plan analysis, the processing into cannabis oil is considered an agricultural related use. The area for the processing of cannabis oil will be 600 sq m and will be integrated within the new and existing buildings and structures, minimizing the land removed from agricultural production.

The proposed 8,625 sq m structure is adjoined to the existing 880 sq m cannabis facility. The building or structure for growing and harvesting of cannabis is located closest to the public right of way at a distance of 100 m and surrounded by woodlands. The processing of cannabis into cannabis oil is permitted as an agricultural related use as described in the RHOP. The proposed development can therefore be supported by staff in that it is supportive of the character of the agricultural landscape in its limited size, in that it is consistent in use and is discretely located from the public right of way.

Natural Heritage

Based on mapping within Volume 1 of the RHOP (Schedule B Natural Heritage System), the majority of the property contains natural heritage features (Core Area, Greenbelt Protected Countryside and Greenbelt Natural Heritage System). Schedule B-2, B-4, B-6 and B-8 further classify these features as Provincially Significant Woodlands, Provincially Significant Wetlands, Key Hydrologic Feature – Stream and a Local Natural Area - Environmentally Significant Area. There are two Significant Woodlands surrounding the proposed development at the northeast portion of the subject lands, bordering Highway No. 6 North, and the southwest portion of the subject lands. There is a Provincially Significant Wetland, known as Beverly Swamp at the northwest of the subject lands and Schedule B-8 identifies a tributary of Grindstone Creek.

The following policies, among others, are applicable to the proposal.

Natural Heritage System – Core Areas

- “C.2.3.3 Any development or site alteration within or adjacent to Core Areas shall not negatively impact their environmental features or ecological functions.
- C.2.3.4 New development or site alteration shall not be permitted within provincially significant wetlands, significant coastal wetlands, or significant habitat of threatened or endangered species, except in accordance with applicable provincial and federal regulations with respect to significant habitat of threatened or endangered species.

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- C.2.4.2 New development or site alteration shall not be permitted within a key natural heritage feature within the Greenbelt Natural Heritage System or a key hydrologic feature anywhere in the Protected Countryside, including any associated vegetation protection zone. However, new development or site alteration proposed adjacent to (within 120 m of) a key natural heritage feature within the Greenbelt Natural Heritage System or a key hydrologic feature anywhere in the Protected Countryside requires an Environmental Impact Study which identifies a vegetation protection zone, according to the requirements in Sections C.2.4.10, C.2.4.11, C.2.4.12, C.2.4.13 and C.2.4.14.
- C.2.4.3 New buildings or structures for agriculture, agriculture-related and secondary uses are subject to policies in Sections C.2.4.1, C.2.4.2, C.2.4.10 and C.2.4.13.
- C.2.4.6 New development or site alteration subject to Sections C.2.4.1, C.2.4.2, C.2.4.3, C.2.4.5, C.2.4.7, C.2.4.8 and C.2.4.9 requires, prior to approval, the submission and acceptance of an Environmental Impact Statement, which demonstrates to the satisfaction of the City in consultation with the relevant Conservation Authority that:
- a) there shall be no negative impacts on the Core Areas of their ecological functions;
 - b) connectivity between Core Areas shall be maintained, or where possible, enhanced for the movement of surface and ground water, plants and wildlife across the landscape;
 - c) the removal of other natural features shall be avoided or minimized by the planning and design of the proposed use or site alteration wherever possible; and,
 - d) the disturbed area of a site shall not exceed 25 percent of the total developable area, except for golf courses, where permitted, for which the disturbed area shall not exceed 40 percent of the site. Impervious surfaces to be established in such disturbed areas shall not exceed 10 percent of the total developable area.
- C.2.4.9 New development and site alteration within the Protected Countryside of the Greenbelt Area that is proposed to take place within or adjacent to any other Core Area identified on Schedule B – Natural Heritage System, through a consent, Plan of Subdivision, Zoning By-law, Site Plan approval, Official Plan

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amendment or Site Alteration By-law permit shall require an Environmental Impact Statement in accordance with Sections C.2.4.6 of this Plan.

Vegetation Protection Zones

C.2.4.10 An Environmental Impact Statement shall also propose a vegetation protection zone which:

- a) Has sufficient width to protect the Core Area and its ecological functions from impacts of the proposed land use or site alteration occurring, during and after construction, and where possible, restores, or enhances the Core Area and/or its ecological functions; and,
- b) Is established to achieve, and be maintained as natural self-sustaining vegetation.

C.2.4.11 Where vegetation protection zones have not been specified by watershed and sub-watershed plans, Secondary or Rural Settlement Area Plan policies, Environmental Assessments and other studies, the following minimum vegetation protection zone width objective shall be evaluated and addressed by Environmental Impact Statements:

- a) Permanent and intermittent streams: 30 m vegetation protection zone on each side of the watercourse, measured from beyond the stable top of bank;
- b) Wetlands: 30-m vegetation protection zone. The Environmental Impact Statement shall also take into consideration adjacent upland habitat that is required by wetland species for breeding, foraging, dispersal, and other life processes; and,
- c) Significant Woodlands: a minimum 30-m vegetation protection zone measured from the drip line of trees at the woodlands edge;

C.2.4.13 Within the Protected Countryside of the Greenbelt Plan area, new development and site alteration adjacent to wetlands, seepage areas, springs, fish habitat, lakes, permanent and intermittent streams and significant woodlands shall maintain a minimum 30-m vegetation protection zone as measured from the outside boundary of the feature. Such a vegetation protection zone shall be established with natural, self-sustaining vegetation where the land within the vegetation protection zone is not used for agricultural purposes. New agricultural buildings and structures for

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agricultural uses are required to provide a 30-m vegetation protection zone from a key natural feature within the Greenbelt Natural Heritage System or a key hydrologic feature anywhere in the Protected Countryside but may not be required to establish a condition of natural self-sustaining vegetation, if the land is, and will continue to be, used for agricultural purposes.”

The subject lands contain areas of the Beverly Swamp Significant Wetland Complex, the Strabane North Wetlands Environmentally Sensitive Area (ESA), Significant Woodlands and is traversed by a tributary of Grindstone Creek. Together with Conservation Halton, the City of Hamilton undertook a refinement of the boundaries related to the unevaluated wetlands and the dripline of the Significant Woodlands. This work informed the Environmental Impact Study submitted with the applications, entitled Scoped Environmental Impact Study (November 2, 2017) and the Hydrogeological Study entitled Hydrogeological Study – 2017 Update (December 15, 2017).

Policy C.2.4.2 requires the submission of an environmental evaluation or hydrogeological evaluation for new development or site alteration within 120 m of a key natural heritage feature within the Natural Heritage System or key hydrologic feature anywhere within the Protected Countryside to identify a sufficient vegetation protection zone (VPZ). Furthermore, policy C.2.4.11b) c) requires a minimum VPZ of 30 m from a Provincially Significant Wetland (PSW) and Significant Woodlands, unless a reduced buffer can be adequately justified through an environmental evaluation. The western portion of the proposed development maintains a varying 20-30 m VPZ from the Provincially Significant Wetland and Significant Woodland, which staff support as the site has been significantly disturbed from previous and existing uses of the property and naturalized plantings are proposed within the VPZ to mitigate impacts from the proposed development. On the eastern portion of the proposed development, by the conifer plantation, the proposed VPZs range from 1.44 to 10 m wide as shown on Appendix “E” to Report PED19076. Conservation Halton and staff have reviewed the Scoped Environmental Impact Study and are supportive of the reduced VPZs for the Provincially Significant Wetland and Woodland for the following reasons:

- The site contains significant areas of disturbance from the previous and existing uses of the property;
- The proposed vegetation protection zones contain potentially contaminated fill and materials; Conservation Halton and staff have recommended that the VPZs not be widened to accommodate the larger VPZs, as the area should not be disturbed and is not capable of growing naturalized vegetation;
- The habitat surrounding the dripline of the woodlands does not contain any species at risk or sensitive natural features; and,

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- The following mitigation measures will be implemented through the Site Plan application to protect the sensitive natural features on site:
 - Bird Friendly Design to reduce bird collisions with the glass of the greenhouses;
 - Black-out curtains for all greenhouses, that will remain closed overnight to reduce light trespass;
 - Exterior lights to be pointed away from the natural areas, mounted at low heights and will be motion censored;
 - An Invasive Species Plan, which includes a monitoring and adaptive management plan to control invasive plants;
 - Silt fencing and bollards along the VPZs boundaries of the Provincially Significant Wetland and Provincially Significant Woodlot to protect the features and prevent the encroachment of materials, snow, fill and other debris from entering the areas; and,
 - 1 to 1 tree compensation for the 23 trees to be removed on site.

Therefore, the proposed development complies with the natural heritage policies of the RHOP.

Source Water Protection

C 5.0 Infrastructure

Private Water and Wastewater Services

- “C.5.1.1 No draft, conditional, or final approval of development proposals shall be granted by the City for any development in the rural area that could impact existing private services or involves proposed private services until the development proposal has complied with all of the following:
- a) Prior to or at the time of application for a proposal that could impact existing private services or involves proposed private services, development proponents shall submit complete information regarding existing or proposed private water and wastewater services. This information shall be complete to the satisfaction of the City. Where sufficient information is not available to enable a full assessment of on-site and off-site water supply and/or sewage disposal impacts or if the

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proponent does not agree with the City's calculations, the proponent shall be required to submit a hydrogeological study report completed in accordance with Section F.3.2.2 – Hydrogeological Studies of this Plan and Hydrogeological Study Guidelines as may be approved or amended from time to time.

- d) Development of a new land use or a new or replacement building on an existing lot that require(s) water and/or sewage servicing, may only be permitted where it has been determined by the requirements of Policies C.5.1.1 a) and b) that the soils and size of the lot size are sufficient to accommodate the water system and sewage disposal system within acceptable levels of on-site or off-site impacts including nitrate impact, and shall include sufficient land for a reserve discharge site or leaching bed. The maximum lot size shall be in accordance with F.1.14.2.1 g).
- e) The private water supply and sewage disposal systems shall be capable of sustaining the proposed and existing uses within acceptable levels of on-site and off-site water quantity and quality impacts, including nitrate impact.”

A Hydrogeological Study was required as part of the Rural Hamilton Official Plan and Zoning By-law Amendment applications. The Hydrogeological Study evaluated the water quantity, water quality and impact assessment of wastewater for the site. A monitoring and reporting agreement is required as part of the Site Plan Control application. Additionally, Conservation Halton has reviewed the submitted Hydrogeological Study and are supportive of the evaluation because the development and site alteration will have no adverse effects on the hydrologically sensitive feature or the related hydrological function for the feature. The monitoring and reporting agreement will be discussed in greater detail in the Analysis and Rationale section of this report.

2.1 Rural Hamilton Official Plan Amendment 21 (CI-18-H)

The purpose of Official Plan Amendment 21 to the Rural Hamilton Official Plan was to amend the definition and associated regulations for a cannabis growing and harvesting facility to incorporate non-medical cannabis (recreational marijuana) production facilities. Several changes were proposed to the Rural Hamilton Official Plan including:

- Deleting the definition of a Medical Marijuana Growing and Harvesting Facility and replacing it with the following new definition:

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Cannabis Growing and Harvesting Facility: shall mean a wholly enclosed building or structure used for growing, harvesting, testing, destroying, packaging and shipping of cannabis, for a facility where a licence, permit or authorization has been issued under applicable federal law.

- Incorporating the testing, packaging, and shipping of cannabis as accessory uses to the cannabis growing and harvesting facility;
- Establishing an appropriate setback between a Cannabis Growing and Harvesting Facility and a sensitive land use through the Zoning By-law; and,
- Updating the submission requirements of a Complete Application and Formal Consultation as part of official plan amendment, zoning by-law amendment and site plan applications by adding an Odour and Dust Impact Study and Light Impact Assessment Study.

RHOPA 21 was appealed to the LPAT and is currently not final and binding.

3.0 City of Hamilton Zoning By-law No. 05-200

The subject lands contain three separate zones. The majority of the property is zoned Conservation/Hazard Land – Rural (P7) Zone on the eastern and western portion of the site and Conservation/Hazard Land – Rural (P8) Zone on the western and northern portion of the site, whereas the interior of the site and north east corner is zoned Rural (A2) Zone. The proposal will modify the Rural (A2) Zone and Conservation / Hazard Land – Rural (P7) Zone; there are no modifications to the Conservation / Hazard Land – Rural (P8) Zone.

3.1 Rural (A2) Zone

The Rural (A2) Zone permits, among other things:

- A maximum lot coverage of 20% for all agricultural buildings and structures;
- A total gross floor area of 2,000 sq m for a cannabis growing and harvesting facility;
- No outdoor storage;
- No retail sales;
- A single detached dwelling on a lot; and,

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- Agricultural Processing Establishment - Secondary to agriculture and limited to 500 sq m.

The subject property contains two single detached dwellings, which as a result of the merger on title became a single lot containing two single detached dwellings as legal non-conforming. The Rural (A2) Zone permits one single detached dwelling for a residential use and accessory uses for the Cannabis Growing and Harvesting Facility. The single detached dwelling located at 1633 Highway No. 6 North will remain and be used as an office in conjunction with the facility. The single detached dwelling located at 1653 Highway No. 6 North will remain as a residential use.

An amendment is required to modify the subject lands to a site specific Rural (A2) Zone to permit the proposed use for a 9,505 sq m Cannabis Growing and Harvesting Facility. The specific provisions will permit:

- An expansion to the existing facility within a new greenhouse structure with a maximum gross floor area of 9,505 sq. m, containing 6,305 sq m of growing, 600 sq m of agricultural related uses and 2,600 sq m of accessory uses;
- A minimum setback of 125 m from the existing sensitive land use located at 1653 Highway No. 6 North;
- A maximum lot coverage of 37% for all buildings and structures on portions of the subject lands;
- A maximum gross floor area of 600 sq m for all buildings and areas devoted to an Agricultural Processing Establishment – Secondary; and,
- A minimum 1.4 m setback from the P7 and P8 Zone Boundary.

The specific provisions will prohibit:

- Any expansions to the existing single detached dwelling located at 1653 Highway No. 6 North.

3.2 Conservation / Hazard Land – Rural (P7) Zone and Conservation / Hazard Land – Rural (P8) Zone

The Conservation / Hazard Land – Rural (P7) and Conservation / Hazard Land – Rural (P8) Zones permit agriculture, conservation, existing single detached dwelling, flood and erosion control facilities and passive recreation. The Zones do not permit the development of new buildings or structures.

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An amendment is required to modify the subject lands to a site specific Conservation / Hazard Land – Rural (P7) Zone to:

- Permit an accessory office use in conjunction with the Cannabis Growing and Harvesting Facility for the existing building located at 1633 Highway No. 6 North;
- Add the permitted uses of the Rural (A2) Zone for the existing building located at 1633 Highway No. 6 North;
- Prohibit a Cannabis Growing and Harvesting Facility a Single Detached Dwelling, a Residential Care Facility, a Farm Labour Residence and an Agricultural Processing Establishment – Secondary within the existing building located at 1633 Highway No. 6 North; and,
- Prohibit any expansions to the existing building (formerly the single detached dwelling) located at 1633 Highway No. 6 North

The proposed zoning modifications are discussed in greater detail in the Zone Chart included in Appendix “D” to Report PED19076 and the Analysis and Rationale Section of the Report.

3.3 Zoning By-law No. 18-266 (CI-18-H)

The purpose of Zoning By-law No. 18-266 was to amend the definition and associated regulations for a medical marihuana growing and harvesting facility in Zoning By-law No. 05-200 for the Agriculture (A1) Zone and Rural (A2) Zone to incorporate non-medical cannabis (medical marihuana) production facilities. The changes to Zoning By-law No. 05-200 include:

- Deleting the definition of a Medical Marihuana Growing and Harvesting Facility and replacing it with the following new definition:

Cannabis Growing and Harvesting Facility: shall mean a wholly enclosed building or structure used for growing, harvesting, testing, destroying, packaging and shipping of cannabis, for a facility where a licence, permit or authorization has been issued under applicable federal law.

- Updating the Agricultural Processing Establishment – Stand Alone definition to include cannabis products as agricultural processing;
- Requiring a 150 m setback from the Cannabis Production Facility to an existing sensitive land use or to a specific zone boundary;

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- Increase the setback from any lot line from 20 m to 30 m in the A1 (Agricultural) and A2 (Rural) Zones; and,
- Incorporating the testing, packaging, and shipping of cannabis as accessory uses to the cannabis growing and harvesting facility.

RELEVANT CONSULTATION

The following Internal Departments and Agencies had no comments or objections to the applications:

- Forestry and Horticulture, Public Works Department.

The following Departments and Agencies submitted the following comments:

Transportation Planning (Planning and Economic Development) has advised that the Ministry of Transportation needs to comment on the application as the subject lands are located within their regulated limits and is to be completed through the Site Plan.

Healthy Environments Division staff have advised that any existing well on the property must be properly decommissioned according to Regulation 903 under the *Ontario Water Resources Act* to protect the local aquifer, which is overseen by the Ministry of Environment, Conservation and Parks (MOECP). Additionally, the Healthy Environments Division advises that if a septic tank exists on the property that is decommissioned in the future, then the septic tank should be emptied by an MOECP licensed sewage hauler and then filled with soil to reduce the likelihood of a future safety hazard.

Corporate Assets and Strategic Planning Division (Public Works Department) have noted that the subject lands are eligible for waste collection services which will be further reviewed at the Site Plan Control Stage.

The Ministry of Environment Parks and Conservation (MOECP) provides instruction related to stormwater management and rainwater reserve systems, including greenhouses. They indicate the necessity to seek permits if water taking is to exceed 50,000 L/day. These matters are being addressed through the Site Plan application.

Conservation Halton have reviewed the Environmental Impact Study, Hydrological Study, Stormwater Management Report, Landscape Plan, Wetland Impact Assessment, Grading and Drainage Plan and Erosion and Siltation Control Plan. Conservation Halton has advised that the reviewed reports are satisfactory for the Official Plan Amendment

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and Zoning By-law Amendment Stage, but revisions and mitigation measures will be required at the Site Plan Control Stage.

The Ministry of Transportation (MTO) advised that the following be resolved before approving the Rural Official Plan Amendment and Zoning By-law Amendments:

- Close the existing access and align the new access with Concession 10 East;
- Upgrade the proposed access to MTO standards;
- Upgrade the existing access to the house at 1633 Highway No. 6 North to MTO standards;
- Close the southern access to the house at 1633 Highway No. 6 North;
- Submit and receive approval of a Traffic Impact Study;
- Submit and receive approval of a Stormwater Management Report;
- Obtain a Ministry entrance permit for the solar panels on site;
- Obtain a Building and Land Use permit for the proposed development; and,
- Provide clarification from the City of Hamilton as to why there are two houses and three addresses on one lot of record.

At the time of writing this report, all MTO comments have been addressed with regards to the Rural Hamilton Official Plan and Zoning By-law Amendment Applications. All outstanding concerns, including obtaining a Building and Land Use permit for the proposed development, will be addressed at the Site Plan Control Stage.

PUBLIC CONSULTATION

In accordance with the provisions of the *Planning Act* and the Council Approved Public Participation Policy, a Notice of Complete Application and Preliminary Circulation was circulated to 24 property owners within 120 m of the subject lands on November 28, 2017. A Public Notice sign was posted on the subject lands on December 19, 2017 and updated on April 17, 2019 with the Public Meeting date. Finally, Notice of the Public Meeting was circulated to 24 property owners on April 26, 2019 in accordance with the requirements of the *Planning Act*. To date, no comments or concerns have been received by staff from the public regarding the proposal.

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Public Consultation Strategy

The Applicant submitted a Public Consultation Strategy which noted that the owner has been working with the City of Hamilton to educate all residents interested in ongoing development of the cannabis industry in general and the agricultural nature of the proposal and the proposal facility in particular. The owner canvassed the residences within 120 m of the subject lands and provided information regarding the proposal. The owner also met with the Ward Councillor to determine whether a Neighbourhood Information Meeting would be required, and if so, an implementation and follow-up strategy that would be taken. At a March 2018 meeting, it was determined that a Neighbourhood Information Meeting would not be required.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

1. The proposed Rural Hamilton Official Plan Amendment and Zoning By-law Amendment, as amended by staff, have merit and can be supported for the following reasons:
 - (i) It is an adaptive reuse of a former salvage yard and is a more appropriate use for the site as traditional agricultural practices would not be sustainable on the property;
 - (ii) They comply with the general intent of the RHOP in that they preserve Rural Designated lands for agricultural use, while protecting natural heritage features;
 - (iii) The proposed development maintains the subject lands in agricultural use within a greenhouse, and includes small scale processing, which is representative of value-added agricultural products and on-farm diversification; and,
 - (iv) They are consistent with the Provincial Policy Statement (2014) and conform to the Greenbelt Plan (2017).
2. The subject lands are located on the west side of Highway No. 6 North, at the intersection of Highway No. 6 North and Concession 10 Road East, Flamborough. The property currently contains two single detached dwellings located at 1633 and 1653 Highway No. 6 North and an existing 880 sq m Cannabis Growing and Harvesting Facility located at 1649 Highway No. 6 North. The applications purpose to permit the expansion of a Cannabis Growing and Harvesting Facility having a maximum gross floor area of 9,505 sq m consisting

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of 6,305 sq m of growing and harvesting, 600 sq m of agricultural related uses and 2,600 sq m of accessory uses.

Official Plan Amendment

In accordance with the policies of the RHOP, a Cannabis Growing and Harvesting Facility is limited to a maximum gross floor area of 2,000 sq. m. The proposal is for a 9,505 sq m Cannabis Growing and Harvesting Facility. On this basis, an amendment to the RHOP is required in order to permit the proposed Cannabis Growing and Harvesting Facility.

The property was previously used as an automotive salvage yard with PCB storage on site. The previous use has left the soil derelict and contaminated, preventing traditional agricultural practices on the property. Further, the site is severely constrained by natural features and existing structures, limiting the total developable area to 2.5 hectares. The proposal is for a Cannabis Growing and Harvesting Facility which is a permitted use in the Rural Designation. Staff are supportive of the RHOP amendment as it is an adaptive reuse of a former salvage yard, there are no other options for development on the site due to significant constraints and it preserves the property for agricultural and agricultural related uses.

Zoning By-law Amendment

The subject property is currently zoned Rural (A2) Zone, Conservation / Hazard Land – Rural (P7) Zone and Conservation / Hazard Land – Rural (P8) Zone in the City of Hamilton Zoning By-law No. 05-200.

An amendment is required to modify the subject lands to a site specific Rural (A2) Zone to permit the proposed use for a 9,505 sq m Cannabis Growing and Harvesting Facility. The specific provisions will permit:

- An expansion to the existing facility within a new greenhouse structure with a maximum gross floor area of 9,505 sq. m, containing 6,305 sq m of growing, 600 sq m of agricultural related uses and 2,600 sq m of accessory uses;
- A minimum setback of 125 m from the existing sensitive land use located at 1653 Highway No. 6 North;
- A maximum lot coverage of 37% for all buildings and structures on portions of the subject lands;

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- A maximum gross floor area of 600 sq m for all buildings and areas devoted to an Agricultural Processing Establishment – Secondary; and,
- A minimum 1.4 m setback from the (P7) and (P8) Zone Boundary.

The specific provisions will prohibit:

- Any expansions to the existing single detached dwelling located at 1653 Highway No. 6 North.

An amendment is also required to modify the subject lands to a site specific Conservation / Hazard Land – Rural (P7) Zone to:

- Permit an accessory office use in conjunction with the Cannabis Growing and Harvesting Facility for the existing building located at 1633 Highway No. 6 North;
- Add the permitted uses of the Rural (A2) Zone for the existing building located at 1633 Highway No. 6 North;
- Prohibit a Cannabis Growing and Harvesting Facility a Single Detached Dwelling, a Residential Care Facility, a Farm Labour Residence and an Agricultural Processing Establishment – Secondary within the existing building located at 1633 Highway No. 6 North; and,
- Prohibit any expansions to the existing buildings (formerly the single detached dwelling) located at 1633 Highway No. 6 North

The proposed expansion of the existing Cannabis Growing and Harvesting Facility can be supported as it is an adaptive reuse of a former salvage yard, promotes agricultural uses on property where traditional agricultural practices are not sustainable and supports on farm diversification through small scale processing. Further, the proposal will preserve Rural Designated lands for agriculture and complies with the intent of the RHOP. Therefore, staff support the Zoning By-law Amendment.

Staff's analysis and recommendation of the requested modifications are provided below and within Appendix "D" to Report PED19076.

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SUBJECT: Applications to Amend the Rural Hamilton Official Plan and City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13) - Page 32 of 37

(i) Setback to a Sensitive Land Use

RHOPA 21 and By-law No. 18-266 (CI-18-H) included a 150 m setback requirement from a Cannabis Production Facility to an existing sensitive land use or to a specific zone boundary. The Applicant has requested a reduction to the 150 m setback to 125 m from the proposed Cannabis Growing and Harvesting Facility to recognize the existing single detached dwelling located at 1653 Highway No. 6 North. Staff are supportive of the reduced setback for the following reasons:

- The Applicant initiated the Planning process in November 2017, by way of these applications (RHOPA-17-038 and ZAC-17-081), which predates the Council adoption of the changes to the Official Plans and Zoning By-law No. 05-200 relating to Cannabis Growing and Harvesting Facilities, Aquaponics and Greenhouses;
- The existing Cannabis Growing and Harvesting Facility is setback back 128.8 m from the existing single detached dwelling located at 1653 Highway No. 6 North and 136.1 m from the proposed facility. Staff recognize this as an existing situation, dating back prior to 1989 and acknowledge that the existing single detached dwelling would not be able to be severed from the property, leaving no other options for the house;
- The amending Zoning By-law will prohibit the expansion of the existing single detached dwelling located at 1653 Highway No. 6 North. This will discourage further non-compliance with the 150 m setback from a sensitive land use regulation;
- The proposed facility is setback 114.0 m from the existing southern single detached dwelling located at 1633 Highway No. 6 North; however it will be utilized as an office use in conjunction with the Cannabis Growing and Harvesting Facility. Therefore this building will cease to be a sensitive land use;
- The amending Zoning By-law will prohibit a Cannabis Growing and Harvesting Facility and Dwelling Unit within the existing building located at 1633 Highway No. 6 North to ensure that a sensitive land use will not be located within 150 m of the facility and that the existing building will not be used for the growing and harvesting of cannabis, as it would be located closer than 150 m to the adjacent single detached dwelling located at 1625 Highway No. 6 North;

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- The amending By-law will prohibit the expansion of the existing building located at 1633 Highway No. 6 North and the development of any new buildings;
- The proposed Cannabis Growing and Harvesting Facility is setback 150.4 m from an existing single detached dwelling located on adjacent lot at 1625 Highway No. 6 North and 174.5 m from the adjacent single detached dwelling located at 1659 Highway No. 6 North, maintaining the 150 m setback from a sensitive land use;
- The site is severely constrained by both existing structures and natural heritage features on site, limiting the total developable area to a small portion of property within the interior of the site. For the facility to function efficiently, the proposed development will be attached the existing facility that was built in 1979 and has functioned as a Medical Marihuana Growing and Harvesting Facility since 2014; and,
- The table lands are the most appropriate location for the development based on the vegetation protection zones established through the Environmental Impact Statement and for compliance to the 150 m setback. If the proposal were moved from its current state, it runs the risk of encroaching further into the Provincially Significant Wetland and Significant Woodlands and closer to the existing single detached dwelling located at 1625 Highway No. 6 North.

(ii) Development Constraints

The property contains areas of the Beverly Swamp Significant Wetland Complex, the Strabane North Wetlands Environmentally Sensitive Area (ESA), Significant Woodlands, is traversed by a tributary of Grindstone Creek, two single detached dwellings, an existing 880 sq m Cannabis Growing and Harvesting Facility and 33 standalone solar panels. The site is surrounded by Provincially Significant Wetlands to the west and north of the proposal and Significant Woodlands to the east. The south of the site contains 33 standalone solar panels, which further restricts the developable area of the site. The subject property is approximately 7.2 hectares in size, however due to the significant natural heritage constraints and existing structures on site; the total developable area for the proposal is limited to 2.5 hectares, which is considerably smaller than the majority of agricultural properties in the City of Hamilton. Given that the site has numerous constraints, staff are supportive of the expansion and increase in lot coverage, as there is no other options for development on the site.

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4. RHOPA 21 updated the requirements of a complete application to include the submission of an Odour Impact Assessment and Light Impact Assessment. Although, the applicant initiated the Planning process in November 2017, by way of these applications (RHOPA-17-038 and ZAC-17-081), which predates the Council adoption of the changes to the Official Plans and Zoning By-law No. 05-200 relating to Cannabis Growing and Harvesting Facilities, Aquaponics and Greenhouses staff are requiring the submission of an Odour Impact Assessment and Light Impact Assessment.

The Odour Impact Assessment and the Light Impact Assessment will determine the amount of nuisance to the surrounding areas and staff will use the information to determine the necessary mitigation measures for the site. These requirements will be implemented by adding a Holding Provision to the amending Zoning By-law, as shown on Appendix “C” to Report PED19076.

5. The subject lands were included in the new City Initiated CI-18-H changes to the Official Plans and Zoning By-law No. 05-200 relating to Cannabis Growing and Harvesting Facilities, Aquaponics and Greenhouses, which was passed on September 12, 2018 by Council (By-law No.18-264 and By-law No. 18-266). The amendments to the Rural Hamilton Official Plan and Zoning By-law No. 05-200 were appealed to the Local Planning Appeal Tribunal (LPAT). A Case Management Conference is scheduled for May 2, 2019. The amendment was appealed in its entirety and therefore the following regulations are not in force and effect:

- The new definition of a Cannabis Growing and Harvesting Facility;
- The recognition of the new term cannabis as opposed to medical marihuana;
- The requirement of a 150 m setback from a sensitive land use; and,
- The submission requirements of an Odour and Dust Impact Assessment and Light Impact Assessment.

As the Official Plan and Zoning By-law are currently under appeal, the new definition of a Cannabis Growing and Harvesting Facility was included in the Official Plan Amendment and Zoning By-law Amendment of this Report (Appendix “B” and Appendix “C”). If the new definition comes into force and effect, between the completion of the report and these applications being considered by Planning Committee and Council the definition of a Cannabis Growing and Harvesting Facility should be removed prior to the adoption of the Official Plan Amendment and the passage of the Zoning By-law Amendment.

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SUBJECT: Applications to Amend the Rural Hamilton Official Plan and City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13) - Page 35 of 37

This recommendation was added to both the Official Plan and Zoning By-law Amendment applications to address this matter.

6. Through the review of the Hydrogeological Study it was determined that a monitoring and reporting agreement was required. The monitoring and reporting agreement will be dealt with through the Site Plan Control Application and include the following requirements:
- Daily estimates of the pumped water volume from the supply well at 1653 Hwy 6 as well as daily calculations of total water use to better determine effectiveness of water recycling rates. Water use should be calculated on a daily basis and calibration records of water meters shall be regularly provided;
 - Metered wastewater flows for both process wastewater and domestic sewage and provision of records and volumes of process water treated/hailed by external third party. Design of the industrial wastewater holding tank shall be provided to ensure potential overflows can be appropriately managed;
 - Continuous (one-hour frequency) groundwater level monitoring at the residential well at 1633 Hwy 6, with quarterly datalogger downloads;
 - Continuous (one-hour frequency) groundwater level measurements for all monitoring wells and, quarterly manual measurements for wetland drivepoint piezometers;
 - Annual spring water quality sampling of raw groundwater at 1653 Hwy 6 for historical parameters of concern – heavy metals, pH, DO, EC, turbidity, temperature, plus all nitrogen species, e. coli, total coliforms; and,
 - Biannual (spring/fall) water quality sampling of monitoring well(s) at downgradient property boundary – general chemistry, heavy metals, all nitrogen species, all phosphorus species.

The Applicant will be required to monitor and provide annual reports on the quality and quantity of water and wastewater to the City of Hamilton for a period of five years. As part of the agreement, staff reserves the right to modify, request additional information and extend the monitoring and reporting agreement past the required five years, if warranted. Staff are satisfied that the monitoring and reporting agreement has addressed all water and wastewater concerns on site.

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7. A Landscape Plan, Tree Protection Plan and Habitat Restoration Plan were submitted with the Applications. Staff have advised that the plans are satisfactory for the purposes of the Official Plan Amendment and Zoning By-law Amendment applications; however, a revised Landscape Plan will be required at the Site Plan Control Stage.
8. As part of the Application submission, the Applicant submitted a Stormwater Management Report, Grading and Drainage Plan and Erosion and Siltation Control Plan. Development Engineering staff have advised that the all submitted information is satisfactory for the purposes of the Official Plan Amendment and Zoning By-law Amendment Applications, and have been approved through Site Plan Control Application DAR-17-182.

ALTERNATIVES FOR CONSIDERATION

Should the applications be denied, the subject lands would remain as the current Rural (A2) Zone and Conservation/Hazard Land – Rural (P7) and (P8) Zones in the City of Hamilton Zoning By-law 05-200, which permits, among other things:

- Maximum lot coverage of 20%;
- A maximum gross floor area for all new buildings and structures devoted to a Cannabis Growing and Harvesting Facility of 2,000 sq m;
- A single detached dwelling on a lot;
- Agricultural Research Operation secondary to agriculture; and,
- Agricultural Processing Establishment - Secondary to agriculture and limited to 500 sq m.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement & Participation

Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Economic Prosperity and Growth

Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

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SUBJECT: Applications to Amend the Rural Hamilton Official Plan and City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough (PED19076) (Ward 13) - Page 37 of 37

Healthy and Safe Communities

Hamilton is a safe and supportive city where people are active, healthy, and have a high quality of life.

Clean and Green

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Built Environment and Infrastructure

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

Culture and Diversity

Hamilton is a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.

Our People and Performance

Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" – Location Map

Appendix "B" – Draft Official Plan Amendment

Appendix "C" – Zoning By-law No. 05-200 Amendment Rural (A2) Zone

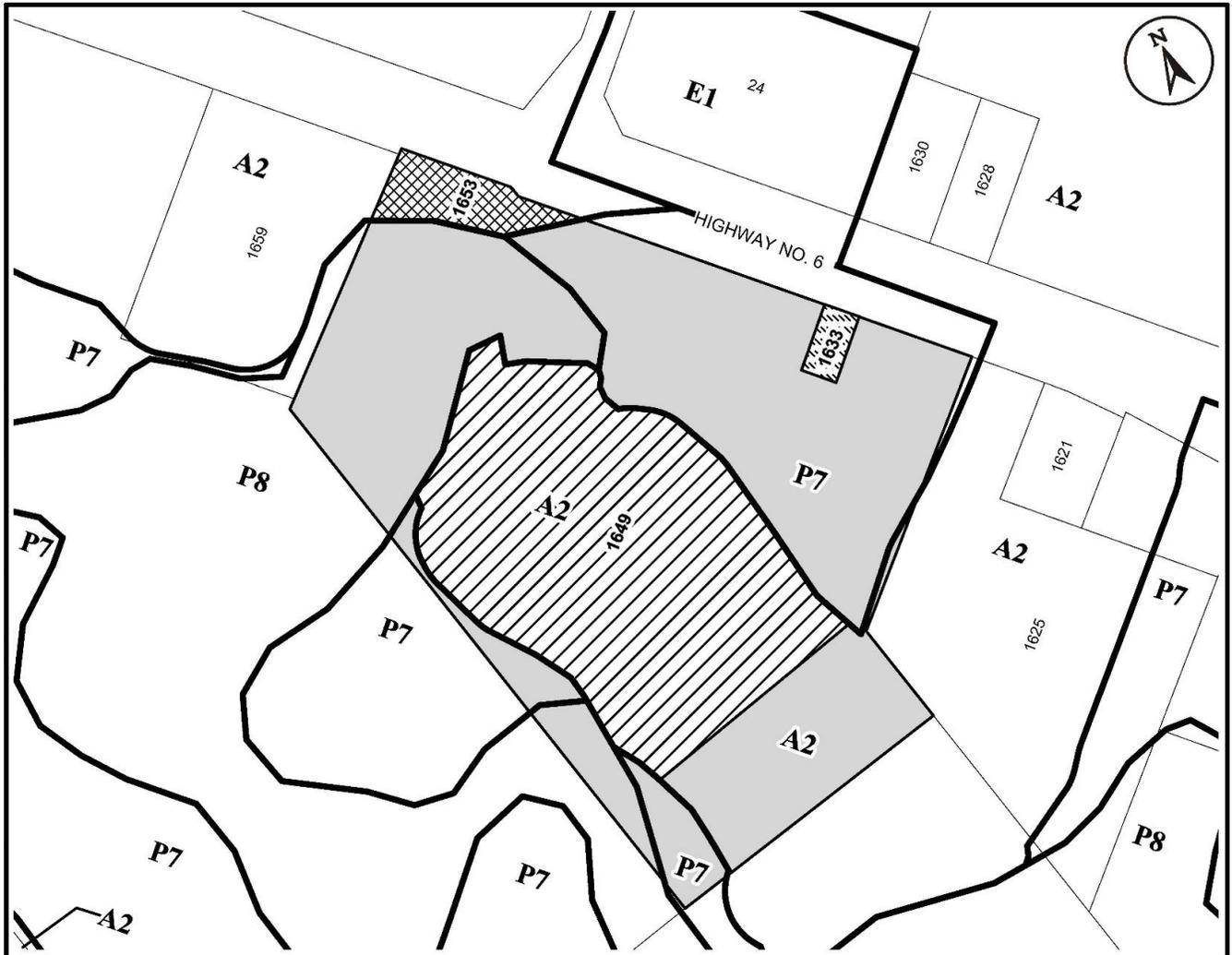
Appendix "D" – Zoning Modification Chart

Appendix "E" – Proposed Site Plan

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● Site Location

Location Map



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT

File Name/Number:
Amended ZAC-17-081

Date:
April 15, 2019

Appendix "A"

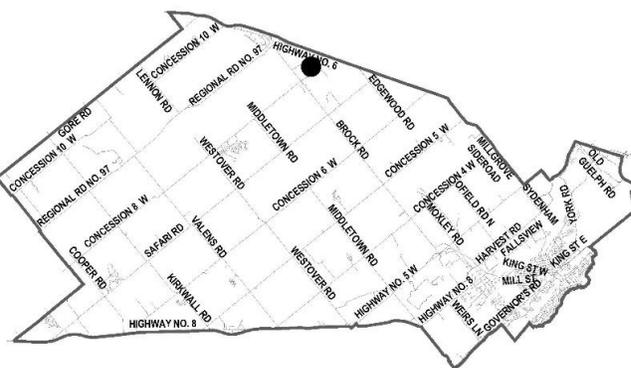
Scale:
N.T.S.

Planner/Technician:
EM/NB

Subject Property

1633, 1649 & 1653 Highway 6 North

-  **Block 1** - Modification in Zoning from Rural (A2) Zone to Rural (A2, 691, H111) Zone
-  **Block 2** - Modification in Zoning from Conservation/Hazard Land - Rural (P7) Zone to Conservation/Hazard - Rural (P7, 691) Zone
-  **Block 3** - Modification in Zoning from Rural (A2) Zone to Rural (A2, 691) Zone
-  Other Land Owned by Applicant



Key Map - Ward 13

N.T.S.



DRAFT Rural Hamilton Official Plan Amendment No. X

The following text, together with Appendix "A" – Volume 3: Appendix A – Site Specific Key Map, attached hereto, constitutes Official Plan Amendment No. XX to the Rural Hamilton Official Plan.

1.0 Purpose:

The purpose and effect of this Amendment is to establish a Rural Site Specific Area to permit expansions to the existing *Cannabis Growing and Harvesting Facility*, to permit the processing of cannabis into cannabis oil as an *agricultural-related use*.

2.0 Location:

The lands affected by this Amendment are known municipally as 1633 and 1649 Highway No. 6 North, in the former Town of Flamborough.

3.0 Basis:

The basis for permitting this Amendment is:

- The proposed Amendment recognizes innovative on-farm diversification, through the expansion of an existing *agricultural use* and the introduction of an *agricultural-related use*;
- The proposed Amendment is compatible with the existing and planned *agricultural uses* in the immediate area as an adaptive re-use of a former salvage yard; and,
- The proposed Amendment is consistent with the Provincial Policy Statement, 2014, and conforms to the Growth Plan for the Greater Golden Horseshoe, 2017.

4.0 Actual Changes:

4.1 Volume 3 – Special Policy and Site Specific Areas

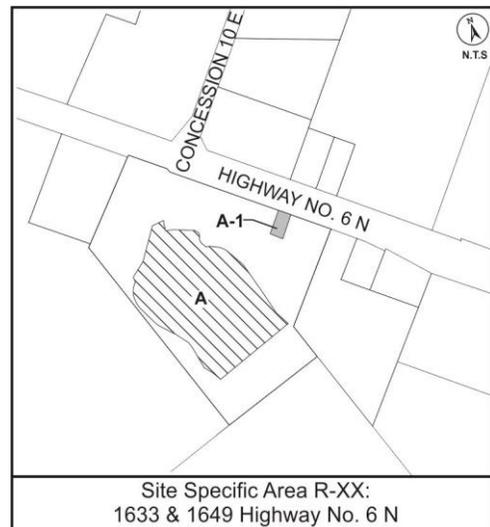
Text

4.1.1 Chapter B – Rural Site Specific Areas

- a. That Volume 3: Chapter B – Rural Site Specific Areas be amended by adding a new Site Specific Area – R-XX as follows:

“R-XX – Lands known municipally as 1633 and 1649 Highway No. 6 North, former Town of Flamborough.

- 1.0 For the lands known municipally as 1633 and 1649 Highway No. 6 North, designated Rural on Schedule “D” – Rural Land Use Designations and identified as Areas A and A-1 in Site Specific Area R-XX, a *cannabis growing and harvesting facility* shall be permitted, subject to the following policies:



- a) Notwithstanding Policy D.2.1.1.4. b) of Volume 1, the maximum gross floor area for a *cannabis growing and harvesting facility* shall not exceed 9,505 square metres.
- b) That the definition of *Medical Marijuana Growing and Harvesting* be replaced with the following new definition:

“Cannabis Growing and Harvesting Facility: shall mean a wholly enclosed building or structure used for growing, harvesting, testing, destroying, packaging and shipping of cannabis, for a facility where a licence, permit or authorization has been issued under applicable federal law.”

- 1.1 For the lands known municipally as 1633 Highway No. 6 North, designated Rural on Schedule “D” – Rural Land Use Designations and identified as Area A-1 in Site Specific Area R-XX, the following additional policies shall apply:

- a) in addition to the uses permitted in Section D.4 – Rural, an office associated with the *cannabis growing and harvesting facility* located in Area A shall be permitted within the building existing at the date of the passing of this By-law; and,
- b) the Zoning By-law shall identify the range of permitted and prohibited uses for the site.

Schedules and Appendices

4.1.2 Volume 3: Appendix A – Site Specific Key Map

- a. That Volume 3: Appendix A – Site Specific Key Map be amended by identifying the subject lands as Site Specific Area R-XX, as shown on Appendix "A" attached to this Amendment.

5.0 Implementation:

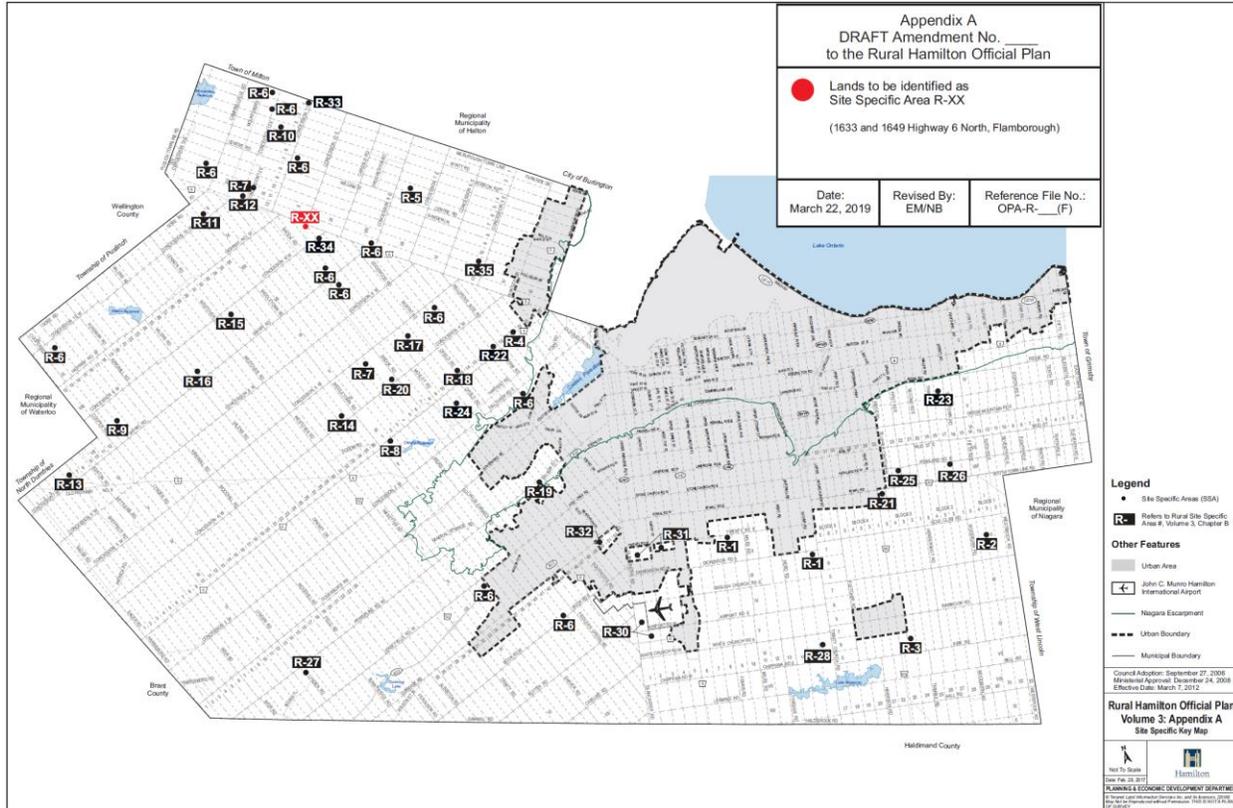
An implementing Zoning By-Law Amendment and Site Plan Control Application will give effect to the intended uses on the subject lands.

This Official Plan Amendment is Schedule "1" to By-law No. _____ passed on the _____ of _____, 2019.

The City of Hamilton

F. Eisenberger
MAYOR

J. Pilon
ACTING CITY CLERK



Authority:
Ward: 13
Bill No.

CITY OF HAMILTON
BY-LAW NO.

**To Amend Zoning By-law 05-200 Respecting Lands Located at
1633, 1649, 1653 Highway No. 6 North, Flamborough**

WHEREAS Council approved Item ___ of Report PED19076 of the Planning Committee, at its meeting held on May 14, 2019;

WHEREAS this By-law will be in conformity with the Rural Hamilton Official Plan upon approval of Official Plan No. XX.

NOW THEREFORE the Council of the City of Hamilton enacts as follows:

1. That Map No. RU25 and RU26 of Schedule "A" – Zoning Maps of Zoning By-law No. 05-200 be amended as follows:
 - a) by modifying the zoning from the Rural (A2) Zone to the Rural (A2, 691, H111) Zone, to the extent and boundaries of which are shown on Schedule "A" annexed hereto and forming part of this By-law; and,
 - b) by modifying the zoning from the Conservation / Hazard Lands – Rural (P7) Zone to the Conservation / Hazard Lands – Rural (P7, 691) Zone, to the extent and boundaries of which are shown on Schedule "A" annexed hereto and forming part of this By-law.
2. That Schedule "C" – Special Exceptions, of By-law No. 05-200 is amended by adding a special exception as follows:

691. Within those lands zoned Rural (A2) Zone, identified on Maps RU25 and RU26, of Schedule "A" – Zoning Maps and described as:

Property address	Map number
1633, 1649 and 1653 Highway No. 6 North, Flamborough	RU25 and RU26

- a) The following special provisions shall apply to 1649 and 1633 Highway No. 6 North:
 - i) Notwithstanding Section 3 Definitions, for the purposes of Special Exception 691 the following definition shall apply:

To Amend Zoning By-law 05-200 Respecting Lands Located at
1633, 1649 and 1653 Highway No. 6 North, Flamborough

Cannabis Growing and Harvesting Facility: shall mean a wholly enclosed building or structure used for growing, harvesting, testing, destroying, packaging and shipping of cannabis, for a facility where a licence, permit or authorization has been issued under applicable federal law.

- ii) Notwithstanding Subsection 12.2.3.1 m) i) and 12.2.3.2 d) i), the maximum gross floor area for all buildings and structures devoted to the Cannabis Growing and Harvesting Facility shall not exceed 9,505 square metres and shall be comprised of:

1.	Growing and Harvesting of Cannabis	A maximum gross floor area of 6,305 square metres
2.	Agricultural Processing - Secondary	A maximum gross floor area of 600 square metres
3.	Accessory Uses (office, testing, packaging, storage, internal corridors and shipping and loading)	A maximum gross floor area of 2,600 square metres

- iii) Notwithstanding Section 12.2.3.1 e), the maximum lot coverage for all buildings and structures, devoted to a Cannabis Growing and Harvesting Facility shall not exceed 37% of the combined lot area.
- b) The following special provisions shall apply to 1649 Highway No. 6 North:
- i) Notwithstanding Subsection 12.2.3.1 m) iv) 2., and Subsection 4.12 d) any building or structure used for a Cannabis Growing and Harvesting Facility shall be setback a minimum of 125 metres from the existing single detached dwelling located at 1653 Highway No. 6 North.
- ii) Notwithstanding Subsection 4.23 d) iii), the Cannabis Growing and Harvesting Facility shall be setback a minimum of 1.4 metres from the P7 and P8 Zone Boundary.
- c) The following special provisions shall apply to 1633 Highway No. 6 North:
- i) In addition to Subsection 7.7.1, an office use in conjunction with the Cannabis Growing and Harvesting Facility and the uses identified in Subsections 12.2.1 and 12.2.3.2 a) shall be permitted within the building existing at the date of the passing of the by-law (date)

To Amend Zoning By-law 05-200 Respecting Lands Located at
1633, 1649 and 1653 Highway No. 6 North, Flamborough

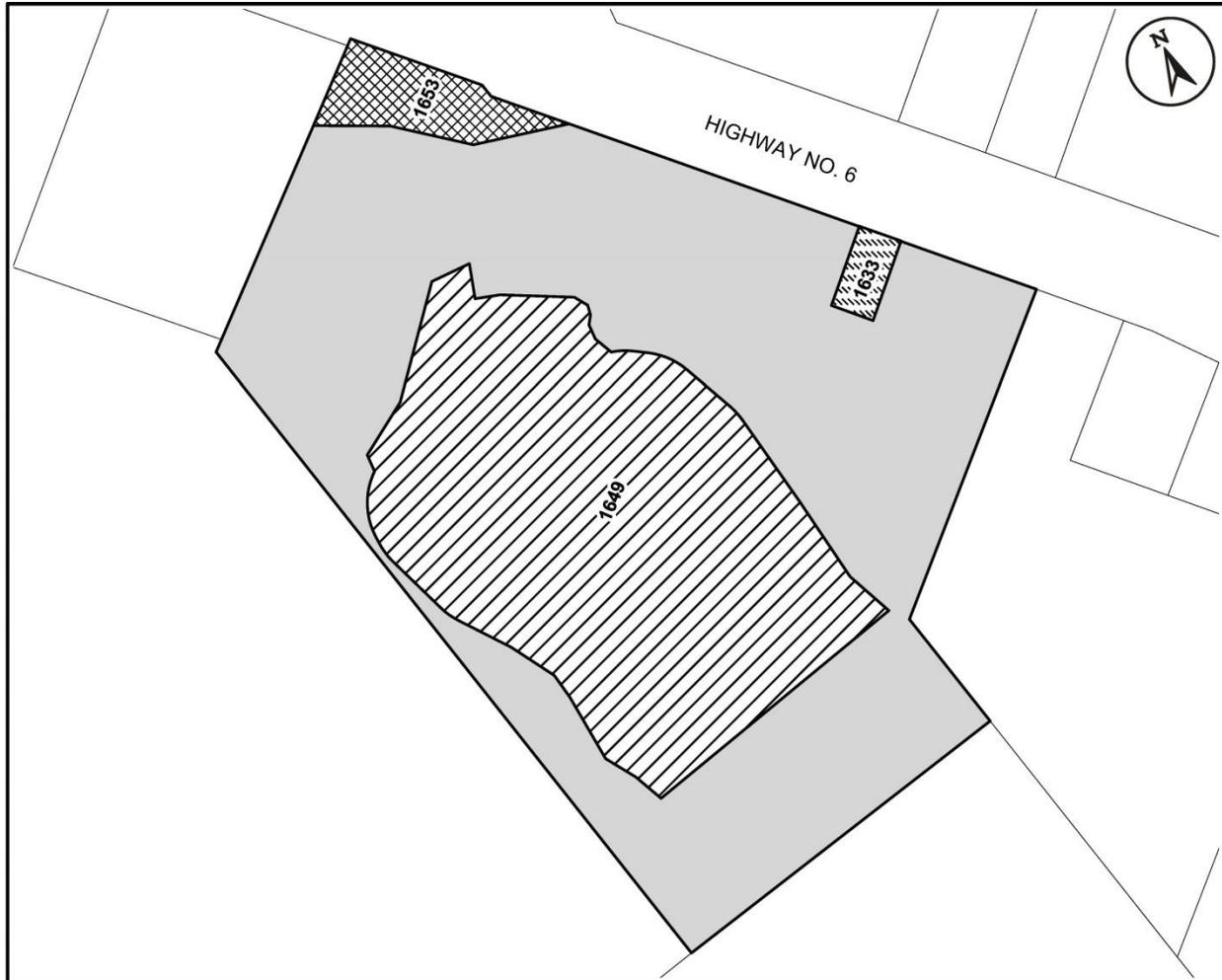
- ii) Notwithstanding Clause i) the following uses shall be prohibited:
 - 1. Cannabis Growing and Harvesting Facility;
 - 2. Single Detached Dwelling;
 - 3. Residential Care Facility;
 - 4. Farm Labour Residence; and,
 - 5. Agricultural Processing Establishment – Secondary.
 - iii) Notwithstanding Subsection 7.7.2.1 b), no expansions to the existing building shall be permitted.
- d) The following special provisions shall apply to 1653 Highway No. 6 North:
- i) No expansions to the existing single detached dwelling shall be permitted.
3. That Schedule "D" – Holding Provisions, of By-law No. 05-200, be amended by adding the additional Holding Provision as follows:
- "111. Notwithstanding Section 12.2 and within lands zoned Rural (A2 ,691) Zone of this By-law, identified on Maps RU25 and RU26 on Schedule "A" – Zoning Maps, and described as 1649 Highway No. 6 North, a Cannabis Growing and Harvesting Facility shall not be permitted until such time as:
- i) An Odour Impact Assessment and Light Impact Assessment has been submitted and approved, to the satisfaction of the Director of Planning and Chief Planner.
4. That the Clerk is hereby authorized and directed to proceed with the giving of notice of the passing of this By-law, in accordance with the *Planning Act*.
5. That this By-law No. XXX shall come into force and deemed to come into force in accordance with Subsection 34(21) of the *Planning Act*, either upon the date of passage of the By-law or as otherwise provided by the said subsection.

PASSED this X day of May, 2019.

Fred Eisenberger
Mayor

Janet Pilon
Acting City Clerk

To Amend Zoning By-law 05-200 Respecting Lands Located at
1633, 1649 and 1653 Highway No. 6 North, Flamborough



This is Schedule "A" to By-law No. 19-
Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-200
Maps RU25 & RU26

Subject Property
1633, 1649 & 1653 Highway 6 North

 **Block 1** - Modification in Zoning from Rural (A2) Zone to Rural (A2, 691, H111) Zone

 **Block 2** - Modification in Zoning from Conservation/Hazard Land - Rural (P7) Zone to Conservation/Hazard Zone - Rural (P7, 691) Zone

 **Block 3** - Modification in Zoning from Rural (A2) Zone to Rural (A2, 691) Zone

 Other Land Owned by Applicant

Scale: N.T.S.	File Name/Number: Amended ZAC-17-081	 Hamilton
Date: April 15, 2019	Planner/Technician: EM/AL	
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT		

To Amend Zoning By-law 05-200 Respecting Lands Located at
1633, 1649 and 1653 Highway No. 6 North, Flamborough

Is this by-law derived from the approval of a Committee Report? Yes

Committee: Chair and Members Report No.: PED19076 Date: 04/16/2019

Ward(s) or City Wide: Ward: 13 (MM/DD/YYYY)

Prepared by: Elyse Meneray

Phone No: 6360

For Office Use Only, this doesn't appear in the by-law

Site Specific Modifications to the Rural (A2) Zone

Regulation	Required	Modification	Analysis
Maximum Gross Floor Area for a Cannabis Growing and Harvesting Facility	2,000 sq m per building	<p>Maximum gross floor area of 9,505 sq. m</p> <p><u>Existing Facility</u> Office: 140 m² Growing: 555 m² Oil Production: 185 m² TOTAL: 880 m²</p> <p><u>Proposed Facility</u> Growing: 5,750 m² Oil Production: 415 m² Accessory Uses: 2,460 m² TOTAL: 8,625 m²</p> <p>Note: The maximum gross floor area of 9,505 sq m is a combined total of the existing facility and proposed facility.</p>	<p>The intent of the Rural (A2) Zone is to promote and preserve agricultural lands for predominately agricultural uses, while allowing for secondary agricultural and agricultural related uses. The proposed modification is to increase the maximum gross floor area for a Cannabis Growing and Harvesting facility to 9,505 sq m.</p> <p>The proposal is to permit an 8,625 sq m expansion to the existing 880 sq m facility for the growing and harvesting of cannabis. The new expansion will be attached to the existing Cannabis Growing and Harvesting Facility and contain a combined total of 5,570 sq m of growing, 650 sq m of enclosed walkways which join the two buildings, 415 sq m devoted to the processing of cannabis oil and 2,160 sq m of accessory uses.</p> <p>As the expansion will bring the use closer to the size of other agricultural operations within the City of Hamilton, as the use is permitted and it will be not be consuming prime agricultural land, staff are supportive of the amendment.</p>

Site Specific Modifications to the Rural (A2) Zone

Regulation	Required	Modification	Analysis
Medical Marihuana Growing and Harvesting Facility Definition	N/A	Recognize the definition of a Cannabis Growing and Harvesting Facility	<p>The lands were subject to a recent RHOPA and Zoning By-law Amendment (CI-18-H) which deleted the definition of a Medical Marihuana Growing and Harvesting Facility and replaced it with a new definition for a Cannabis Growing and Harvesting Facility. The By-laws are currently under appeal. Since the applications predated the new regulations and it is unknown at the time of writing this report when the appeals will be resolved, an amendment is required to recognize the definition of a Cannabis Growing and Harvesting Facility.</p> <p>Staff are supportive of the modification as the new definition will reflect the changes adopted by Council.</p>
Maximum Lot Coverage	20%	37%	<p>The intent of this provision is to limit the total lot coverage on agricultural lands to minimize the amount of land being removed from agricultural production. The subject lands are a former salvage yard and have significant natural heritage constraints, limiting the total developable area of the site to 2.5 hectares. Since the quality of the soil has been significantly degraded due to previous uses of the property, and would not be suitable for growing crops staff feel that allowing the increase in lot coverage would not be removing viable agricultural lands suitable for growing crops out of production and therefore support the modification.</p>

Site Specific Modifications to the Rural (A2) Zone

Regulation	Required	Modification	Analysis
Maximum Gross Floor Area for Agricultural Processing Establishment – Secondary	500 sq m	600 sq m	<p>The intent of this provision is to limit the size of agricultural processing to ensure that it is secondary to the main agricultural use. The proposed modification will increase the allowable agricultural processing on site by 100 sq m for a total of 600 sq m.</p> <p>The proposed development will have a total gross floor area of 9,505 sq m, with 8,695 sq m (94%) for the cannabis growing and harvesting and 600 sq m (6%) for processing of cannabis. As the processing is clearly secondary to the main agricultural use, staff are supportive of the modification.</p>
Special Setback from a Conservation/Hazard Land (P5) Zone, Conservation/Hazard Land - Rural (P7) Zone and Conservation/Hazard Land - Rural (P8) Zone	7.5 m	1.4 m	<p>This modification was previously approved by the Committee of Adjustment through application FL/A-18:291, however the variance was written specifically to use of a greenhouse and not the use of a Cannabis Growing and Harvesting Facility. This modification was included to carry forward previous approvals.</p>
Single Detached Dwelling	N/A	Expansions to the existing buildings and structures located at 1653 Highway No. 6 North shall be prohibited.	<p>The intent of this modification is to prohibit any new buildings or structures, or the alteration or expansion of the existing buildings and structures located at 1653 Highway No. 6 North to discourage further non-compliance with the 150 m setback from a sensitive land use regulation. Preventing any new buildings or modifications to the existing building will ensure that the existing building will not encroach further into the 150 m setback, as such staff are supportive of the modification.</p>

Site Specific Modifications to the Rural (A2) Zone – Under Appeal

Regulation	Required	Modification	Analysis
Minimum Setback from a Cannabis Growing and Harvesting Facility to any residential dwelling unit existing at the date of the passing of the by-law	150 m	125 m	The proposed modification is required to recognize the location of the existing single detached dwelling (1653 Highway No. 6 North). The single detached dwelling located at 1653 Highway No. 6 North, is the original house associated with the salvage yard and was built prior to 1989. The existing Cannabis Growing and Harvesting Facility is setback 128.8 m from the existing single detached dwelling and the proposed Cannabis Growing and Harvesting Facility is setback 136.1 m from the existing single detached dwelling. Staff recognize this as an existing situation, dating back prior to 1989 when the house was built within 128.8 m of the office building used for the salvage yard operation and acknowledge that the existing single detached dwelling would not be able to be severed from the property. Therefore, staff are supportive of the modification.

Regulation	Required	Modification	Analysis
Permitted uses	N/A	Permit an office use within the single detached dwelling and grant the use permissions of the Rural (A2) Zone, but prohibit a Cannabis Growing and Harvesting Facility, a Single Detached Dwelling, a Residential Care Facility, a Farm Labour Residence and Agricultural Processing Establishment – Secondary.	<p>The proposed modification is required to permit an office use in conjunction with the proposed Cannabis Growing and Harvesting Facility within the existing building located at 1633 Highway No. 6 North. Accessory uses are permitted for the Cannabis Growing and Harvesting Facility, therefore staff are supportive of the modification.</p> <p>In addition to permitting the office use, the modification will prohibit a Cannabis Growing and Harvesting Facility, a Single Detached Dwelling, a Residential Care Facility, a Farm Labour Residence and Agricultural Processing Establishment – Secondary within the existing building located at 1633 Highway No. 6 North. This modification is required to ensure that a sensitive land use will not be located within 150 m of the facility and that the existing building will not be used for the growing, harvesting and processing of cannabis, as it would be located closer than 150 m to the adjacent single detached dwelling located at 1625 Highway No. 6 North.</p>
Single Detached Dwelling (future office)	N/A	Expansions to the existing building and structure located at 1633 Highway No. 6 North shall be prohibited.	The intent of this modification is to prohibit any expansions or alterations of the existing buildings and structures located at 1633 Highway No. 6 North. The modification will also prohibit a Cannabis Growing and Harvesting Facility and Dwelling Unit within the existing building located at 1633 Highway No. 6 North to ensure that a sensitive land use will not be located within 150 metres of the facility and that the existing building will not be used for the growing and harvesting of cannabis.

DRAWING LEGEND

- PROPERTY LINE
- SURFACE COVER (EXISTING)
- SURFACE COVER (PROPOSED)
- WELL HEAD / LIGHT POLE
- CHAIN SURV. POLE (EXISTING)
- WELL SERVICE (EXISTING)
- PROPOSEDLY SIGNIFICANT WETLAND
- 30m WETLAND SETBACK
- 15m WETLAND SETBACK
- P6 ZONE
- P7 ZONE
- EA / SIGNIFICANT WOODLAND BOUNDARY
- AREAS TO BE NATURALIZED (SEE LANDSCAPE PLAN (DETAL 0.10M))
- SNOW STORAGE
- WELL SERVICE
- WELL SERVICE
- EDGE OF GRAVEL
- EXIST. & PROP. ELEVATION
- CONTOURS
- OVERLAND DRAINAGE ARROW



GENERAL NOTES

- PROPERTY LINES ARE METRIC. DIMENSIONS ARE IN METERS.
- ANY DISCREPANCIES BETWEEN INFORMATION ON THIS SITE DRAWING AND ACTUAL FIELD CONDITIONS, WHEN THEY IMPACT ON THE PROPOSED DEVELOPMENT, ARE TO BE REFERRED TO THE SENIOR CONSULTANT (P) ETC.
- ANY LANDSCAPED OR GRASSED AREAS WITHIN THE AREA OF PROPOSED DEVELOPMENT WHICH ARE DAMAGED OR IMPACTED DURING THE COURSE OF CONSTRUCTION OR SITE DEVELOPMENT, ARE TO BE PROPERLY REPAIRED AND PROPERLY SEEDED. UNDEVELOPED AREAS WHERE TREES HAVE BEEN REMOVED ARE TO BE RE-PLANTED AND RE-SOILED.
- EXACT LOCATIONS & BEARINGS OF ALL EXISTING SERVICES (SANITARY SEWERS, WATER, GAS, WELL ETC.) SHOWN. MATERIALS, LEVELS, ELEVATIONS, DIMENTS, ETC. TO BE REFERRED BY CONTRACTOR FROM TO COMPLETION OF ANY SITE WORK.
- ANY FILL PLACED ON THIS MUST BE COMPACTED TO A MIN. 90% STANDARD PROCTOR DENSITY.
- ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE CITY OF HAMILTON PROCEDURES AND SPECIFICATIONS. ALL FENCES AND SIGNS SHALL COMPLY WITH APPROPRIATE BY-LAWS.

CITY OF HAMILTON - SITE PLAN NOTES

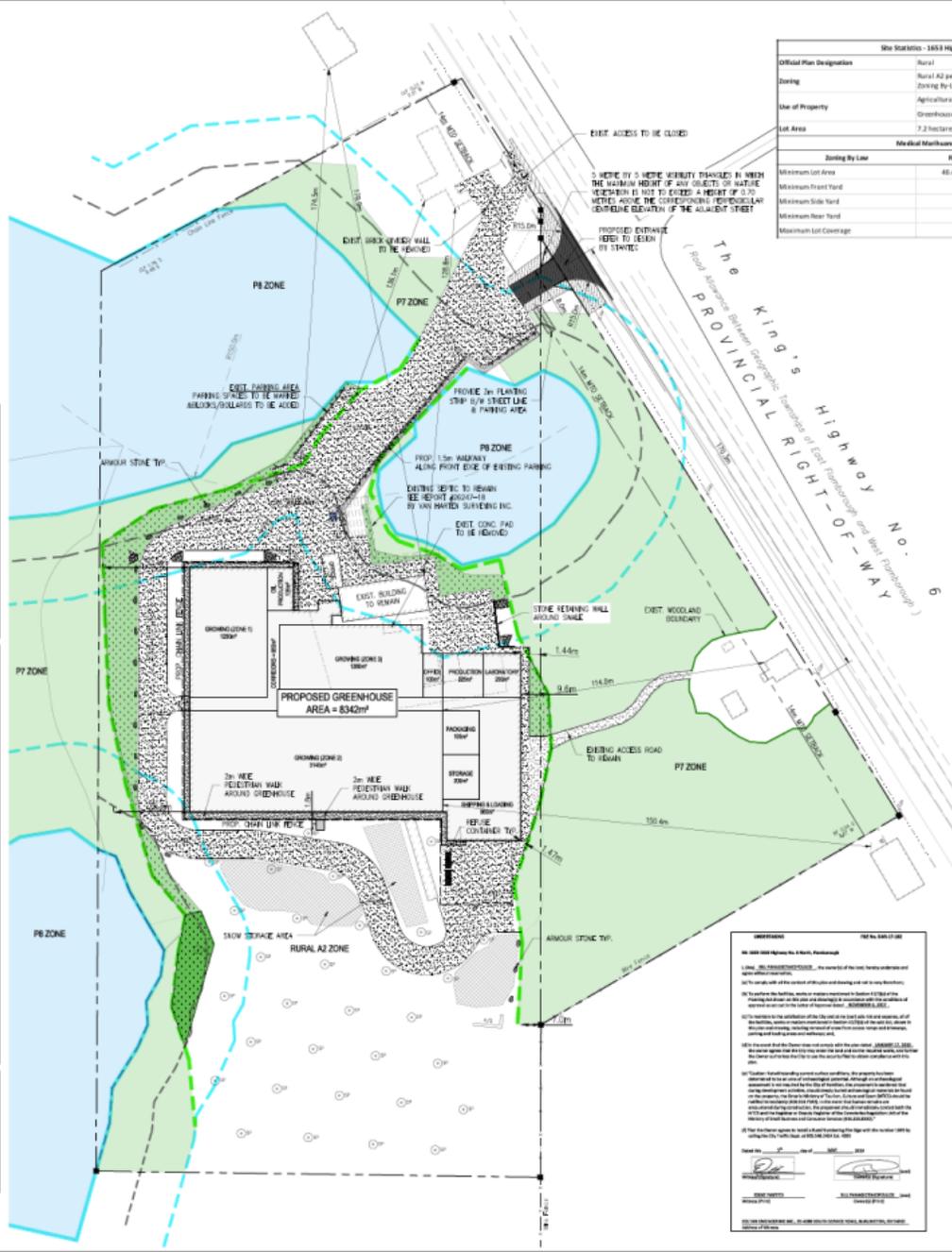
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- ALL OTHERS FROM PROPERTY LINES FOR THE FIRST 7.5m SHALL BE WITHIN THE WETLAND ZONE. THEREAFTER, ALL OTHERS SHALL BE WITHIN 15m UNLESS OTHERWISE SPECIFIED.
- THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNER'S CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS NORMALLY REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS, BUT NOT LIMITED TO THE FOLLOWING:
 - 5.1. BUILDING PERMIT
 - 5.2. ROAD CUT PERMITS
 - 5.3. APPROACH APPROVAL PERMITS
- ABANDONED ACCESSSES MUST BE REPAIRED AND THE CURBS AND BOLLARDS REINSTALLED WITHIN 10m OF THE OWNER'S EVIDENCE TO THE SATISFACTION OF THE CITY ENGINEER. SIGNAGE MUST BE REINSTALLED.
- FOR VISIBILITY TRIANGLES AT THE VEHICULAR ACCESS POINTS, THE FOLLOWING NOTE IS TO BE PROVIDED:

"5 METRES BY 5 METRES VISIBILITY TRIANGLES IN WHICH THE MAXIMUM HEIGHT OF ANY OBJECTS OR NATURAL VEGETATION IS NOT TO EXCEED A HEIGHT OF 0.70 METRES ABOVE THE CORRESPONDING PERPENDICULAR CONTIGUOUS ELEVATION OF THE ADJACENT STREET"
- THE PROPERTY IS SUITABLE FOR RECYCLING COLLECTION OF WASTE, RECYCLING, COMPOSTING, AND LEAF AND WASTE THROUGH THE CITY OF HAMILTON SUBJECT TO COMPLIANCE WITH SPECIFICATIONS INDICATED BY THE PUBLIC WORKS DEPARTMENT AND SUBJECT TO COMPLIANCE WITH THE CITY'S SOLID WASTE MANAGEMENT BY-LAW (20-01), AS AMENDED.

ARCHAEOLOGY NOTE:

"CAUTION: NOTWITHSTANDING CURRENT SURFACE CONDITIONS, THE PROPERTY HAS BEEN DETERMINED TO BE AN AREA OF ARCHAEOLOGICAL POTENTIAL. ALTHOUGH AN ARCHAEOLOGICAL ASSESSMENT IS NOT REQUIRED BY THE CITY OF HAMILTON, THE PROPOSER IS CAUTIONED THAT ANY DEVELOPMENT ACTIVITIES SHOULD BEADY REPAIRED ARCHAEOLOGICAL MATERIALS BE FOUND ON THE PROPERTY THE OWNERS MUST OF TRAINING, CULTURE AND SPORT (MCS) SHOULD BE NOTIFIED IMMEDIATELY (416-241-7443). IN THE EVENT THAT HUMAN REMAINS ARE ENCOUNTERED DURING CONSTRUCTION, THE PROPOSER SHOULD IMMEDIATELY CONTACT THE OFFICE OF THE REGIONAL OR HERITAGE RESEARCHER OF THE ONTARIO REGULATORY UNIT OF THE MINISTRY OF SMALL BUSINESS AND CONSUMER SERVICES (416-326-8302)."

0 10 20 30
SCALE - 1:750



Site Statistics - 1653 Highway 6, North

Official Plan Designation	Rural	
Zoning	Rural A2 per Section 12 of the City of Hamilton (Zoning By-Law 05-200)	
Use of Property	Agricultural	
Lot Area	7.2 hectares	
Zoning By-Law	Required	Prohibited
Minimum Lot Area	48.4 hectares	7.2 hectares
Minimum Front Yard	20m	7.6m
Minimum Side Yard	20m	6.0m
Minimum Rear Yard	20m	12.1m
Maximum Lot Coverage	70%	13.46%



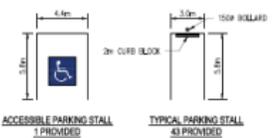
KEY PLAN NOT TO SCALE

Address/Section	Required By Code	Prohibited	Conforming/Non-Conforming
Minimum Lot Coverage Section 12.2.1.1 (A) of Zoning By-Law 05-200	7.2 ha	7.2 ha	Conforming
Minimum Front Yard Section 12.2.1.2 (A) of Zoning By-Law 05-200	20m	7.6m	Conforming
Minimum Side Yard Section 12.2.1.3 (A) of Zoning By-Law 05-200	20m	6.0m	Conforming
Minimum Rear Yard Section 12.2.1.4 (A) of Zoning By-Law 05-200	20m	12.1m	Conforming
Maximum Lot Coverage Section 12.2.1.5 (A) of Zoning By-Law 05-200	70%	13.46%	Conforming
Setback Section 12.2.1.6 (A) of Zoning By-Law 05-200	20m	7.6m	Conforming
Setback Section 12.2.1.7 (A) of Zoning By-Law 05-200	20m	6.0m	Conforming
Setback Section 12.2.1.8 (A) of Zoning By-Law 05-200	20m	12.1m	Conforming
Setback Section 12.2.1.9 (A) of Zoning By-Law 05-200	20m	7.6m	Conforming
Setback Section 12.2.1.10 (A) of Zoning By-Law 05-200	20m	6.0m	Conforming
Setback Section 12.2.1.11 (A) of Zoning By-Law 05-200	20m	12.1m	Conforming
Setback Section 12.2.1.12 (A) of Zoning By-Law 05-200	20m	7.6m	Conforming
Setback Section 12.2.1.13 (A) of Zoning By-Law 05-200	20m	6.0m	Conforming
Setback Section 12.2.1.14 (A) of Zoning By-Law 05-200	20m	12.1m	Conforming
Setback Section 12.2.1.15 (A) of Zoning By-Law 05-200	20m	7.6m	Conforming
Setback Section 12.2.1.16 (A) of Zoning By-Law 05-200	20m	6.0m	Conforming
Setback Section 12.2.1.17 (A) of Zoning By-Law 05-200	20m	12.1m	Conforming
Setback Section 12.2.1.18 (A) of Zoning By-Law 05-200	20m	7.6m	Conforming
Setback Section 12.2.1.19 (A) of Zoning By-Law 05-200	20m	6.0m	Conforming
Setback Section 12.2.1.20 (A) of Zoning By-Law 05-200	20m	12.1m	Conforming

NOTES

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These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design professional has not entered into a contract.

Do not make drawings. The contractor shall check and verify all dimensions and report any errors and omissions to the engineer. This drawing is not to be used for construction unless marked as "Issued for construction", certified and dated.

PART OF LOTS 9 AND 10 CONVEYANCE IS GEOGRAPHIC TOWNSHIP OF WEST FLAMBOROUGH

TOWN OF FLAMBOROUGH

REFER TO THE FOLLOWING DOCUMENTS:

- LEGAL SURVEY & TOPOGRAPHY
- YOUNG & YOUNG SURVEYING PROJECT (11-17893) DATED: OCTOBER 20, 2017
- STORMWATER MANAGEMENT SHEET PROJECT (160961221) DATED: SEPTEMBER 10, 2018

REV.	DATE	REMARKS
13	05/04/19	SUBMISSION #1
12	24/01/18	SUBMISSION #2
11	24/01/18	ISSUED FOR VARIANCE
10	22/01/18	REVISED ENTRANCE
9	04/01/18	SUBMISSION #4
8	14/04/18	SUBMISSION #3
7	27/01/18	REVISED FOR APPROVAL
6	22/01/17	REVISED FOR CLARIFICATION
5	08/01/17	SUBMISSION #2
4	11/01/17	REVISED FOR SPA
3	13/07/17	ISSUED FOR SPA
2	10/04/17	ISSUED FOR REVIEW
1	27/04/17	ISSUED FOR APPROVAL
0	20/04/17	ISSUED FOR SUBMISSION

ZOLTAN ENGINEERING
4380 S Service Road, Suite #25
Burlington, ON L7L 5Y6
Tel: 905.331.8307 • Fax: 905.331.6840

PROJECT TITLE
PROPOSED GREENHOUSE FACILITY
1649 HIGHWAY 6 N

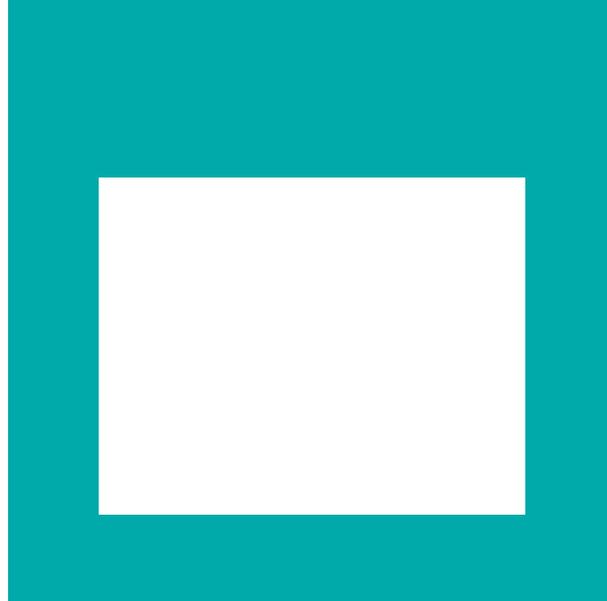
FLAMBOROUGH ONTARIO

DRAWING TITLE
SITE PLAN

SCALE AS NOTED

DRAWN: CHM/ATP
DESIGNED: JL
CHECKED: JL

PROJECT No. 17-112 SHEET No. SP1



WELCOME TO THE CITY OF HAMILTON

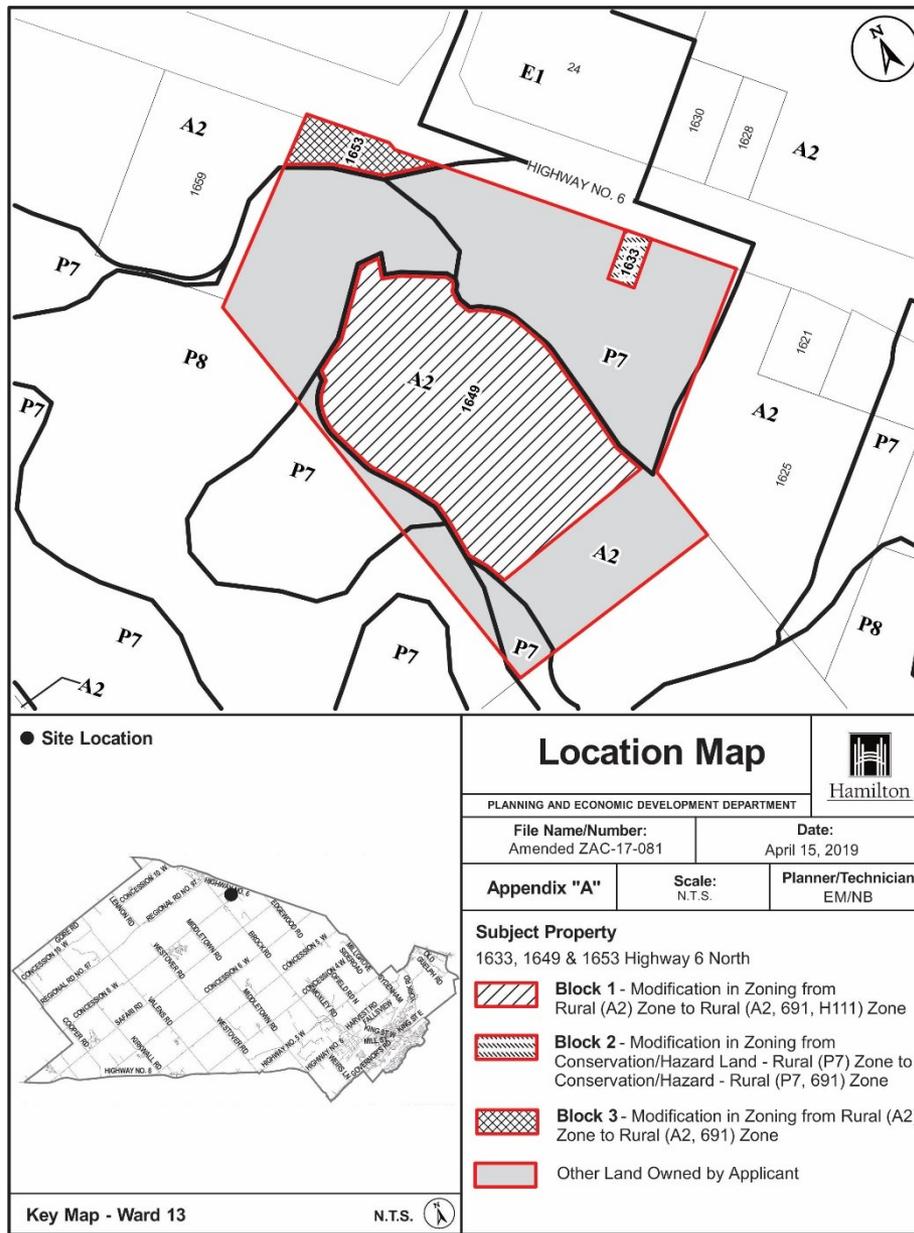
PLANNING COMMITTEE

May 14, 2019

PED19076 – (ZAC-17-081)

Applications for an Amendment to the Rural Hamilton Official Plan and the City of Hamilton Zoning By-law No. 05-200 for Lands Located at 1633, 1649 and 1653 Highway No. 6 North, Flamborough.

Presented by: Elyse Meneray

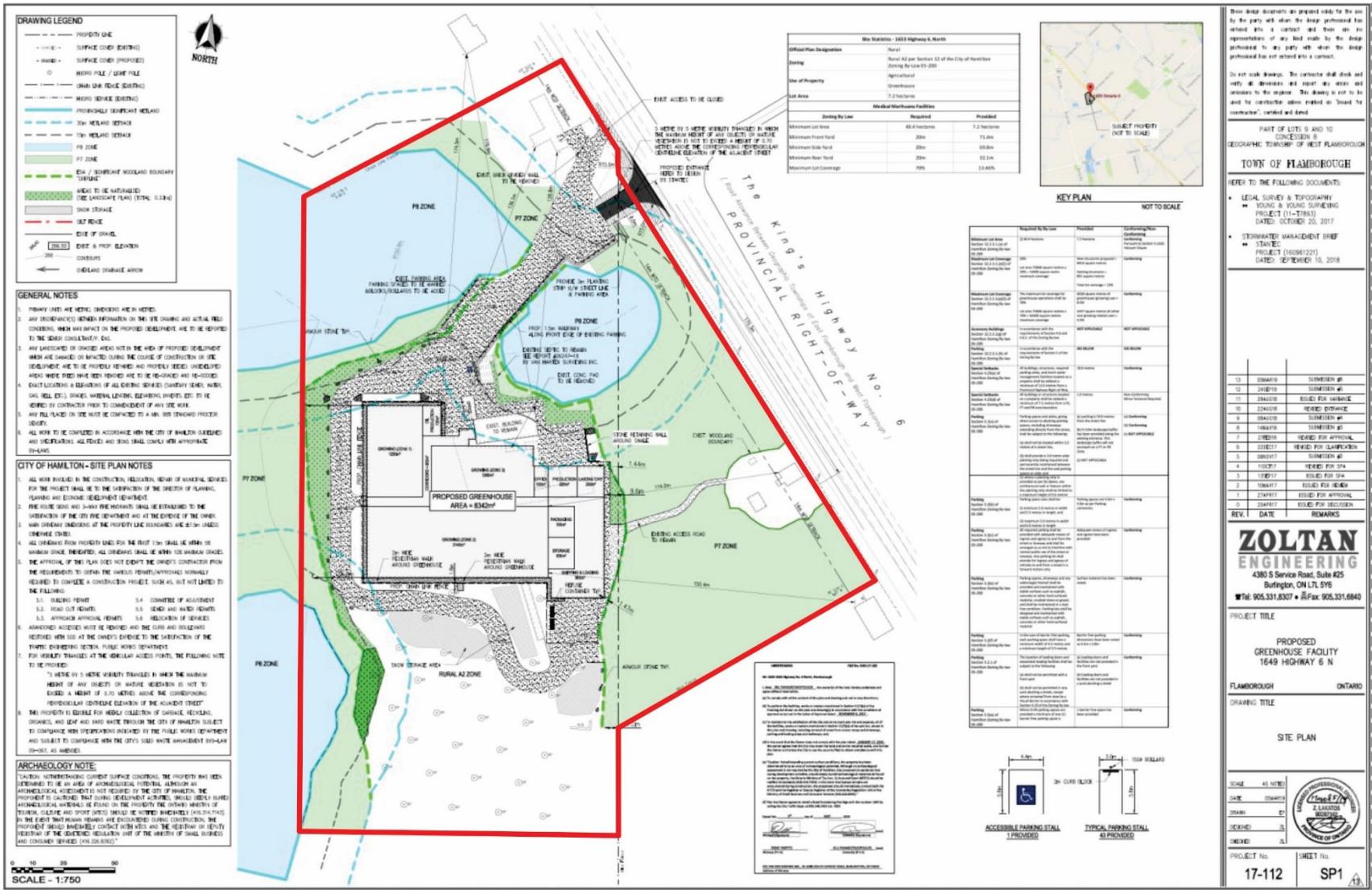


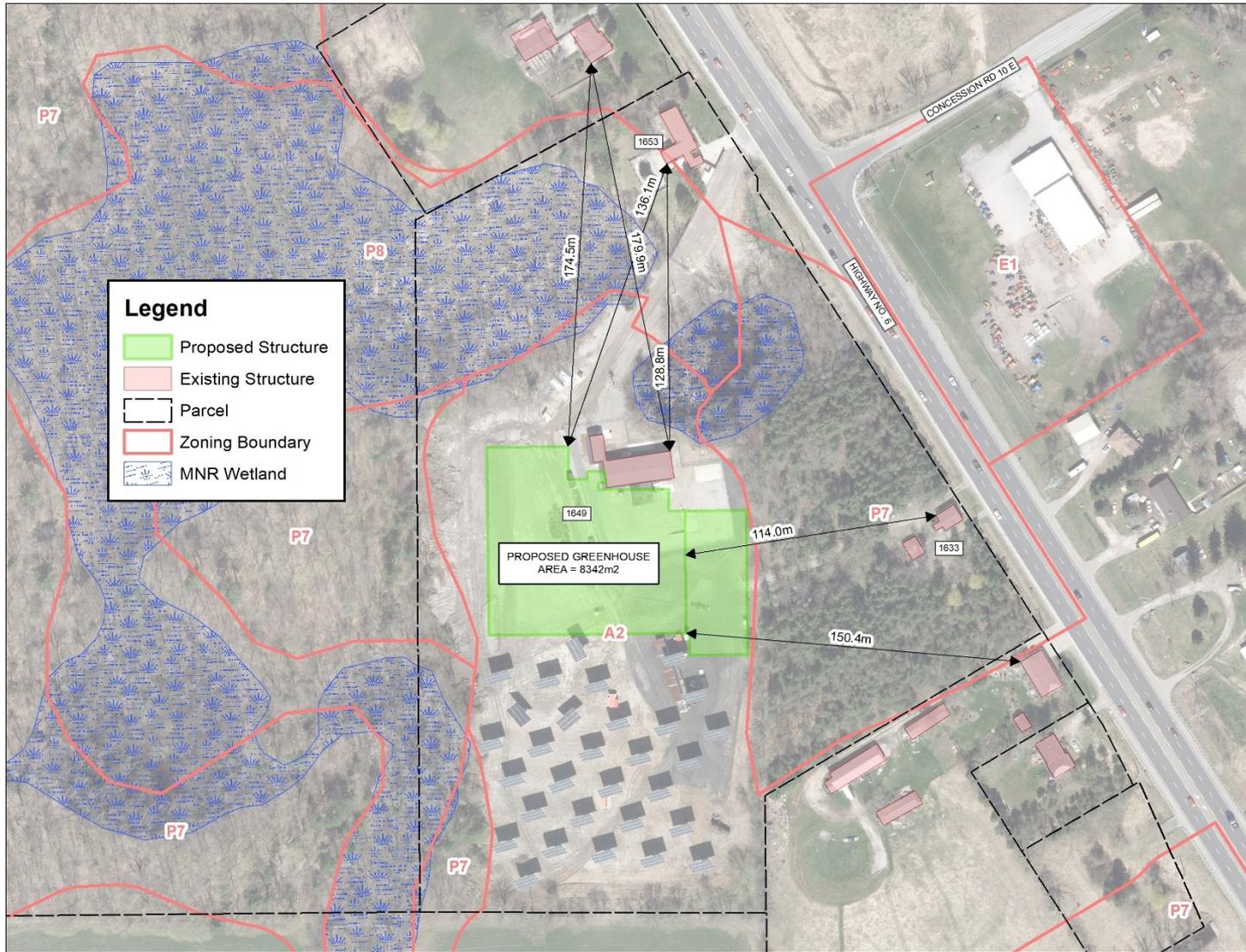


SUBJECT PROPERTY



1633, 1649 & 1653 Highway 6 North, Flamborough







1653 Highway No. 6 North



1633 Highway No. 6 North



Existing Facility



North of the Subject Lands



Adjacent property to the east



Regional Tractor Sales and Servicing Limited



Wetland to the north



Wetland and Significant Woodlot to the northwest



Significant Woodlot to the west



Solar Panels to the south



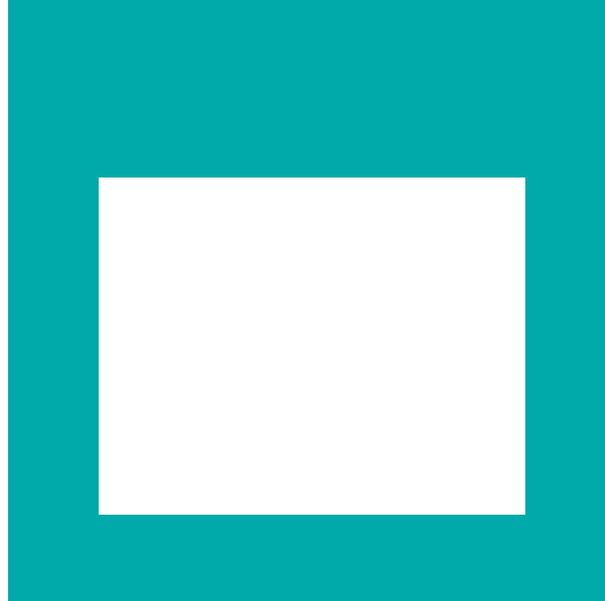
Significant Woodlot to the east



Significant Woodlot to the east



Reduced VPZ



THANK YOU FOR ATTENDING

THE CITY OF HAMILTON PLANNING COMMITTEE



CITY OF HAMILTON
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Licensing and By-law Services Division

TO:	Chair and Members Planning Committee
COMMITTEE DATE:	May 14, 2019
SUBJECT/REPORT NO:	Comprehensive Review of Discharge of Firearms By-law (PED16107(b)) (City Wide) (Outstanding Business List Item)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Robert Ustrzycki (905) 546-2424 Ext. 4721
SUBMITTED BY:	Ken Leendertse Director, Licensing and By-law Services Planning and Economic Development Department
SIGNATURE:	

RECOMMENDATION(S)

- (a) That the by-law attached as Appendix "A" to Report PED16107(b), which repeals and replaces the Discharge of Firearms By-law 05-114, that incorporates the recent and future urban developments in the City and that includes key aspects of a comprehensive review and public consultation process, and which has been prepared in a form satisfactory to the City Solicitor, be enacted;
- (b) That a new exemption permit application fee of \$100 and renewal fee of \$20 for the discharge of recreational firearms or bows be approved, and that the User Fees and Charges By-law be amended accordingly;
- (c) That the item respecting the Comprehensive Review of the Discharge Firearm By-law be considered complete and removed from the Planning Committee Outstanding Business List.

EXECUTIVE SUMMARY

City staff was directed to undertake a comprehensive review of the Discharge of Firearms By-law 05-114, including public consultation, for recommendations to an effective and updated by-law that incorporates the recent and future urban

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

SUBJECT: Comprehensive Review of Discharge of Firearms By-law (PED16107(b)) (City Wide) - Page 2 of 9

developments in the City. Staff Report PED16107(a) dated February 20, 2018 provided Committee the results of the comprehensive review, including a summary of the public and stakeholder consultations, and the analysis of a Working Group examining the comments and input from the public engagement process.

Licensing and By-law Services staff were directed to consult with Legal Services and develop and bring forward to the Planning Committee an updated by-law to repeal and replace City of Hamilton Discharge of Firearms By-law 05-114, that incorporates the recent and future urban developments in the City and includes the key aspects generated by the public engagement process as contained in Report PED16107(a).

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial/Staffing: The cost of the proposed by-law in Planning Committee Report PED16107(b) (Attached as Appendix “A”) would not have an impact on current Licensing and By-law Services (LBS) resources or change the annual operating budget.

While no applications or exemption permits have been issued under the current Discharge Firearm By-law 05-114, LBS staff recommend an application fee of \$100 and renewal fee of \$20 to reduce the administrative costs for receiving, processing and approving exception permit applications.

Legal: Public Notice was provided to consider the permit fees proposed in Report PED16107(b), as required by the City of Hamilton Public Notice By-law 07-351.

HISTORICAL BACKGROUND

The City of Hamilton Discharge of Firearms By-law 05-114, enacted on May 11, 2005 regulates where firearms may be discharged in the City for the safety of the inhabitants. The current by-law is a compilation of the former municipalities of the City (Report PD05119, Harmonization of Discharge of Firearm By-law, dated April 15, 2005) with no revision since its day of passing.

On August 10, 2015 General Issues Committee received Report LS15020 (Regulating Guns and/or Ammunition) regarding options with respect to the City’s authority over guns and/or ammunition. General Issues Committee was informed by the City Solicitor that the Discharge of Firearms By-law is in need of updating, that would require

SUBJECT: Comprehensive Review of Discharge of Firearms By-law (PED16107(b)) (City Wide) - Page 3 of 9

consultation with the stakeholders, and be modified to clearly re-inforce the federal and provincial regulation of firearms.

At its meeting of September 23, 2015, Council approved information item h(ii) of Planning Committee Report 15-014 which reads as follows:

- (a) That Municipal Law Enforcement staff, in consultation with Legal Services and Planning staff as well as the Hamilton Police Service, undertake a comprehensive review of the Discharge of Firearms By-law 05-114, including stakeholder consultation, and
- (b) That staff be directed to report back with recommendations for the most effective Discharge of Firearms By-law including, but not limited to, consideration of where the discharge of firearms is permitted.

On May 25, 2016 City Council approved item 8.1 of Planning Committee Report 16-010 to receive Discharge of Firearms Report (PED16107) informing Members of Council that more analysis is needed to update the substantive provisions of the current by-law, and outlining the process intended by staff to:

- Establish a working group to review public comments, the overlapping jurisdictions, respective roles, safety issues, criteria for high risk areas, strategies and tasks necessary for an enforcement/administration/communication plan;
- Consult with City Councillors representing rural Wards;
- Consult with the numerous stakeholders and property owners having interest; and,
- Conduct a broader research of best practices in other jurisdictions.

On February 20, 2018 Report PED16107(a) provided the Planning Committee the results of the public consultation and comprehensive review. City Council directed LBS staff to consult with Legal Services to develop and bring forward to the Planning Committee an updated by-law to repeal and replace City of Hamilton Discharge of Firearms By-law 05-114.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The City of Hamilton Discharge of Firearms By-law 05-114

Staff review considered the following applicable Provincial and Federal Legislation:

Fish and Wildlife Conservation Act, 1997, S.O. 1997, c. 41

Conservation Authorities Act, R.S.O. 1990, c. C.27

**SUBJECT: Comprehensive Review of Discharge of Firearms By-law
(PED16107(b)) (City Wide) - Page 4 of 9**

Protection of Livestock & Poultry from Dogs Act, R.S.O. 1990, c. L.24

Animal Health Act 2009, S.O. 2009, c. 31

Trespass to Property Act, R.S.O. 1990, c. T.21:

Occupiers Liability Act, R.S.O. 1990, c. O.2

Municipal Act, 2001, S.O. 2001, c. 25

Heritage Hunting and Fishing Act, 2002, S.O. 2002, c. 10

Criminal Code, R.S.C., 1985, c. C-46

Firearms Act, S.C. 1995, c. 39

Migratory Birds Convention Act, 1994, S.C. 1994, c. 22

Navigable Waters Protection Act (Canada)

RELEVANT CONSULTATION

Public Engagement

City staff hosted public consultations with stakeholders and persons having interest to gain community feedback. A meeting of stakeholders was conducted at Hamilton City Hall on January 26, 2017; and a total of 3 Open Public Meetings were held from February 13, 2017 to March 1, 2017 in Glanbrook, Rockton and Ancaster (detailed in Report PED 16107(a)).

An additional Open Public Meeting was held May 15, 2018 inviting the residents from the concession area east of Copetown to re-examine a proposed boundary expansion prohibiting the discharge of firearms. It was the consensus of property owners in attendance that the discharge of recreational firearms remains unchanged to those lands.

Councillors for Wards 11, 12, 14 and 15 were consulted in the comprehensive review and facilitated arrangements for the Open Public Meetings in the rural community. LBS staff updated and consulted with those Councillors not familiar or privy to the results of the comprehensive review in 2018.

The following internal departments were consulted in the comprehensive review:

- Planning;
- Legal Services;
- Public Works (Parks);
- Healthy and Safe Communities (Recreation);
- Senior Project Manager for Indigenous Community Affairs; and,
- Agricultural/Rural Affairs Committee.

OUR Vision: To be the best place to raise a child and age successfully.

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SUBJECT: Comprehensive Review of Discharge of Firearms By-law (PED16107(b)) (City Wide) - Page 5 of 9

An advisory group (Working Group) was established from key professionals with extensive experience and knowledge in the administration, enforcement, education and use of firearms and public safety from the following agencies:

- Hamilton Municipal Law Enforcement;
- Hamilton Police Services;
- Hamilton Conservation Authority;
- Ontario Federation of Anglers and Hunters; and,
- Ministry of Natural Resources (declined involvement).

ANALYSIS AND RATIONALE FOR RECOMMENDATION(S)

The goal and objective of the comprehensive review of the Discharge of Firearms By-law was to:

1. Update the Schedule Map(s) where the discharge of firearms is prohibited to incorporate recent and future urban development.
2. Determine if the current provisions provide a clear understanding of its provisions, balances the varied needs of the community, maintains public safety, and reinforces federal/provincial firearm regulations.

The public consultations provided a broad and diverse outlook to develop the following fundamental improvements to administer and enforce the By-law:

- Simplify the overall structure of the By-law and mapping;
- Provide better wording and understanding;
- Eliminate any ambiguity;
- Provide separate regulations for archery;
- Improve public education and communication; and,
- Improve and unify enforcement.

The Working Group reviewed and analysed the public and stakeholder comments to the boundary expansion and substantive issues to balance the overall needs of the community that considers:

- applicable legislation;
- current by-law provisions;
- best practices in other jurisdictions;

**SUBJECT: Comprehensive Review of Discharge of Firearms By-law
(PED16107(b)) (City Wide) - Page 6 of 9**

- safety issues;
- demographics for boundary changes; and,
- criteria for high risk areas.

Attached as Appendix “A” to Report PED16107(b) is the draft Discharge of Recreational Firearm By-law (Proposed By-law) to repeal and replace the current Discharge of Firearms By-law 05-144. The Proposed By-law reflects the majority of public opinion generated by the public engagement process and key aspects of the comprehensive review in Report PED16107(a). The current Discharge Firearm By-law 05-144 is attached as Appendix “B” to this Report.

The general intent and purpose of the Proposed By-law is public safety in the discharge of recreational firearms/bows which is reflected in the Short Title name of the By-law. The Proposed By-law is prepared in simple, plain text, divided into nine parts. It considers what is in the best interest of all the inhabitants and fair to all persons by not being too restrictive or more lenient.

The preamble specifies the statutory authorities for establishing the Proposed By-law, and deems that the discharge of firearms could create a safety hazard for the public. The city-wide and rural settlement Schedule Maps include the recent and future urban developments, and accurately denote the areas where the discharge of a firearm or bow is prohibited. The Schedule Maps are prepared in PDF format to meet the visual needs of the reader, and may be enlarged to greatly improve the ability to distinguish the prohibited areas.

The following annotations speak to the key aspects or changes in the Proposed By-law.

Definitions

The by-laws from other jurisdictions, federal/provincial legislation, and case law were examined in preparation of the definition section. To support the strong public opinion, bows remain and apply outside the definition of firearm and any reference to a firearm as a weapon is removed.

Public centres, parks and trails are better defined to be more inclusive of those locations that may be frequented by the public. Other definitions are modernized or reformed to the outdated current by-law.

Application of By-law

To understand the extent or limitations of the Proposed By-law, section 3 clearly identifies those circumstances in which the By-law does not apply, namely the lawful

**SUBJECT: Comprehensive Review of Discharge of Firearms By-law
(PED16107(b)) (City Wide) - Page 7 of 9**

use of firearms by the military, police agencies, regulated gun clubs/ranges, and the firing of blank ammunition.

General Prohibitions

The locations that prohibit the recreational use of firearms and bows are provided in sections 4 – 7. The onus remains on the user of recreational firearm or bow to obtain the express consent of the owner of land. Section 8 defines the prohibited areas and provides separation requirements, which reflect the diverse settings in the rural community that would be difficult to accurately plot on a map.

The current 100 m separation maintains as an appropriate distance from public locations and occupied buildings for firearms. Supported by public opinion, the reduced limit of 50 m introduced for bows/archery is consistent with best practices in other jurisdictions. These separation requirements may be relaxed with the express consent of the owner/occupier of the building or structure.

A new separation distance of 300 m is provided for the safety and security of airports and registered aerodromes within the City of Hamilton.

Exceptions

The exceptions in the Proposed By-law continue to recognize the importance of the discharge of firearms for farmers; and the education for the safe use of recreational firearms and bows. Other uses identified by stakeholder and public consultation as having merit as an exception are added to the Proposed By-law, including the lower risks associated with the use of archery, paintball and airguns within a secure indoor facility.

Permits and Appeal

Considering the demographics of the City, the exemption permit currently in place is the best solution dealing with extraordinary circumstances where the general provisions may not be reasonable. Although no application has come forward since the passing of the current Discharge of Firearms By-law, continuing this practise allows for specific exceptions not envisaged by the Proposed By-law or the Schedule Maps.

The LBS Director is authorized to grant, refuse or revoke an exemption permit, and impose conditions specific to the application after having consideration to the negative effects in high risk areas. Appeals to the permit application are made before the Planning Committee, whereas appeals under the current by-law are heard by Council.

**SUBJECT: Comprehensive Review of Discharge of Firearms By-law
(PED16107(b)) (City Wide) - Page 8 of 9**

Administration and Enforcement

The LBS Director is authorized to administer and enforce the Proposed By-law, including the authority to prescribe the format and content of any required forms or documents.

Enforcement and Penalties

The penalty for contravening the Proposed By-law provides for a minimum fine of \$500 and maximum fine of \$100,000, demonstrating the seriousness envisioned by Council. The landowner consenting to the use of their property for the recreational use of firearms may also be charged for knowingly permitting the unlawful activity.

Officers may enter upon land at any reasonable time, without notice, or in conjunction with a person possessing special or expert knowledge for the purpose of carrying out an inspection. This administrative power of entry includes specific inspection powers for the production of documents or information. Obstructing or refusing an Officer exercising a power or performing an inspection is a contravention of the *Municipal Act, 2001*.

Officers generally arrive before or after the discharge of a firearm or bow, and commonly deal with the property owner when unable to locate/identify the suspect(s). Staff experience has been that most offenders are unfamiliar with the provisions of the By-law, or mistake the boundary for prohibited areas. Municipal Orders may be issued to discontinue the activity, or compel the landowner to revoke consent or take actions to bar or prevent the unlawful entry onto the property. The Municipal Order is an educational tool issued in the first instance before taking enforcement steps. Once issued, having presumed knowledge of the By-law, a charge would follow for disobeying the order and/or require any remedial action at the property owner's expense.

Repeal and Enactment

The Proposed By-law, to repeal and replace the current outdated Discharge of Firearms By-law, considers public opinion and the key issues identified from the comprehensive review.

Enforcement Strategy

The general public has a misunderstanding of the current Discharge of Firearms By-law and are frustrated by the lack of response, public education, and disconnect of the enforcement agencies. There is need for solutions directing calls to the correct service for information or action; and to examine and improve methods to educate the public.

LBS staff consulted with other enforcement agencies and authorities in preparation of the Enforcement Strategy (Attached as Appendix "C" to Report PED16107(b)) and will

SUBJECT: Comprehensive Review of Discharge of Firearms By-law (PED16107(b)) (City Wide) - Page 9 of 9

continue to engage in discussions to improve service in the administration and enforcement of the Proposed By-law.

An effective communication plan is the best tool available to inform the public of their legal obligations and prevent contraventions of the By-law. Members of the public are seeking accurate information in a user friendly format. The Enforcement Strategy includes the creation of an information pamphlet containing excerpts from the Proposed By-law and related legislation, contact information for enforcement agencies, and links to the City website. It is intended that this information, the By-law and Schedule Maps be posted on the City website, along with hard copies available to the public at strategic locations in the City.

ALTERNATIVES FOR CONSIDERATION

N/A

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN**Community Engagement and Participation**

Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Economic Prosperity and Growth

Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Healthy and Safe Communities

Hamilton is a safe and supportive City where people are active, healthy, and have a high quality of life.

Culture and Diversity

Hamilton is a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.

Our People and Performance

Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A": Discharge of Recreational Firearms By-law

Appendix "B": Discharge of Firearms By-law 05-114

Appendix "C": Enforcement Strategy

KL:RU:st

Appendix "A" to Report PED16107(b)

Page 1 of 9

Authority: Item:
Report (PED16107(b))
CM:
Ward: City Wide

Bill No.

CITY OF HAMILTON

BY-LAW NO.

**To repeal and replace By-law No. 05-114,
being a by-law to regulate the discharge of firearms**

WHEREAS subsection 10(1) of the *Municipal Act, 2001* provides that single-tier municipalities may provide any service or thing that the municipality considers necessary or desirable for the public; and pursuant to paragraphs 6 and 8, may pass by-laws respecting the health, safety and well-being of persons and the protection of and property;

WHEREAS pursuant to section 119 of the *Municipal Act, 2001*, a municipality is authorized to prohibit or regulate the discharge of guns or other firearms, air-guns, spring-guns, cross-bows, long-bows or any other weapon for the purpose of safety;

WHEREAS pursuant to subsection 23.1(1) of the *Municipal Act, 2001*, a municipality is authorized to delegate its powers and duties under the Act, subject to certain restrictions;

WHEREAS pursuant to section 425 of the *Municipal Act, 2001*, a municipality is authorized to pass by-laws providing that a person who contravenes a by-law of the Municipality passed under the *Municipal Act, 2001* is guilty of an offence;

WHEREAS pursuant to section 429 of the *Municipal Act, 2001*, a municipality may establish a system of fines for offences under a by-law of the Municipality passed under the *Municipal Act, 2001*;

WHEREAS pursuant to section 436 of the *Municipal Act, 2001*, a municipality may pass a by-law providing that the municipality may enter on land at any reasonable time for the purpose of carrying out an inspection to determine whether or not there is compliance with a by-law, direction, order, or condition of license passed or made under the *Municipal Act, 2001*;

WHEREAS sections 444 and 445 of the *Municipal Act, 2001* provides that if a municipality is satisfied that a contravention of a by-law passed under the *Municipal Act, 2001* has occurred, that the municipality may make an order requiring the person who contravened the by-law or caused or permitted the contravention or the owner or occupier of the land to discontinue the contravention or do work to correct the contravention of the by-law;

Appendix “A” to Report PED16107(b)**Page 2 of 9**

WHEREAS the Council for the City of Hamilton deems that the discharge of firearms could create a safety hazard for the public;

NOW THEREFORE the Council of the City of Hamilton enacts as follows:

SHORT TITLE

1 This By-law may be cited as the Discharge of Recreational Firearms By-law.

DEFINITIONS

2 In this By-law,

“bow” means a curved or re-curved, stave of a resilient material strung taut from end to end and used to launch an arrow, a bolt, a quarrel, or any similar projectile and includes a crossbow, longbow, compound bow, re-curve bow, or any class thereof;

“City” means the City of Hamilton;

“Council” means the Council for the City of Hamilton;

“Committee” means the Planning Committee established by Council for the City of Hamilton;

“Director” means the City’s Director of Licensing and By-law Services and their designate or successor;

“firearm” means any type of gun or similar barrelled device from which any shot, bullet or other projectile can be discharged and that is capable of causing bodily injury or death, and includes air gun, spring-gun, pellet gun or paint ball gun;

“highway” means a common and public highway and includes a street, bridge or other structure forming part of a highway over or across which a highway passes, and includes the whole of a road allowance under the jurisdiction of the City;

“land” includes any public or private property, premises, grounds, yards or vacant lot and includes land owned by a Conservation Authority or agreement forest established by or under the *Conservation Authorities Act*;

“Officer” means a police officer, municipal law enforcement officer, officer appointed under the *Fish and Wildlife Conservation Act, 1997* or *Conservation Authorities Act*, or other person appointed to enforce the provisions of this By-law;

“person” includes a company, a corporation, a partnership, or an individual Person;

“park” means a private or public park or recreational area that is open to the general public for sports, recreational uses and like activities, and includes open space, campgrounds and picnic area;

Appendix "A" to Report PED16107(b)**Page 3 of 9**

"public centre" means a parcel of land on which is situated a cemetery, place of worship, public hall, community centre, day nursery, community sports facility, hospital, school or golf course; and

"public trail" means a managed pathway or designated travel corridor which is open to use by the general public for the purposes of walking, biking, hiking, cross country skiing or other means of recreational travel.

APPLICATION OF BY-LAW

3 This By-law does not apply to,

- (a) a peace officer, police officer or member of the Canadian Armed Forces in the performance of their duty;
- (b) a person appointed as an animal control officer, municipal law enforcement officer, or as an agent for the City or for a provincial or federal government agency for the purpose of destroying sick, injured or vicious animals as authorized by law in the performance of this stated duty;
- (c) a bona fide gun club or range, registered and regulated by the *Firearms Act* (Canada), the use and location of which is permitted pursuant to the applicable zoning by-law and building requirements and any other applicable federal, provincial and municipal laws;
- (d) a facility operated by or for a municipal, provincial or federal police force;
- (e) any device designed and intended by the person in possession therefore, for use exclusively for signalling, notifying of distress or firing stud cartridges, explosive-driven rivets or similar industrial ammunition, or firing blank cartridges;
- (f) the firing of blank ammunition which does not discharge a projectile for or in connection with lawful use in a motion picture, television and stage productions, ceremonial military memorial services, military re-enactments and historical displays or educational programs, or for the purpose of starting or controlling a sporting event.

GENERAL PROHIBITIONS

4 No person shall discharge a firearm or bow in the City except in accordance with this By-law.

5 No person shall discharge or cause to be discharged or allow to be discharged, a firearm or bow on any land except with the express consent of the owner of the land.

6 (1) No owner or occupier of land where the discharge of a firearm or bow is prohibited pursuant to section 8 shall knowingly allow any person to discharge a firearm or bow on such land.

Appendix "A" to Report PED16107(b)**Page 4 of 9**

(2) Where a contravention of this By-law has occurred, every owner of land shall take reasonable precautions to prevent the continuation or repetition of the contravention on such land.

7 No person shall discharge or cause to be discharged or allow to be discharged a firearm or bow between half an hour after sunset to half an hour before sunrise unless otherwise permitted under the *Fish and Wildlife Conservation Act, 1997*, or regulations thereunder.

8 (1) For the purposes of this section, a prohibited area is any of the following:

- (a) lands within the urban boundary as set out on Schedule D to the Rural Hamilton Official Plan;
- (b) lands within a rural settlement area, which are as shown as "Firearms & Bows Prohibited" on the maps in Schedule A, which forms part of this By-law;
- (c) lands zoned residential;
- (d) a park;
- (e) a public centre;
- (f) a public trail.

(2) No person shall discharge or cause to be discharged or allow to be discharged, a firearm or bow within any of the following locations:

- (a) a prohibited area;
- (b) within 300 m of the John C. Munro Hamilton International Airport or a registered aerodrome;
- (c) on or within any watercourse or body of water defined as navigable water pursuant to the *Navigable Waters Protection Act (Canada)*;
- (d) on, over or across any highway, railway or portion thereof;
- (e) within an unopened road allowance.

(3) In addition to subsection (1), no person shall discharge or cause to be discharged or allow to be discharged,

- (a) a firearm within 100 m of any of the following locations:
 - (i) a prohibited area;
 - (ii) any occupied dwelling, building or structure except with the express consent of the owner or occupier of the dwelling, building or structure.
- (b) a bow within 50 m of any of the following locations:

Appendix "A" to Report PED16107(b)**Page 5 of 9**

- (i) a prohibited area;
- (ii) any occupied dwelling, building or structure except with the express consent of the owner or occupier of the dwelling, building or structure.

EXCEPTIONS

9 Sections 7 and 8 do not apply to:

- (a) a farmer or their agent discharging a firearm or bow on land owned by the farmer in order to scare or destroy animals that are found in the act of killing or injuring livestock or poultry or destroying their property, provided that such discharge complies with any of the following:
 - (i) *Migratory Birds Convention Act, 1994* (Canada);
 - (ii) *Fish and Wildlife Conservation Act, 1997*; or
 - (iii) *Protection of Livestock and Poultry from Dogs Act*;
- (b) a trapper licensed by the Ministry of Natural Resources in accordance with the *Fish and Wildlife Conservation Act, 1997* to hunt and trap fur-bearing mammals;
- (c) the discharge of a bow, air gun, spring-gun, pellet gun or paint ball gun provided that such discharge takes place within a secure indoor facility where there is no danger of any projectile fired or discharged therein passing out of the building or into any other part of the building;
- (d) the discharge of a bow at a competition, educational or recreational event sanctioned by a school board, the Federation of Canadian Archers, the Ontario Association of Archers, Ontario Federation of Anglers and Hunters, or the Rockton Agricultural Society; or
- (e) land owned by, or under the control of a Conservation Authority where the discharge of a firearm or bow is permitted.

PERMITS AND APPEAL

10 (1) Any person may apply for an exemption permit from this By-law or any provision of it.

(2) An application for an exemption permit shall be made at least sixty (60) days before the event for which the exemption is sought.

(3) The exemption permit application shall be made in writing to the Director, in the form prescribed by the Director, and shall contain the following:

- (a) the name, address and telephone number of the applicant and owner of the property where the event will occur;

Appendix "A" to Report PED16107(b)**Page 6 of 9**

- (b) the period of time for which the exemption is sought, including time of day and duration;
- (c) the reasons why the exemption is sought;
- (d) the type of firearm or bow to be used;
- (e) proof that the person seeking the exemption has notified, in writing, all owners of property within 100 m of the perimeter of the property where the event will take place, that an exemption to the By-law is being sought; and
- (f) a detailed map showing:
 - (i) the surrounding residential areas and properties;
 - (ii) the location and uses of all buildings and structures on and within 100 m of the subject lands;
 - (iii) the form and location of a safe backstop to be used where the discharge of firearm or bow will occur.

(4) An application for an exemption permit shall be accompanied by the fee as set out in the City's User Fees and Charges By-law, or as otherwise set and approved by Council from time-to-time.

11 (1) Upon receipt of a completed application for an exemption permit, the Director may:

- (a) issue the exemption permit subject to such conditions as the Director may determine; or
- (b) refuse the exemption permit.

(2) An application for an exemption permit for the discharge of a firearm or bow from an activity that is prohibited under any other by-law shall be refused by the Director.

(3) In considering an application for an exemption permit, the Director shall have regard to:

- (a) any negative effects the issuance of the exemption permit may have on neighbouring properties or on the City;
- (b) any previous violations of this By-law or an exemption permit by the applicant; and
- (c) any other factors that the Director considers relevant to the decision.

(4) Where the Director refuses the exemption permit, a notice including the date and grounds for the Director's refusal will be sent by regular or registered mail to the applicant to the last known address on file.

Appendix "A" to Report PED16107(b)**Page 7 of 9**

12 (1) An applicant for an exemption permit may appeal the decision of the Director to the Committee within ten (10) days of the Director's decision being made by sending a notice of appeal in writing to the Director, including the grounds for their appeal and accompanied by the fee as set out in the City's User Fees and Charges By-law.

(2) Upon receipt of a completed appeal and accompanied fee, the Director shall prepare a report to Committee with respect to the exemption permit application and notify the applicant once an appeal date before the Committee has been set and if the applicant does not attend on the appeal date, the Committee may proceed in their absence and the applicant shall not be entitled to further notice in the proceeding.

(3) The Committee shall consider the Director's report and recommend to Council that an exemption permit be refused or issued, or that a condition imposed on an exemption permit.

(4) Council may uphold or vary the recommendation(s) of the Committee or do any act or make any decision it might have done had it conducted the appeal itself and the decision of Council is final.

13 Failure to comply with any of the terms or conditions of an Exemption Permit shall render the exemption null and void.

ADMINISTRATION

14 (1) The Director is authorized to administer and enforce this By-law including,

(a) arranging for:

- (i) the assistance or work of City staff, City agents or the assistance of police officers;
- (ii) the making of orders or other requirements and the imposition of conditions as authorized under this By-law;
- (iii) the obtaining of court orders or warrants as may be required;
- (iv) the commencement of such actions on behalf of the City to recover costs or restrain contravention of this By-law as deemed necessary;

(b) prescribing the format and content of any forms or other documents required under this by-law.

(2) The Director may assign Officers to enforce this By-law and Officers so assigned or appointed by Council to enforce this By-law shall have the authority to:

- (a) carry out inspections;
- (b) make orders or other requirements as authorized under this By-law; and
- (c) give immediate effect to any orders or other requirements made under this By-Law.

Appendix "A" to Report PED16107(b)**Page 8 of 9**

(3) The Director may assign duties or delegate tasks under this By-law to be carried out in the Director's absence or otherwise.

ENFORCEMENT AND PENALTIES

15 Every person who contravenes any of the provisions of this By-law is guilty of an offence and upon conviction is liable to a fine of not less than \$500 and not more than \$100,000.

16 (1) An Officer may enter upon land at any reasonable time for the purpose of carrying out an inspection to determine whether or not the following are being complied with:

- (a) this By-law;
- (b) a direction or order made under the *Municipal Act, 2001* or this By-law.

(2) An Officer carrying out an inspection under subsection (1) may:

- (a) require the production for inspection of documents or things relevant to the inspection;
- (b) inspect and remove documents or things relevant to the inspection for the purpose of making copies or extracts; and
- (c) require information from any person concerning a matter related to the inspection.

(3) A receipt shall be provided for any document or thing removed under subsection (2) and the document or thing shall be promptly returned after the copies or extracts are made.

17 (1) If an Officer is satisfied that a contravention of this By-law has occurred, the Officer may make an order requiring the person who contravened the by-law, or who caused or permitted the contravention, or the owner or occupier of the land on which the contravention occurred to:

- (a) discontinue the contravening activity, or
- (b) do work to correct or prevent the contravention.

(2) An order made under subsection (1) shall set out:

- (a) reasonable particulars of the contravention adequate to identify the contravention and the location of the Land on which the contravention occurred; and
- (b) the date by which there must be compliance with the order.

Appendix "A" to Report PED16107(b)

Page 9 of 9

(3) An order under subsection (1) may require work to be done even though the facts which constitute the contravention of the by-law were present before the by-law making them a contravention came into force.

(4) An order issued under subsection (1) shall be served personally or by registered mail to the last known address on the person whom the Officer believes is contravening this By-law.

18 (1) Any person who contravenes an order under section 17 is guilty of an offence.

(2) If a person fails to comply with an order under section 17, the City may do the things required by the order at the person's expense.

(3) The City may recover the costs of doing any thing or matter under subsection (2) by action or by adding the costs to the tax roll and collected in like manner as taxes.

(4) The costs in subsection (3) shall include interest calculated at a rate of 15 per cent, calculated for the period commencing on the day the City incurs the costs and ending on the day the costs, including the interest, are paid in full.

(5) For the purposes of subsection (2), the City may enter upon land at any reasonable time.

REPEAL AND ENACTMENT

19 The City of Hamilton By-law No. 05-114 is hereby repealed in its entirety.

20 This By-law comes into force on the day it is passed.

PASSED this _____, 2019.

F. Eisenberger
Mayor

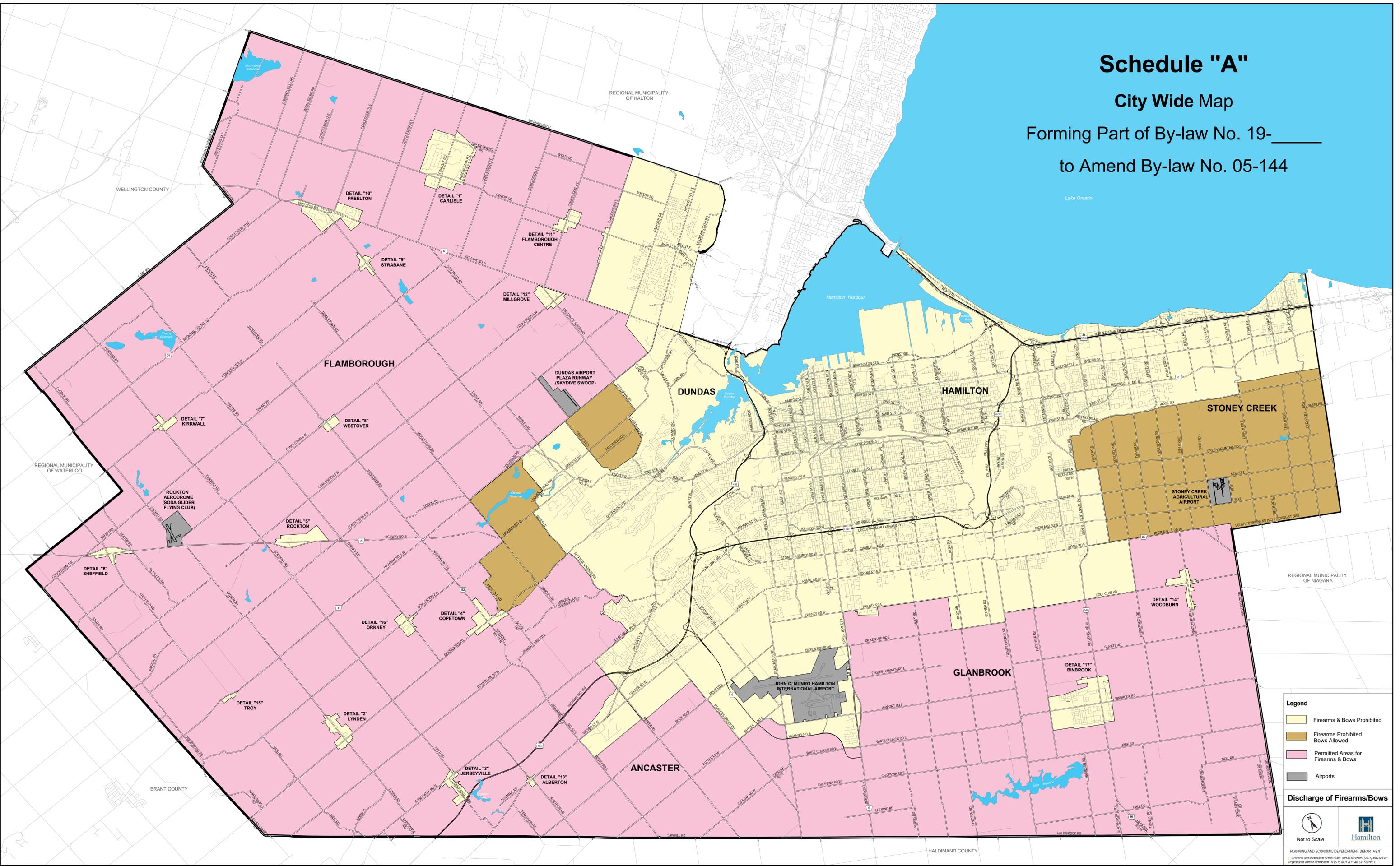
J. Pilon
Acting City Clerk

Schedule "A"

City Wide Map

Forming Part of By-law No. 19-_____

to Amend By-law No. 05-144



Legend

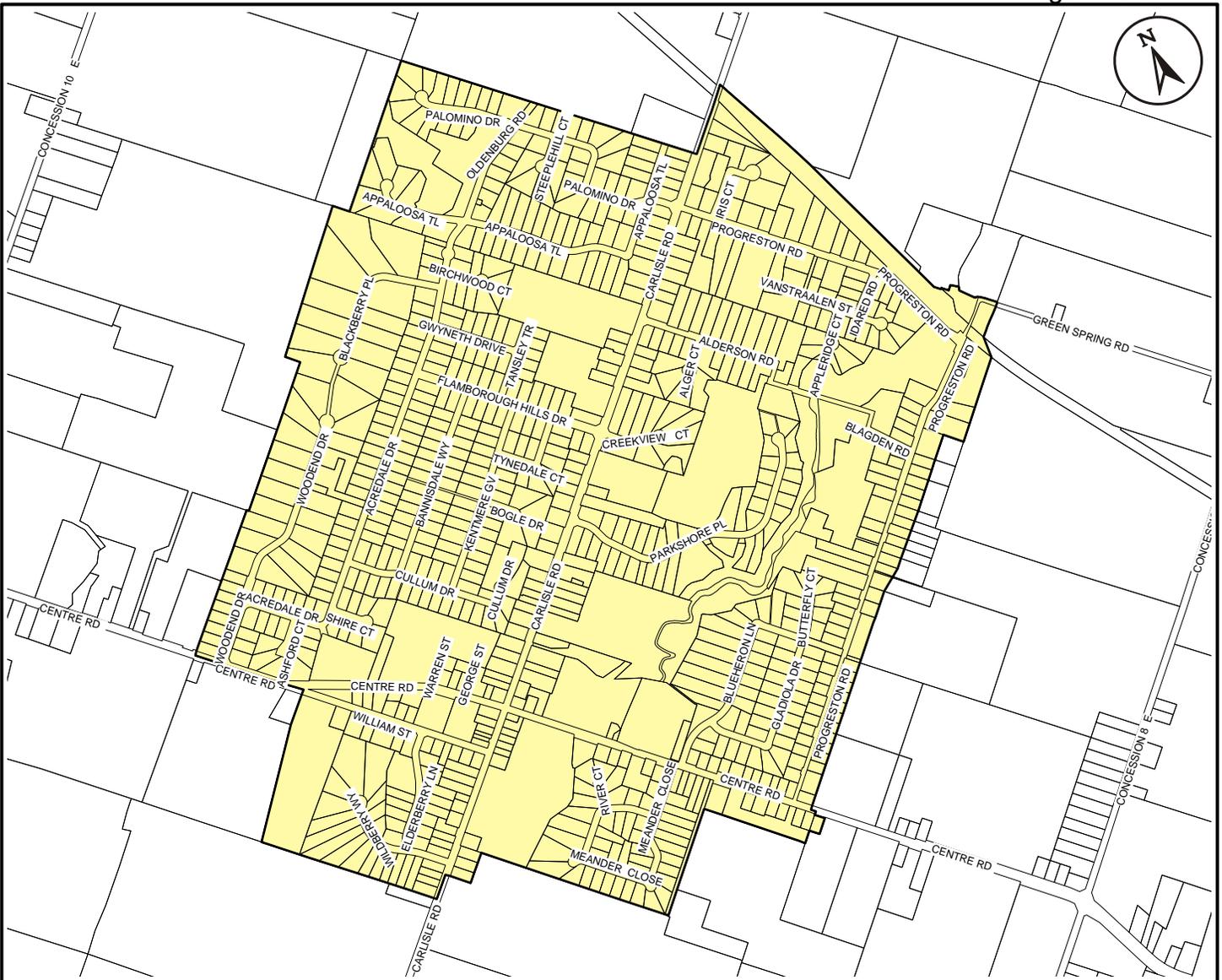
- Firearms & Bows Prohibited
- Firearms Prohibited Bows Allowed
- Permitted Areas for Firearms & Bows
- Airports

Discharge of Firearms/Bows

Not to Scale

Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
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This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 1 - Carlisle

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale:
N.T.S.

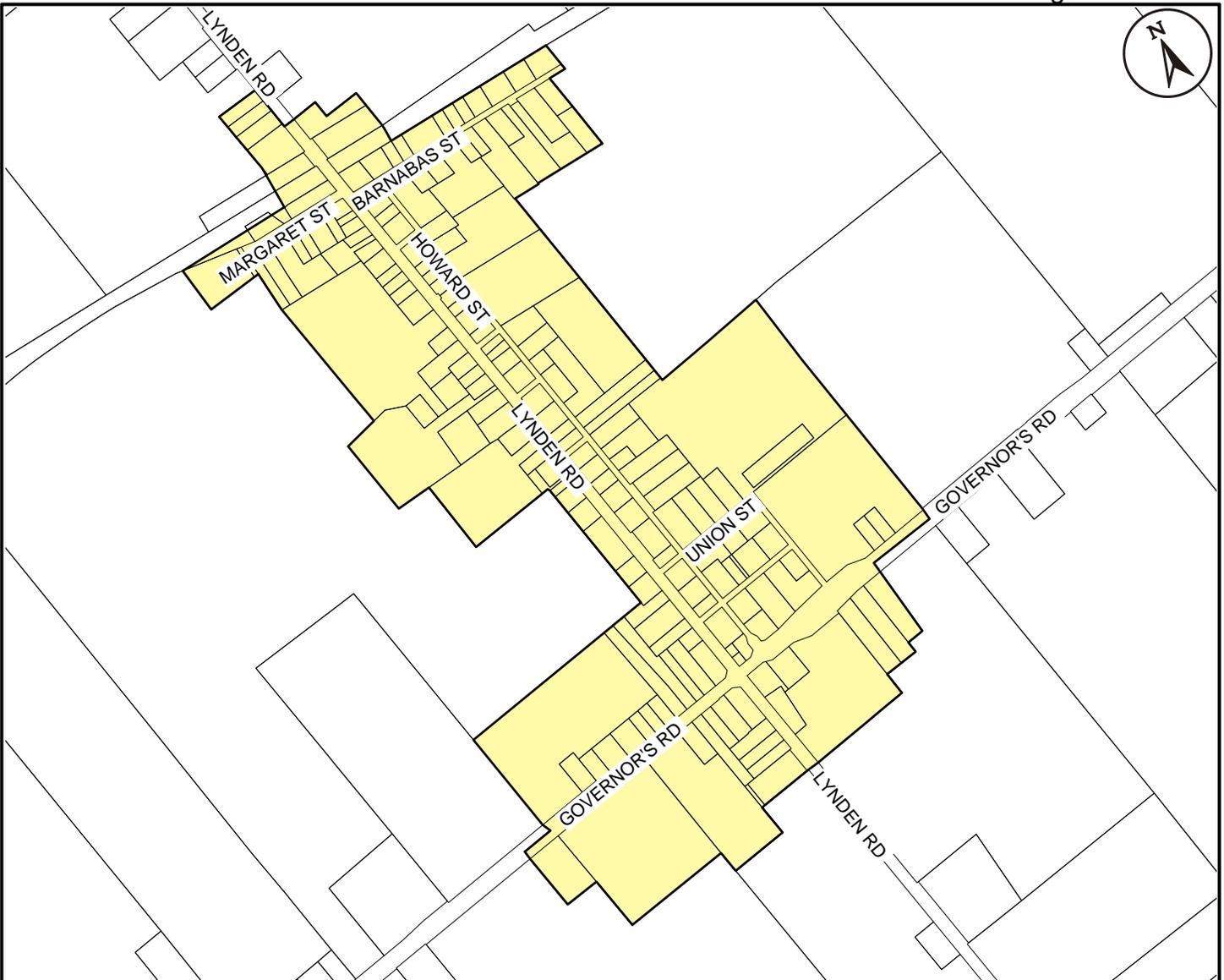
File Name/Number:
Detail 1 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 2 - Lynden

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale:
N.T.S.

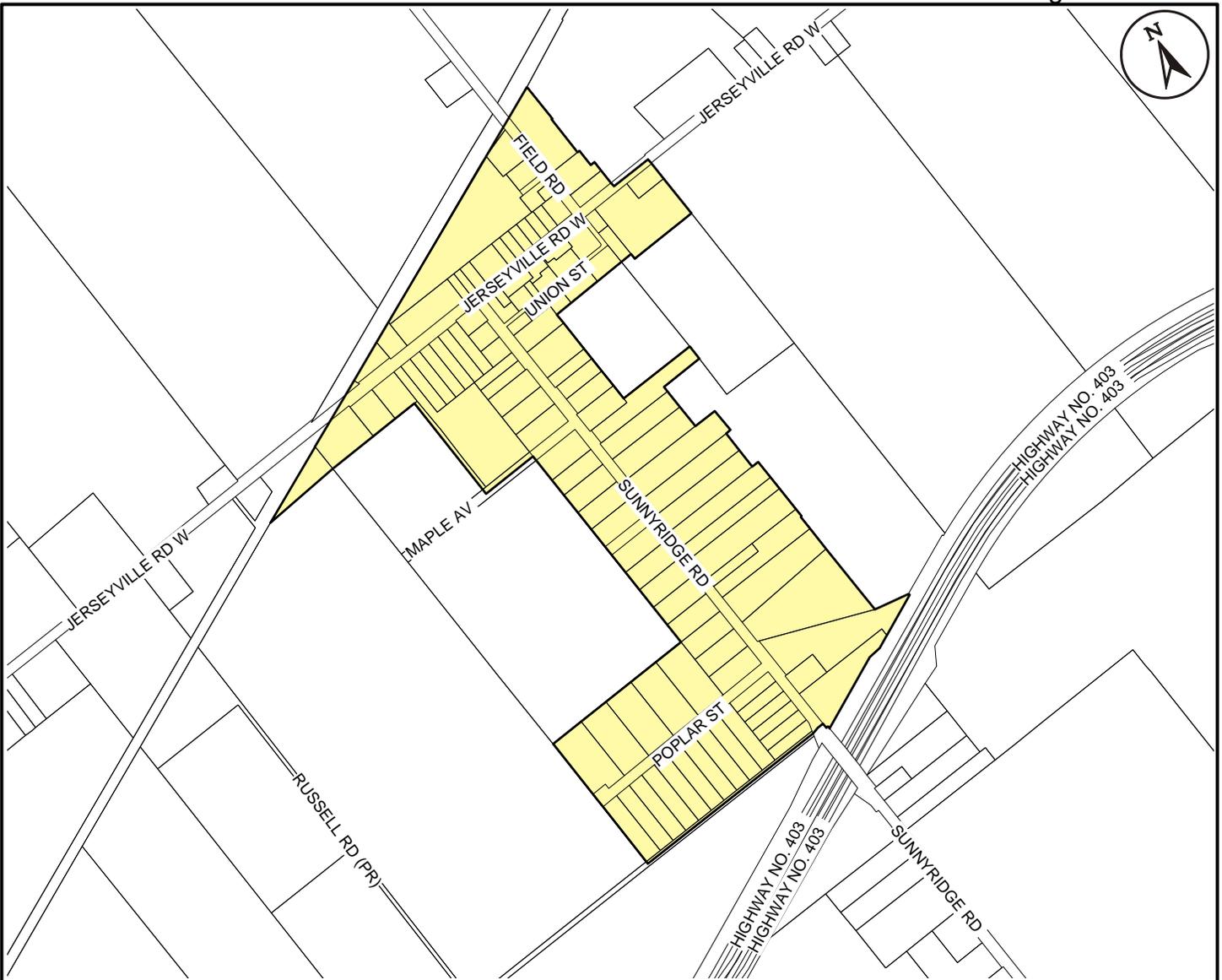
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Detail 2 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 3 - Jerseyville

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale:
N.T.S.

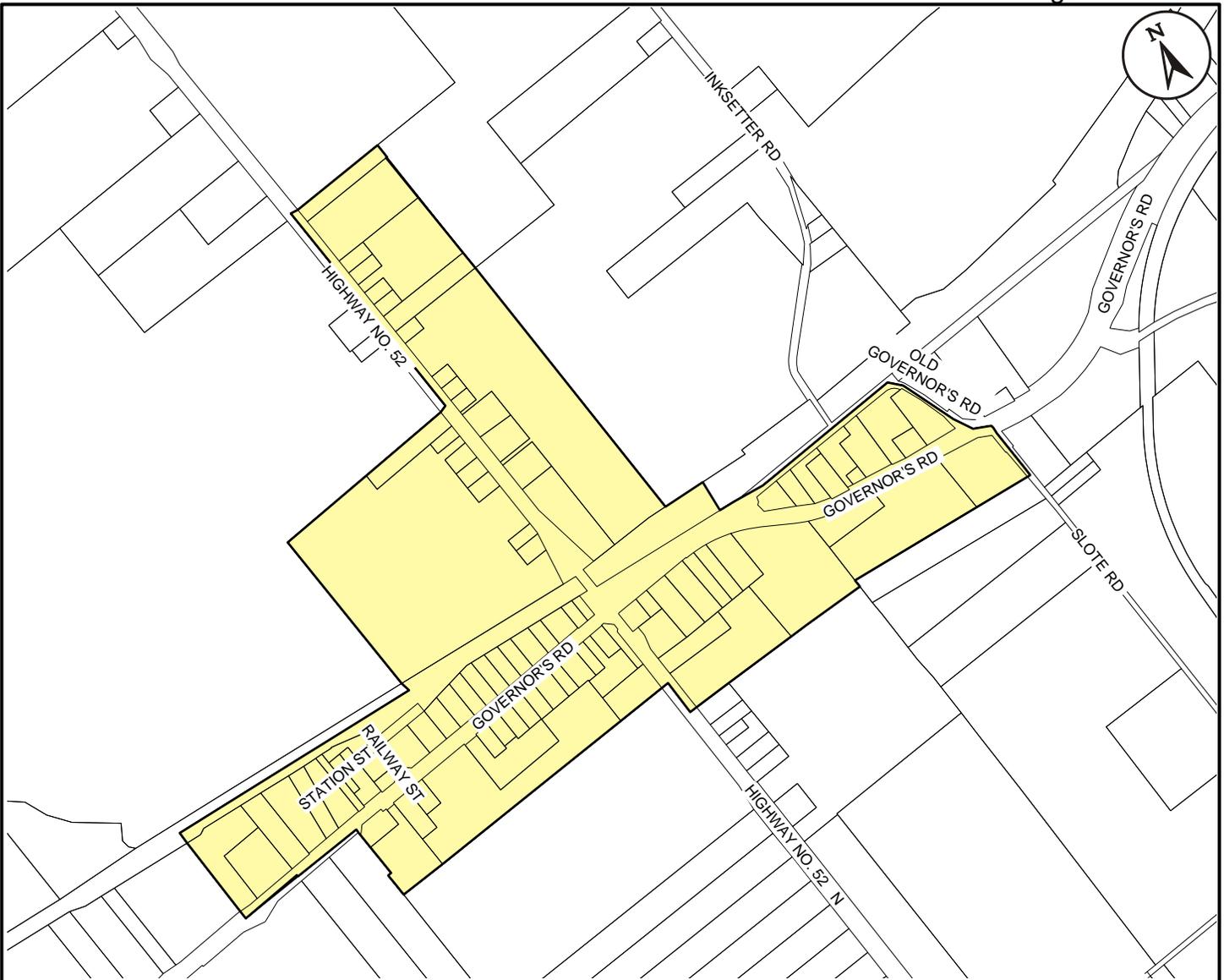
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Detail 3 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 4 - Copetown

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale:
N.T.S.

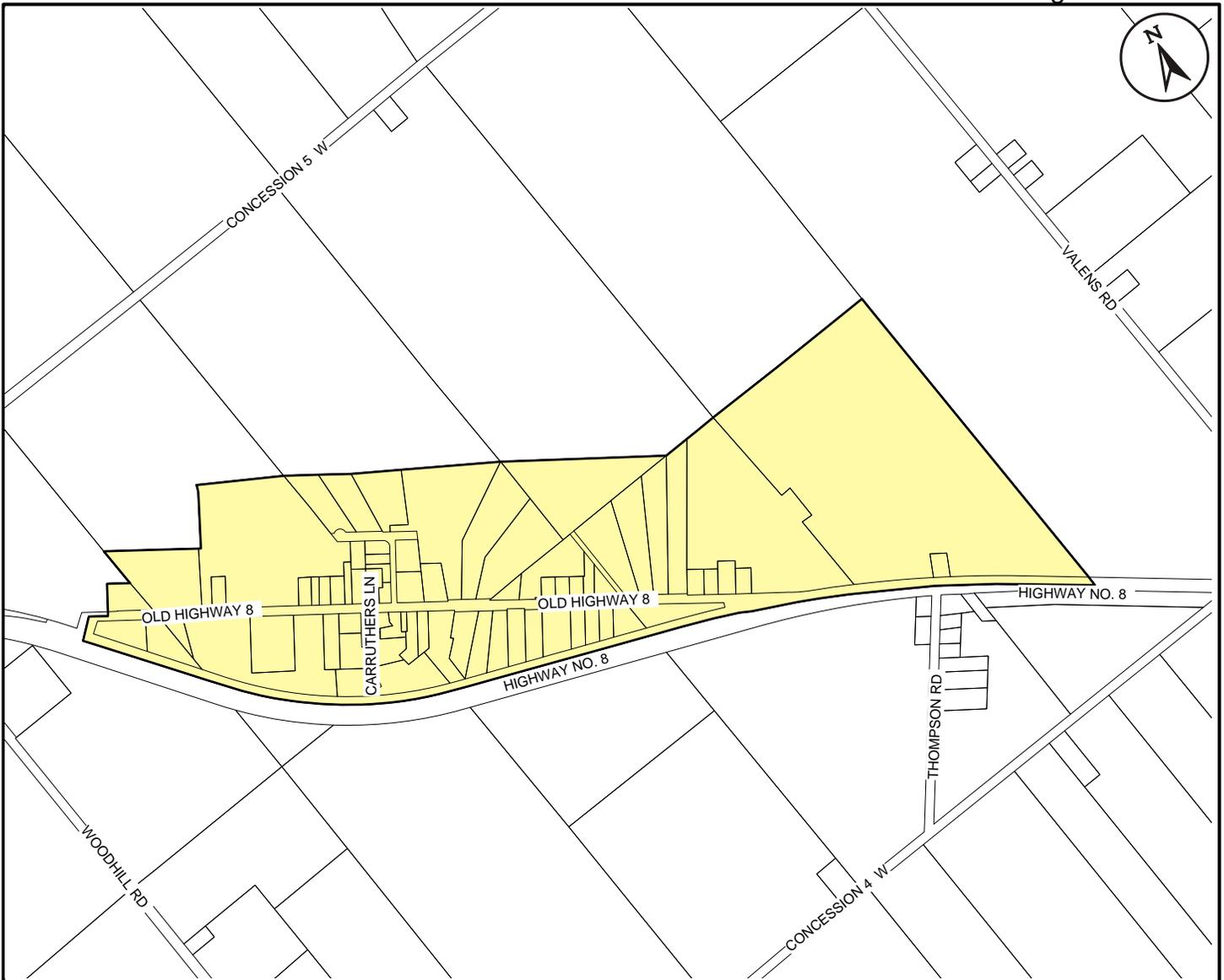
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Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

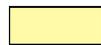
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 5 - Rockton



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

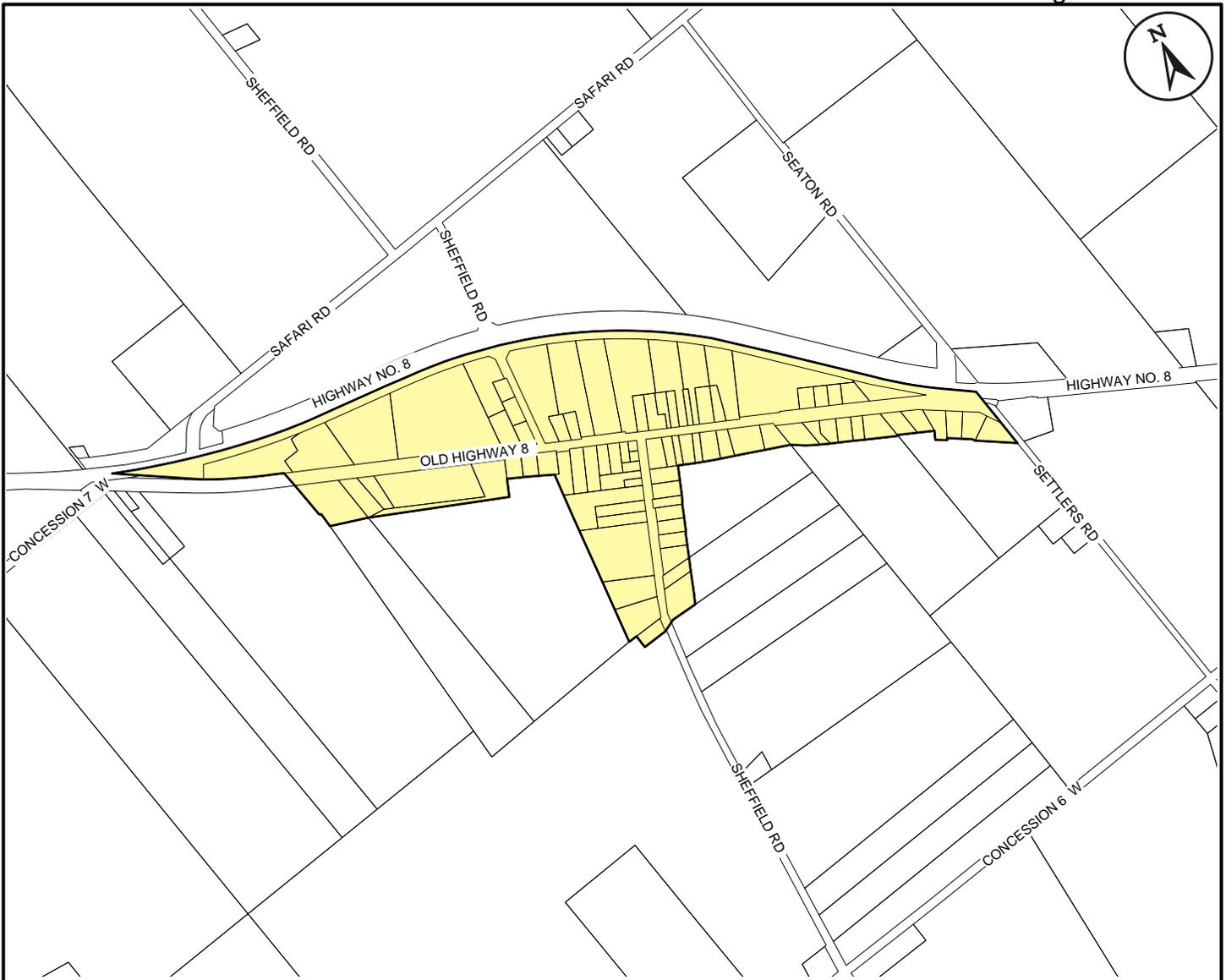
File Name/Number:
Detail 5 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

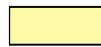
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 6 - Sheffield



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 6 to Schedule A & B

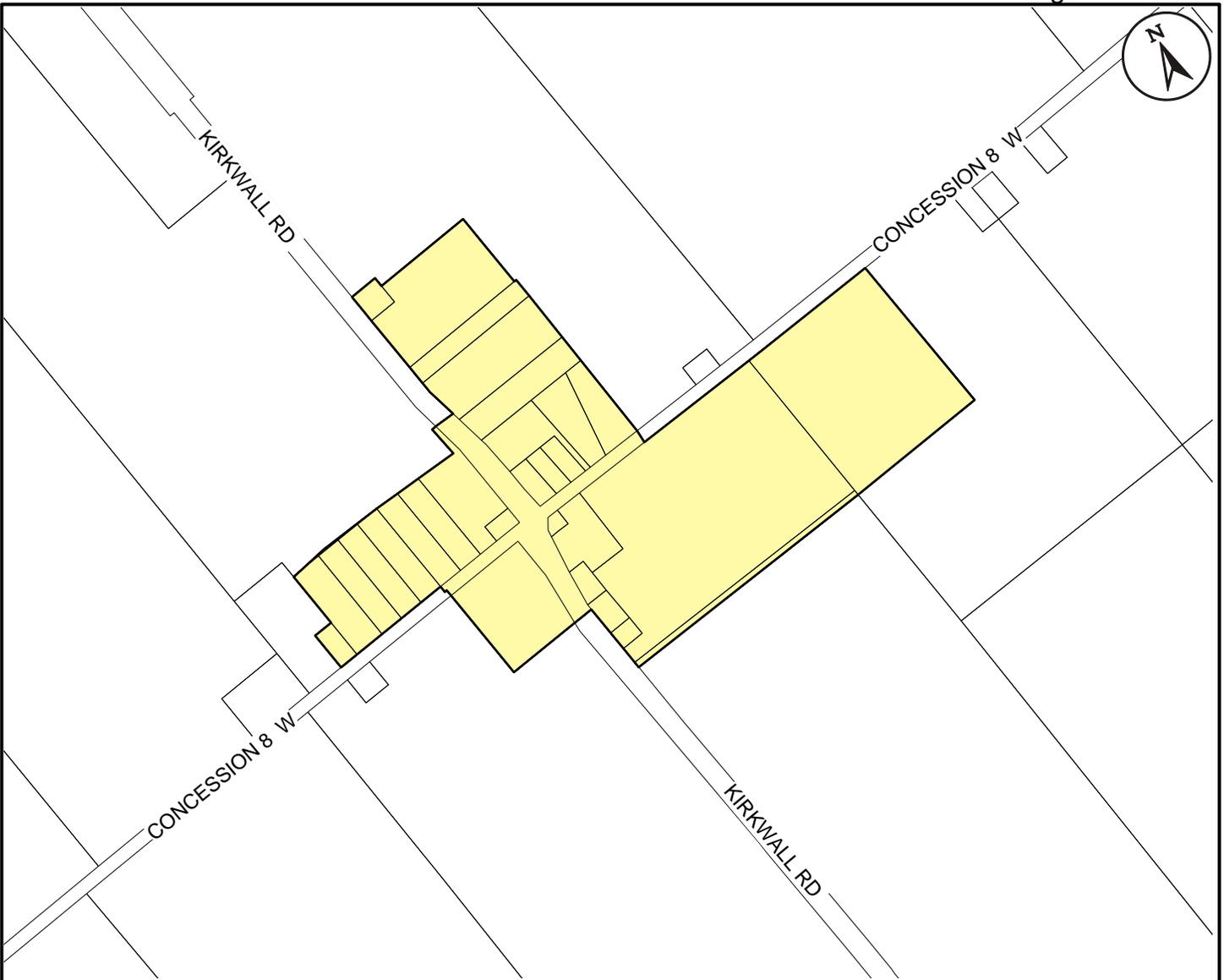
Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 7 - Kirkwall

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 7 to Schedule A & B

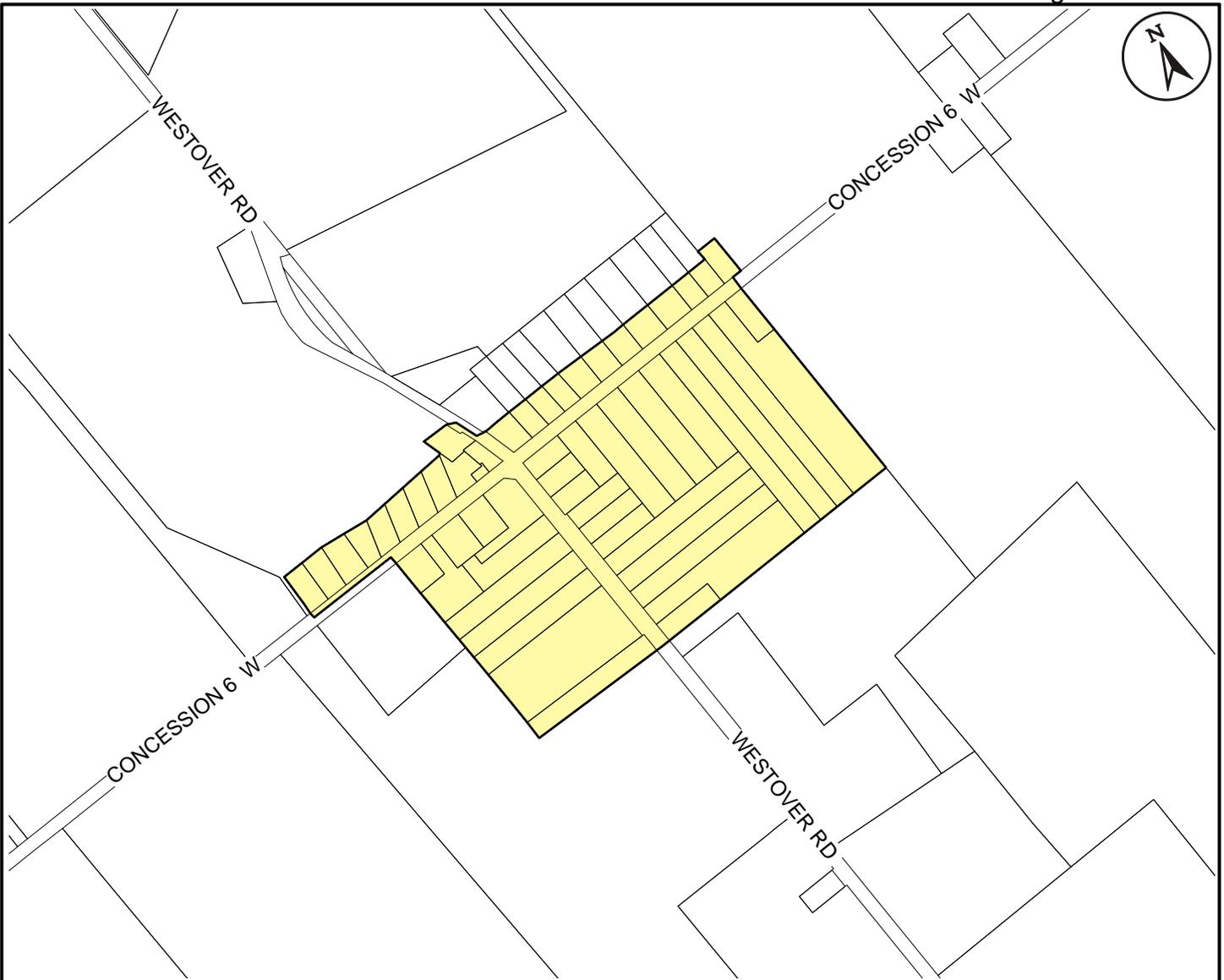
Date:
January 3, 2017

Planner/Technician:
RU/VS



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

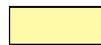
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 8 - Westover



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 8 to Schedule A & B

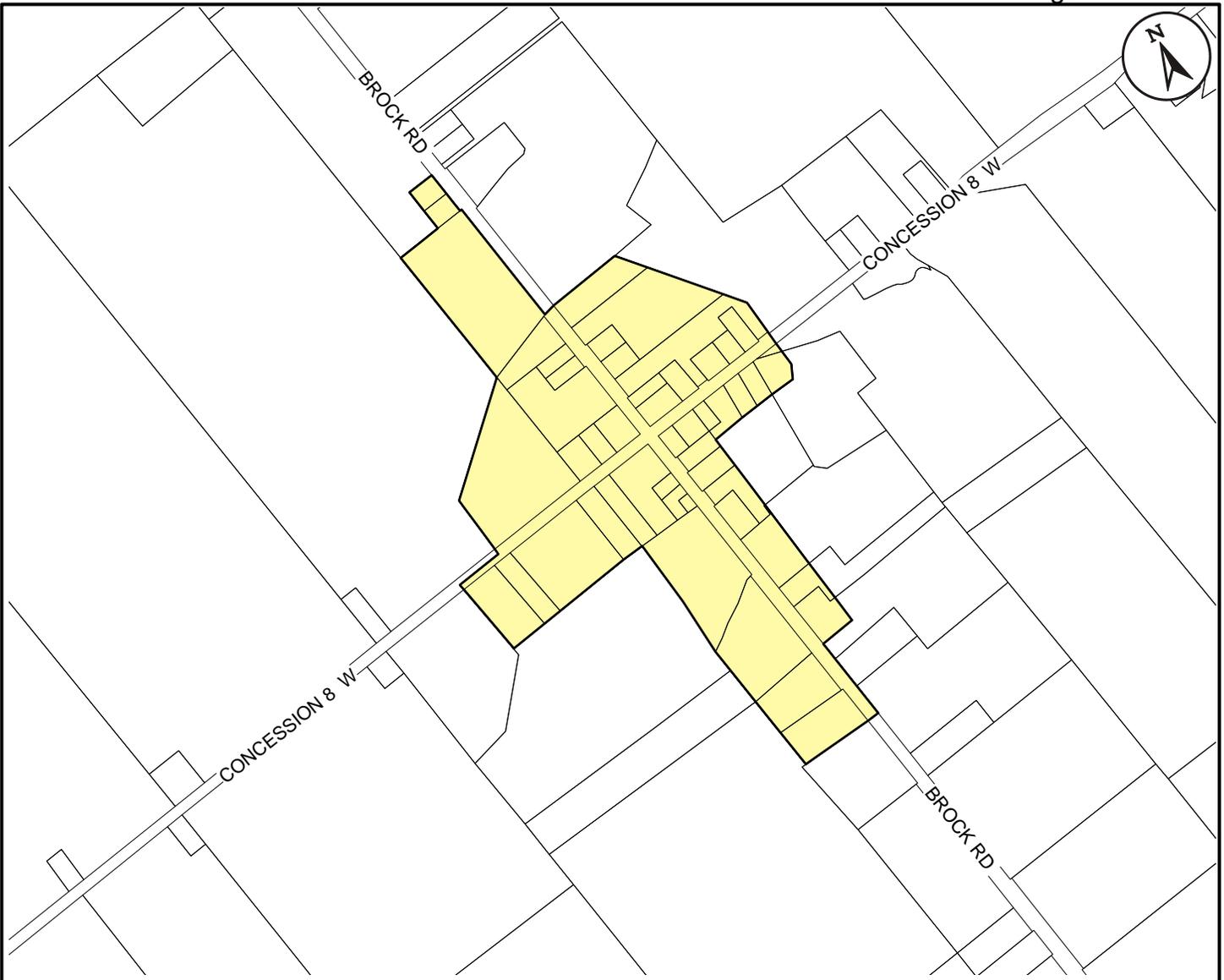
Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

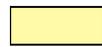
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 9 - Strabane



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 9 to Schedule A & B

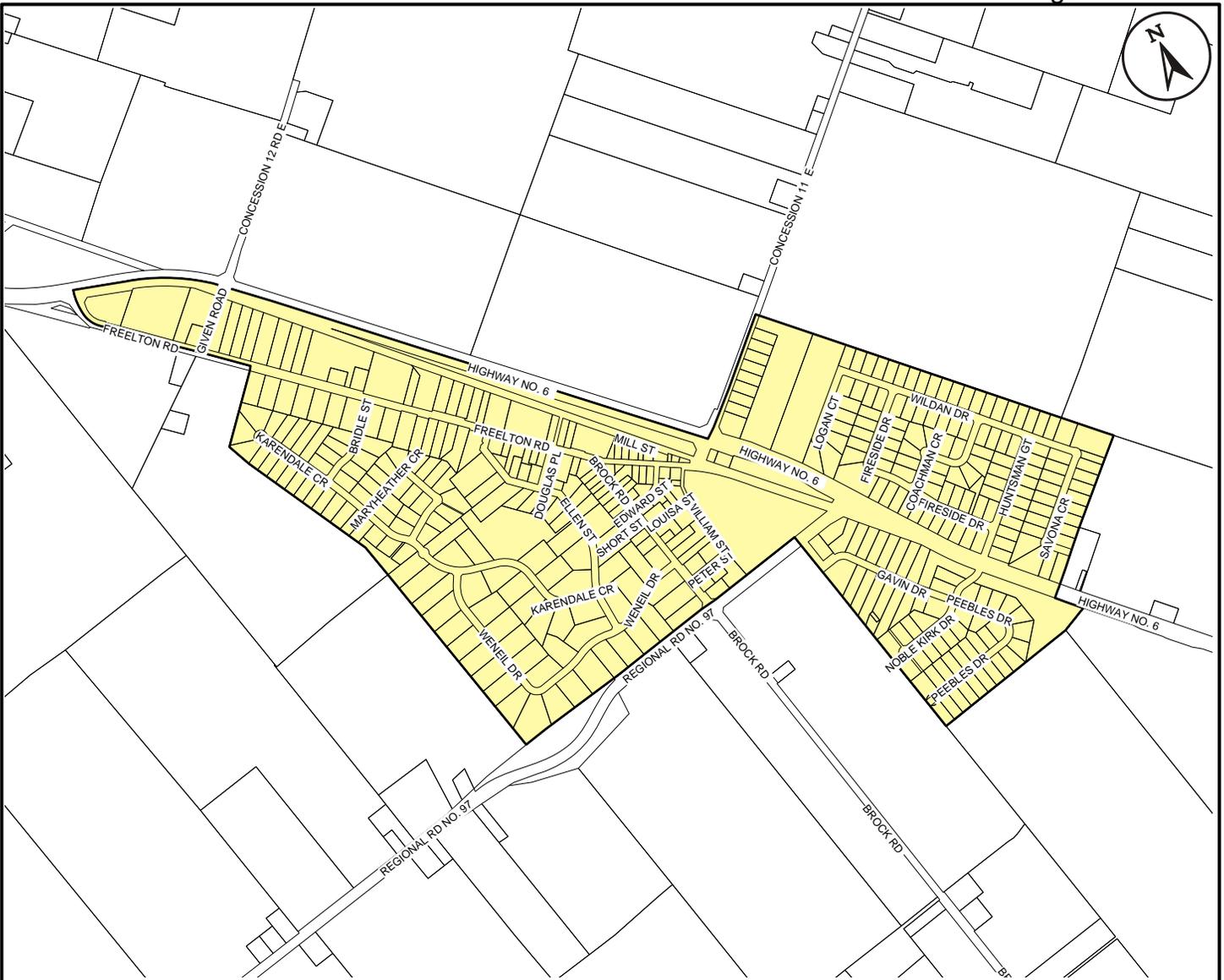
Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

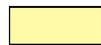
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 10 - Freelon



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 10 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 11 - Flamborough Centre

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale:
N.T.S.

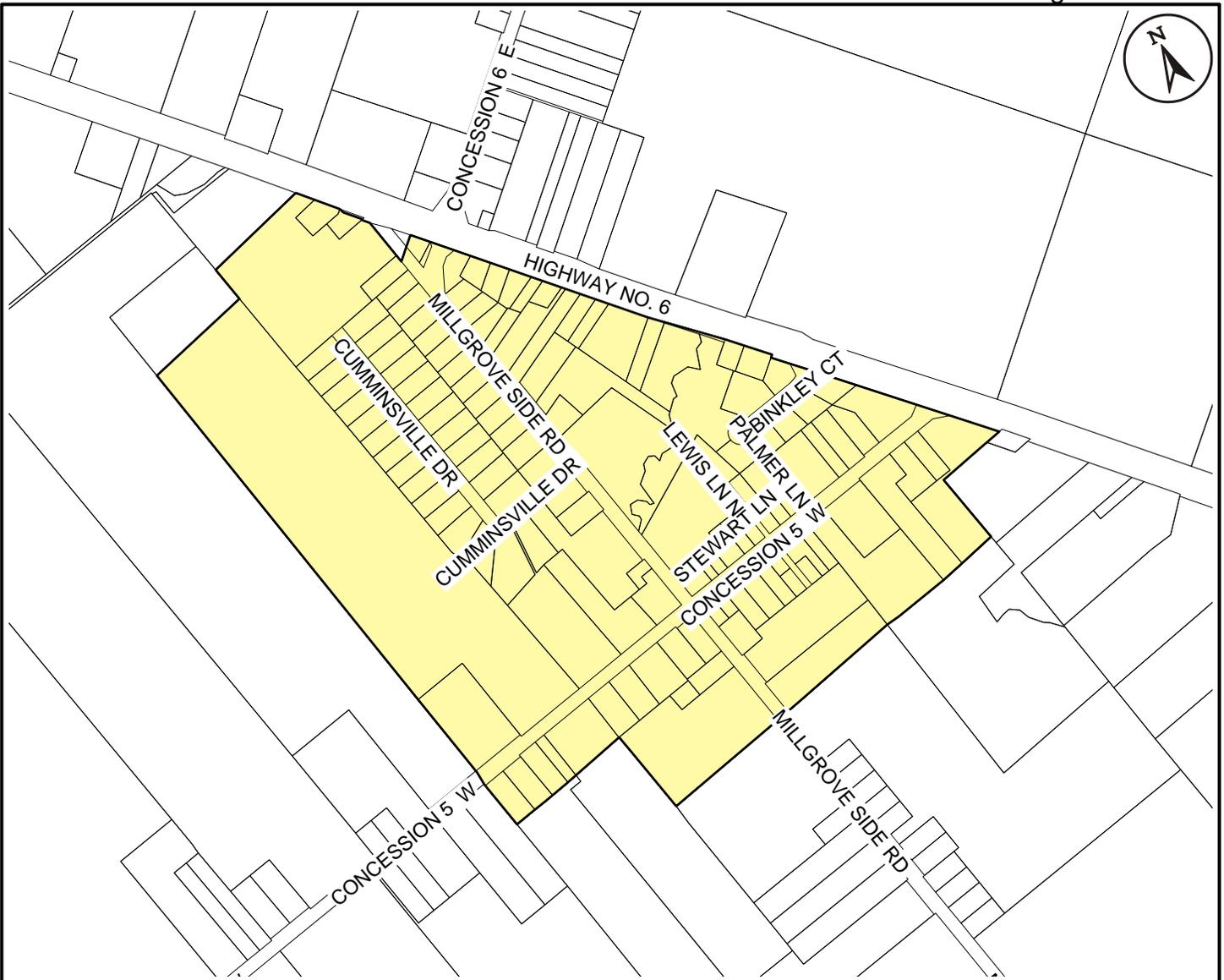
File Name/Number:
Detail 11 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

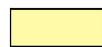
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 12 - Millgrove



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

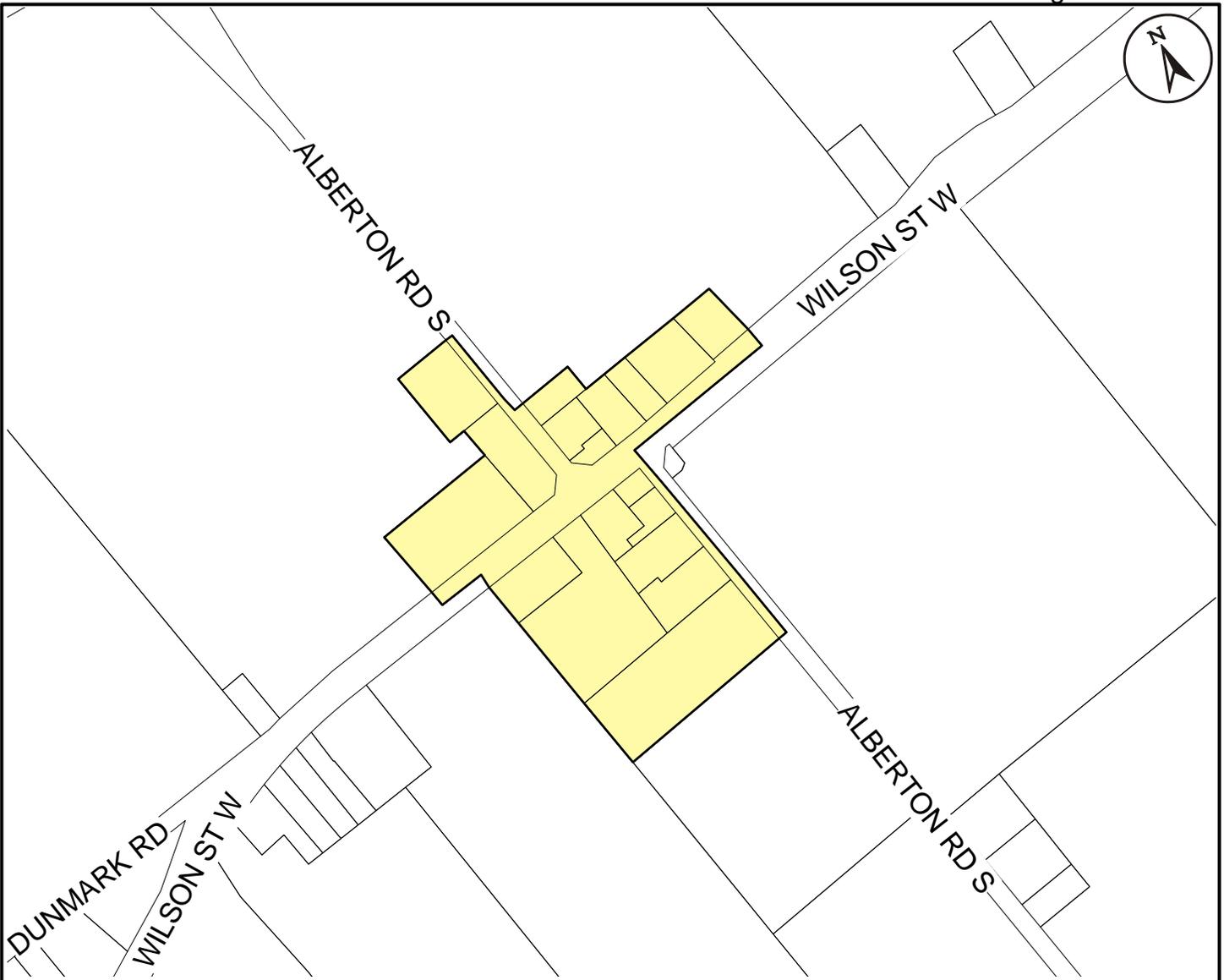
File Name/Number:
Detail 12 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-
 Passed the day of, 2019

 Mayor

 Clerk

Schedule "A"
 Map Forming Part of
 By-law No. 19-_____
 to Amend By-law No. 05-144

Subject Property
 Detail 13 - Alberton

 Firearms & Bows Prohibited
 Firearms & Bows Permitted

Scale:
 N.T.S.

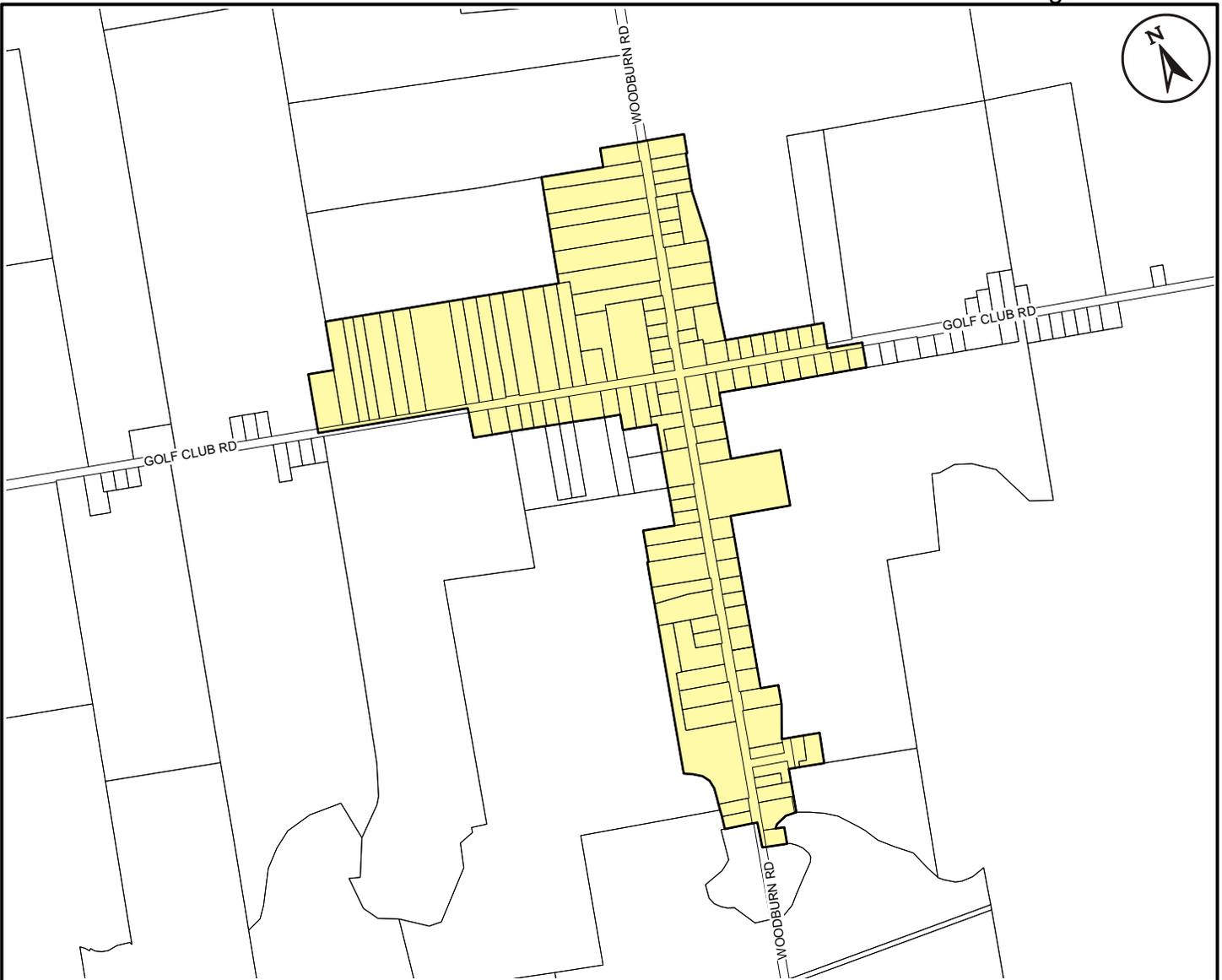
File Name/Number:
 Detail 13 to Schedule A & B

Date:
 July 12, 2018

Planner/Technician:
 RU/VS



PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

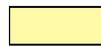
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 14 - Woodburn



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 14 to Schedule A & B

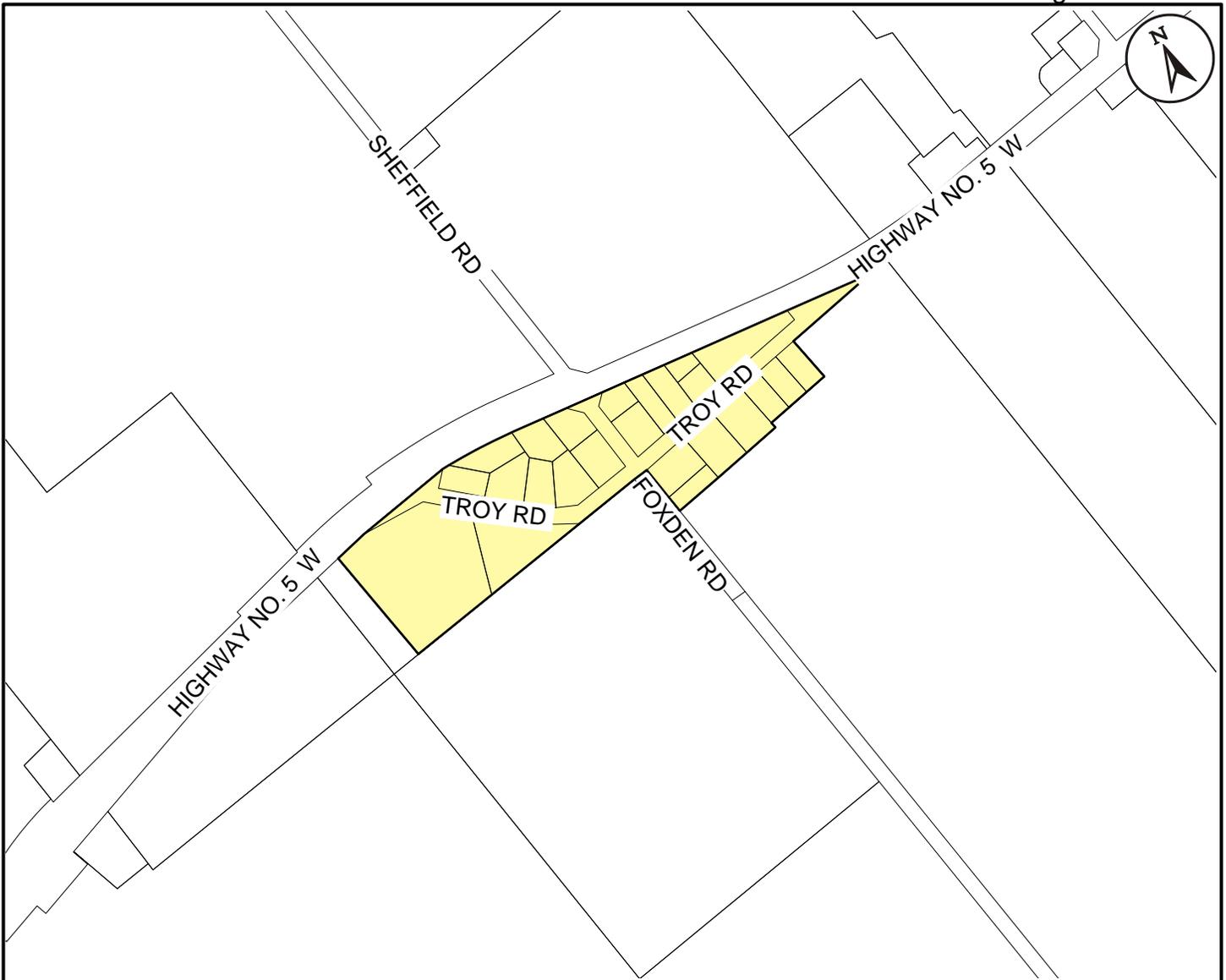
Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT



This is Schedule "A" to By-law No. 19-
 Passed the day of, 2019

 Mayor

 Clerk

Schedule "A"

 Map Forming Part of
 By-law No. 19-_____

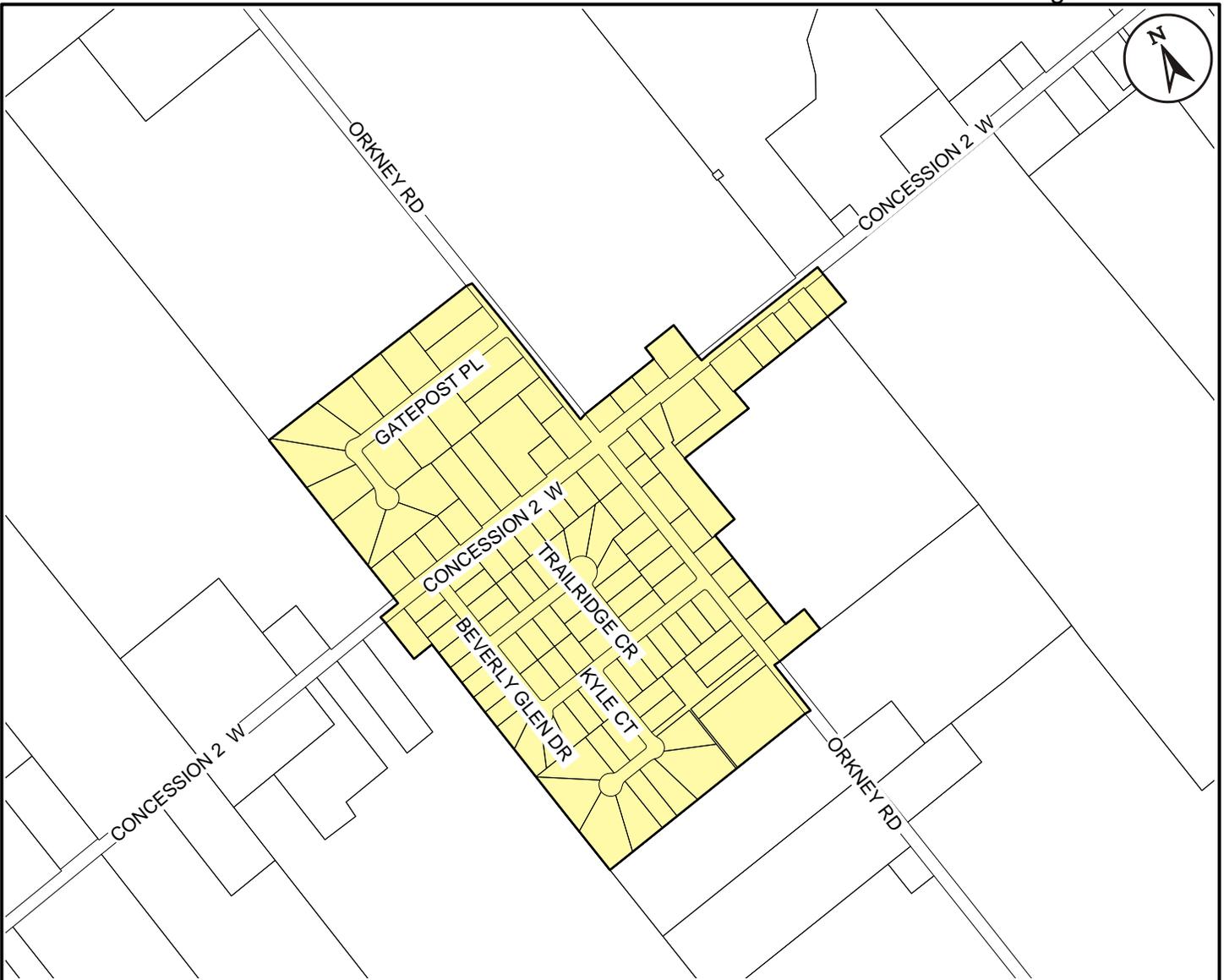
 to Amend By-law No. 05-144

Subject Property
 Detail 15 - Troy

- Firearms & Bows Prohibited
- Firearms & Bows Permitted

Scale: N.T.S.	File Name/Number: Detail 15 to Schedule A & B
Date: July 12, 2018	Planner/Technician: RU/VS





This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

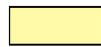
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No. 05-144

Subject Property

Detail 16 - Orkney



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

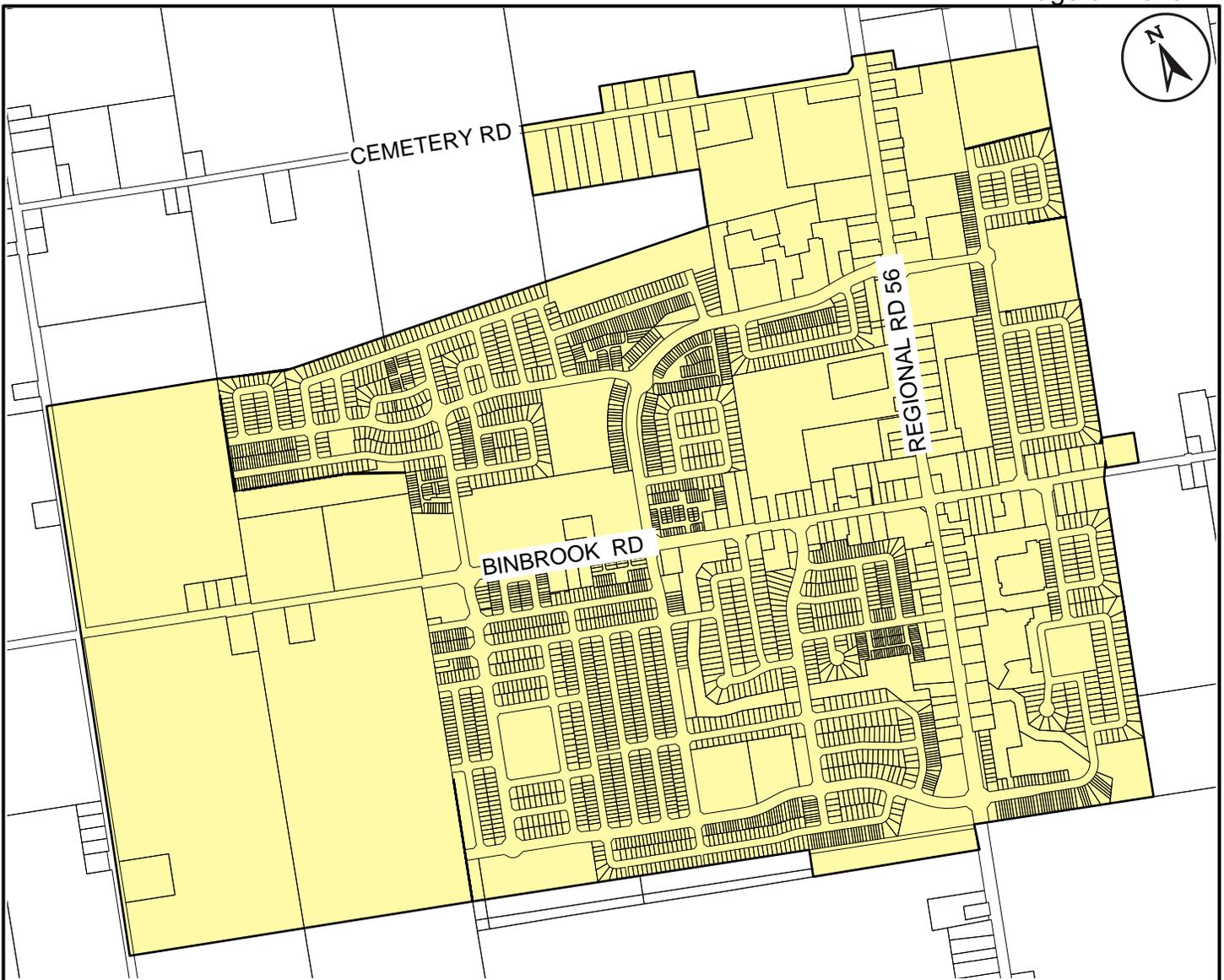
File Name/Number:
Detail 16 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton



This is Schedule "A" to By-law No. 19-

Passed the day of, 2019

Mayor

Clerk

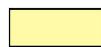
Schedule "A"

Map Forming Part of
By-law No. 19-_____

to Amend By-law No.

Subject Property

Detail 17 - Binbrook



Firearms & Bows Prohibited



Firearms & Bows Permitted

Scale:
N.T.S.

File Name/Number:
Detail 17 to Schedule A & B

Date:
July 12, 2018

Planner/Technician:
RU/VS



Hamilton

Authority: Item 11, Planning and Economic
Development Committee
Report 05-010 (PD05119)
CM: May 11,2005

Bill No. 114

CITY OF HAMILTON

BY-LAW NO. 05-114

Discharge of Firearms By-law

WHEREAS the City of Hamilton is the successor to the following former area municipalities: The Corporation of the Town of Ancaster; The Corporation of the Town of Dundas; The Corporation of the Town of Flamborough; The Corporation of the Township of Glanbrook; The Corporation of the City of Hamilton; and The Corporation of the City of Stoney Creek;

AND WHEREAS the City of Hamilton Act, 1999, provides that the By-laws of the former area municipalities continue in force in the City of Hamilton until subsequently amended or repealed by the Council of the City of Hamilton;

AND WHEREAS the Municipal Act, S.O. 2001, Chapter 25, as amended, section 119, authorizes a local municipality, for the purpose of public safety, to prohibit or regulate the discharge of guns or other firearms, air-guns, spring-guns, cross-bows, long-bows or any other firearm.

AND WHEREAS this By-law shall be referred to as the "Discharge of Firearms Bylaw".

NOW THEREFORE the Council of the City of Hamilton enacts as follows:

1. SHORT TITLE

This by-law may be cited as the "DISCHARGE OF FIREARMS BY-LAW".

2. DEFINITIONS

- (1) “**bow means**” a longbow, compound bow, re-curve bow, or any class thereof, or cross-bow
- (2) “**corporation**” means a corporation incorporated pursuant to the Business Corporations Act, R.S.O. 1990, as amended, the Corporations Act, R.S.O. 1990, as amended, or the Canada Business Corporations Act.
- (3) “**educational institution**” means any educational institution under the jurisdiction of the Ministry of Education or the Ministry of Colleges and Universities; a non-profit institution licensed or recognized by or under an Act of Parliament or the legislature of a province to provide pre-school, elementary, secondary or post-secondary education; and a non-profit institution that is directed or controlled by a board of education regulated by or under an Act of the legislature of a province and that provides continuing, professional or vocational education or training and includes an outdoor area when in use for instructional or recreational purposes by an education institution, whether or not adjacent to a building;
- (4) “**farm lands**” means lands that are:
 - (a) primarily and actively used for the raising of livestock and/or growing of produce; and
 - (b) a contiguous parcel of land having an area of no less than four (4) hectares and zoned agricultural; and
 - (c) identified as a “farm class” by the Farms Lands Property Class Tax Program administered by the Ontario Ministry of Agriculture and Food.
- (5) “**firearm**” or “**firearms**” means a barrelled weapon from which any shot, bullet or other projectile can be discharged and that is capable of causing serious bodily injury or death, and includes, air-guns, spring-guns, pellet gun or paint ball gun.
- (6) “**immediate danger**”, for the purposes of section 5, means a continuing and immediate danger posed by an animal to livestock, produce or property on farm lands or the fenced or penned area in which such livestock or produce may be located,
- (7) “**Law Enforcement Officer**” includes a police officer, a Provincial Offences Officer, a Municipal Law Enforcement Officer.

Page 3 of 7

- (8) **“livestock”** includes cattle, poultry, swine and other domesticated animals;
- (9) **“private park”** means a recreational area other than a public park and may include outdoor or indoor swimming pools, wading pools, snack bars, picnic areas, boating facilities, tennis courts, lawn bowling, gardens, or similar open spaces facilities, but excluding overnight camping areas.
- (10) **“produce and staple crops”** includes cultivated fresh fruits, vegetables, grains, rice and other consumable plants;
- (11) **“public park”** means a recreational area or any land, and land covered by water and all portions thereof owned by or made available by lease, agreement, or otherwise to the City of Hamilton, that is or hereafter may be established, dedicated, set apart or made available for use as a public open space or public golf course, and that has been or hereafter may be placed under the jurisdiction of the City of Hamilton including any and all buildings, structures, facilities, erections, and improvements located in or on such land or any other recreational area owned or controlled by the City of Hamilton or any board, or commission established under any statute of the province of Ontario.
- (12) **“religious institution or organization”** means an association that is (a) charitable according to the law of Ontario, (b) organized for the advancement of religion and for the conduct of religious worship, services or rites, and (c) permanently established both as to the continuity of its existence and as to its religious beliefs, rituals and practices;
- (13) **“Target Archery”** means indoor or outdoor archery organized for sport in which the participant uses a bow to discharge arrows at a target for practice or competition, but does not include forms of archery known as, field archery, ski archery, Clout archery, Flight archery, Popijay archery or Archery golf.

3. GENERAL PROHIBITIONS

- (1) No person shall discharge a firearm or bow within the limits of the City of Hamilton, except as provided for in Section 5
- (2) No owner or occupier of property shall permit the discharge of a firearm or bow on property to which they own or occupy, except as provided for in Section 5

Page 4 of 7

- (3) No person permitted under this By-Law to discharge a firearm or bow shall fail to ensure that projectile(s) discharged from the firearm or bow will not leave the property from where the discharge took place.
- (4) No person shall discharge a firearm or bow within one hundred (100) meters of a dwelling, a public park or private park, a public open space or the premises of an educational institution or of a religious institution or organization, including but not limited to any building, structures or grounds related thereto.
- (5) No person shall obstruct a Law Enforcement Officer while such Law Enforcement Officer is engaged in his or her duties under this By-Law.

4. SCOPE

This By-Law does not apply to:

- (a) lands which are a federally regulated national defence establishment as defined by the National Defence Act; and
- (b) any duly authorized Law Enforcement Officer exercising the authorities found within the Fish and Wildlife Conservation Act S.O. 1997, CHAPTER 41 or engaged in the performance of his or her duties including, any training exercises.
- (c) Target Archery the location and use of which is lawful with applicable zoning and building requirements and any other applicable federal, provincial and municipal laws.

5. EXEMPTIONS

(1) Subsections 3.(1) and 3.(2) of this By-law do not apply to:

- (a) a person discharging a firearm who holds all hunting and firearms licences required by law providing that the discharge occurs in the areas indicated on the map attached as Schedule 'A'; attached hereto, which Schedules form part of this By-law.
- (b) a person discharging a bow who holds all hunting and firearms licences required by law providing that the discharge occurs in the areas indicated on the map attached as Schedule 'B'; attached hereto, which Schedules form part of this By-law.

Page 5 of 7

- (c) a federally regulated and licensed rifle range, gun shop, firearms dealer or gun club, the use and location of which is lawful with applicable zoning and building requirements and any other applicable federal, provincial and municipal laws
- (d) a person discharging a firearm or bow or permitting the discharge of a firearm or bow on the lands indicated on Schedule "A" and on Schedule "B" attached hereto provided that such person is the lawful owner or occupier of such lands or such person has been expressly authorized by the lawful owner or occupier to do so and provide that such person complies with subsection 5(a) and (b).

(2) Subsections 3.(1), 3.(2) and 3(4) of this By-law do not apply to:

- (a) the discharge of a firearm by an individual while on his or her own farm lands, provided that the property comprises a contiguous parcel of land having an area of four (4) hectares or more and is zoned agricultural and that the purpose of the discharge is to protect livestock or produce from the immediate danger of attack from animals;
 - (i) In the event that the farm lands are owned by a corporation, representatives of the corporation authorized under this subsection shall be entitled to the exemption provided by this subsection. The corporation may designate authorized representatives, at any time, for the purpose of this subsection provided that the authorized representative complies with subsection 6(1)
- (3) Any person who is the Event Organizer undertaking a military re-enactment exercise or practice shall as part of the Special Event, apply in writing to the City of Hamilton for an exemption from sections 3(1) and 3(2) and sections 5(1)(a) and 5(1)(b), with respect to public parks or public open space or specified area thereof, of this By-law, provided that the safety measures for such exercise and all other requirements, including but not limited to insurance and indemnification for loss, injury or damages, which may be imposed by the City of Hamilton are to the satisfaction of the City of Hamilton's Special Events Advisory Team.
- (4) An individual while on his or her own land may apply in writing to the Building and Licensing Division of the City of Hamilton for an exemption from

Page 6 of 7

subsection 3(1). Applications for an exemption pursuant to this section must receive Council approval. Council in its discretion, after considering the report from Committee may grant, modify or refuse to approve the application.

- (5) An application made pursuant to section 5(4) must indicate the following:
- (i) that the discharge of a firearm or bow is for the purpose of hunting by the individual while on his or her own land, and
 - (ii) that a survey plan, has been submitted indicating the municipal address, geographical location and layout of where the hunting is to take place and the portion of the surrounding area that could be affected by the discharge of the firearm or bow, and
 - (iii) that the property comprises a contiguous parcel of land having an area of four **(4)** hectares or more and is zoned agricultural, and
 - (iv) whether a firearm or bow or both will be used.
- (6) Exemptions granted pursuant to section 5(4) are subject to a one (1) year limitation, after which time the exemption is revoked.

6. REGULATIONS

- (1) Notwithstanding subsection 5, no person, where such person is not the lawful owner or occupier of the lands upon which the person carries a firearm or bow, shall fail to have in their possession and be able to produce, upon request of a Law Enforcement Officer, the current name address and phone number of the lawful owner or occupier of the said lands or legal representative giving such person the permission to discharge a firearm or bow.

7. ENFORCEMENT

- (1) Any person who contravenes any provision of this By-Law is, upon conviction, guilty of an offence and is liable to any penalty as provided by the Provincial Offences Act.
- (2) The Court in which the conviction has been entered, and any court of competent jurisdiction thereafter, may make an order prohibiting the continuation or repetition of the offence by the person convicted, and such order shall be in addition to any other penalty imposed on the person convicted.

8. REPEAL

The following By-Laws:

The Corporation of the Town of Ancaster By-Law No. 76- 29 and By-Law No. 89-115;

The Corporation of the Town of Dundas By-Law No. 2792-75;

The Township of Flamborough By-Law No. 81-93-F, as amended by By-Law No. 90-13-F and By-Law No. 96-48-F;

The Corporation of the Township Of Glanbrook By-Law No. 55-74, as amended by By-Law No. 55-1-93 and by-law No. 222-80 as amended;

The Corporation of the City of Hamilton By-Law No. 8567; and

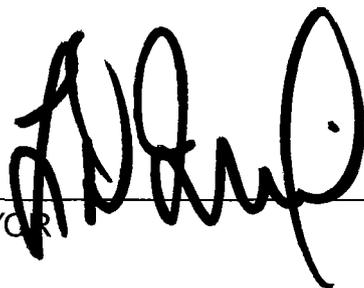
The Corporation of the Town of Stoney Creek By-Law No. 92-74, as amended by By-Law No. 187-75, By-Law No. 1253-82 and By-Law No. 394 1-94

shall be and the same are hereby repealed.

9. ENACTMENT

This By-Law shall come into force on the day it is passed.

PASSED and ENACTED this 11th day of May, 2005.



MAYOR



CLERK

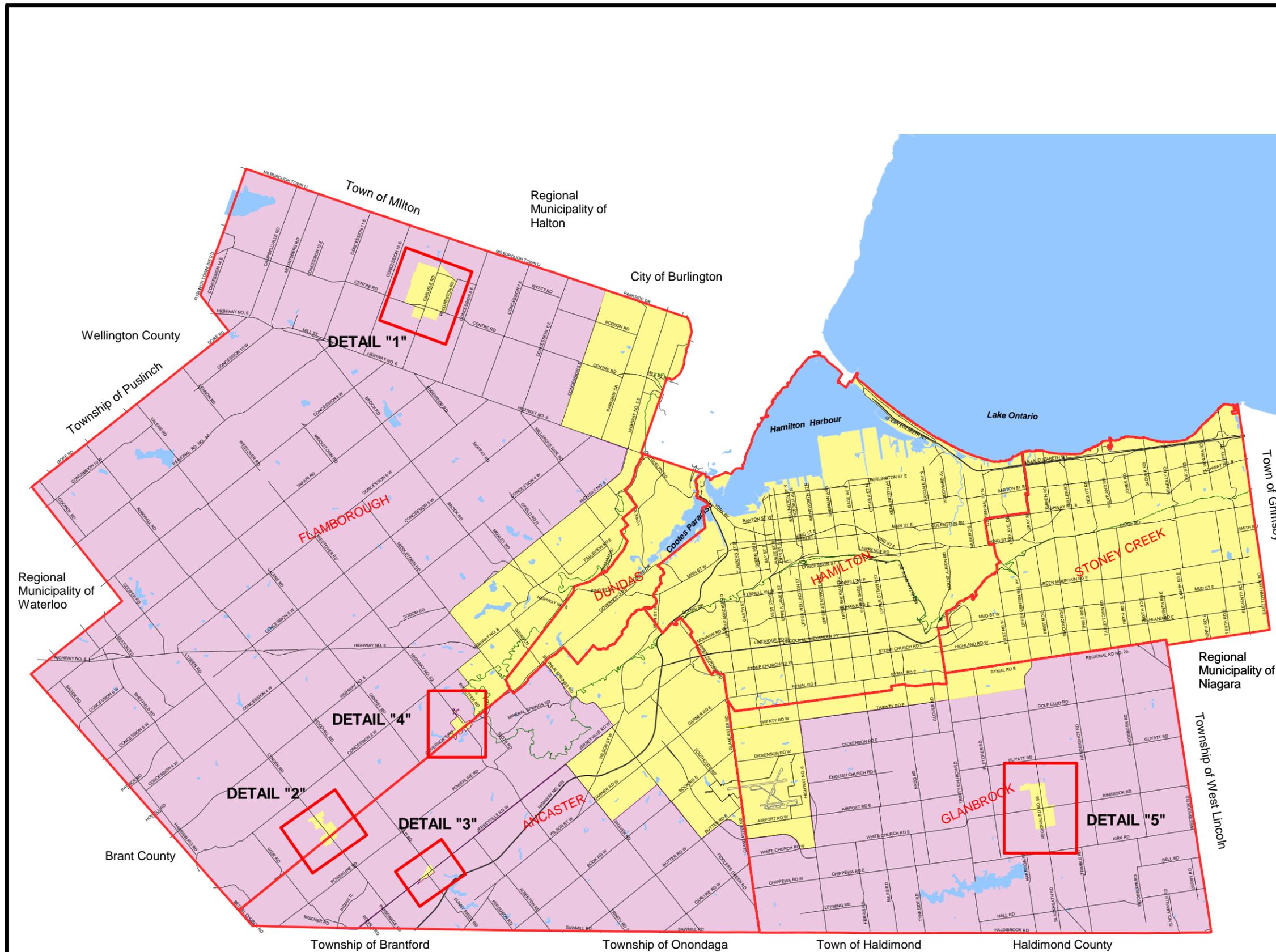


Hamilton

City of Hamilton

SCHEDULE 'A'

Discharge of Firearms Area



LEGEND

- DISCHARGE OF FIREARM PERMITTED
- AREA SUBJECT TO SECTION 3(1) OF THIS BY-LAW



NORTH
 SCALE N.T.S.

APRIL 2005

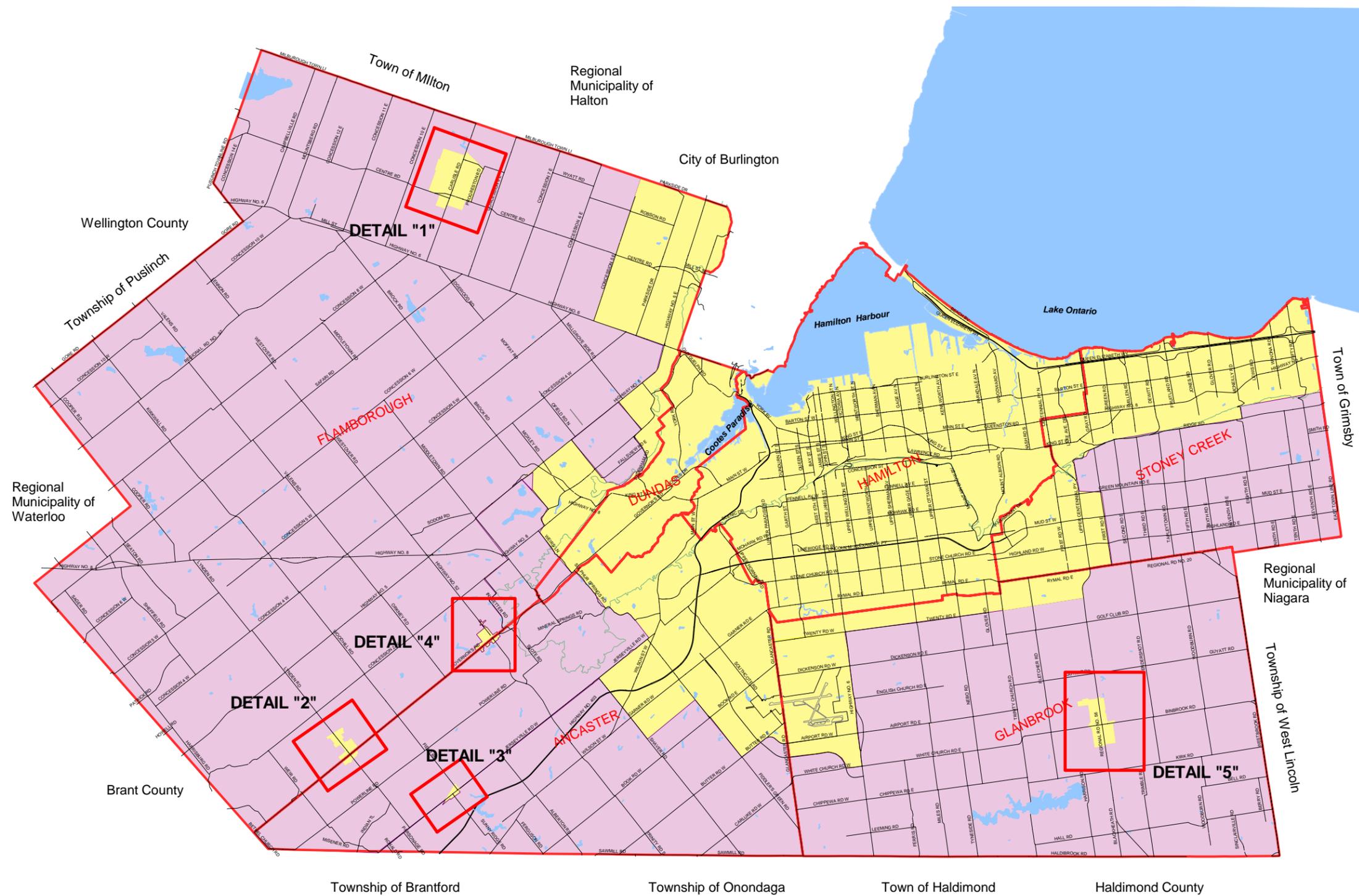


Hamilton

City of Hamilton

SCHEDULE 'B'

Discharge of Bow Area



LEGEND

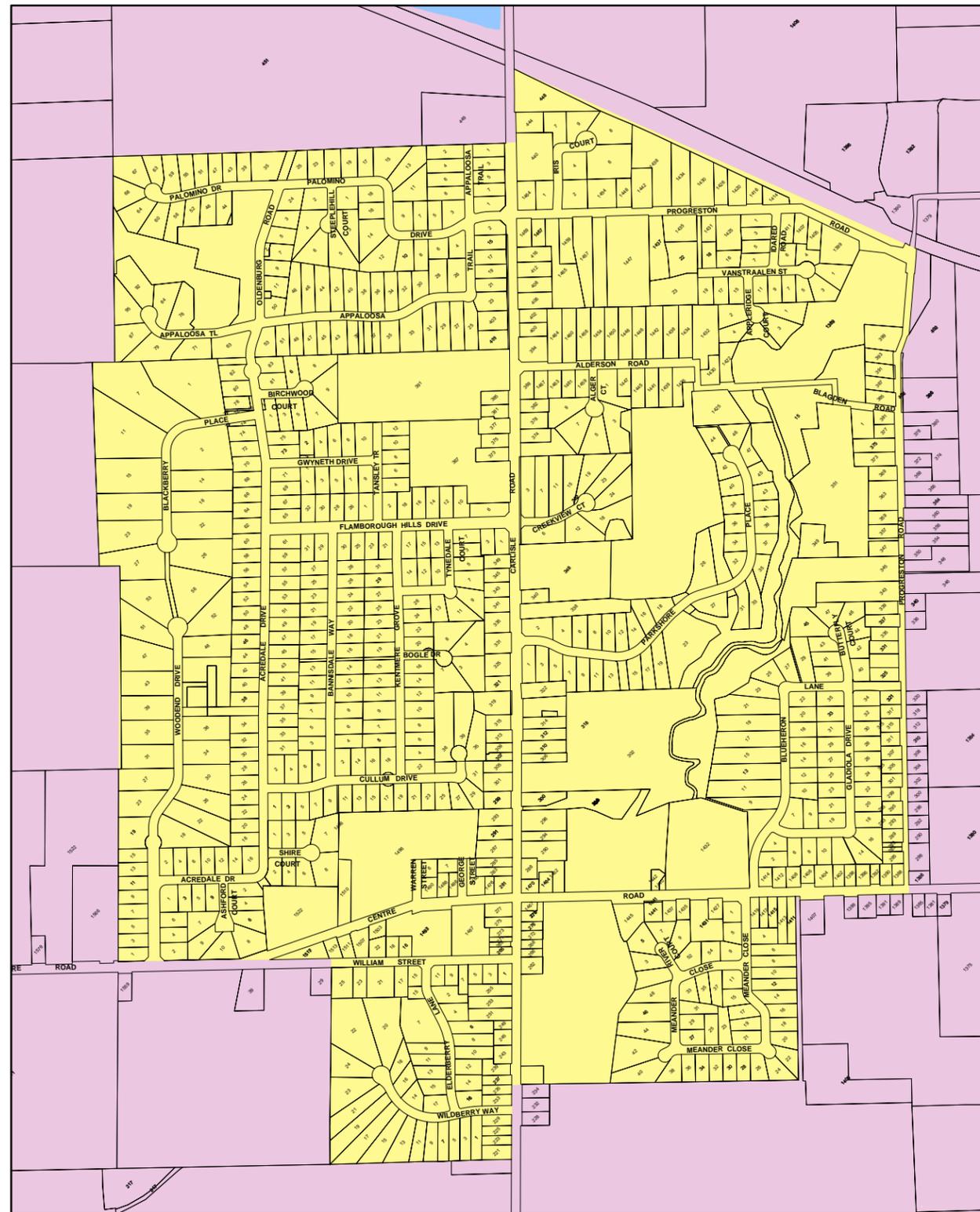
- DISCHARGE OF FIREARM PERMITTED
- AREA SUBJECT TO SECTION 3(1) OF THIS BY-LAW



NORTH
 SCALE N.T.S.

APRIL 2005

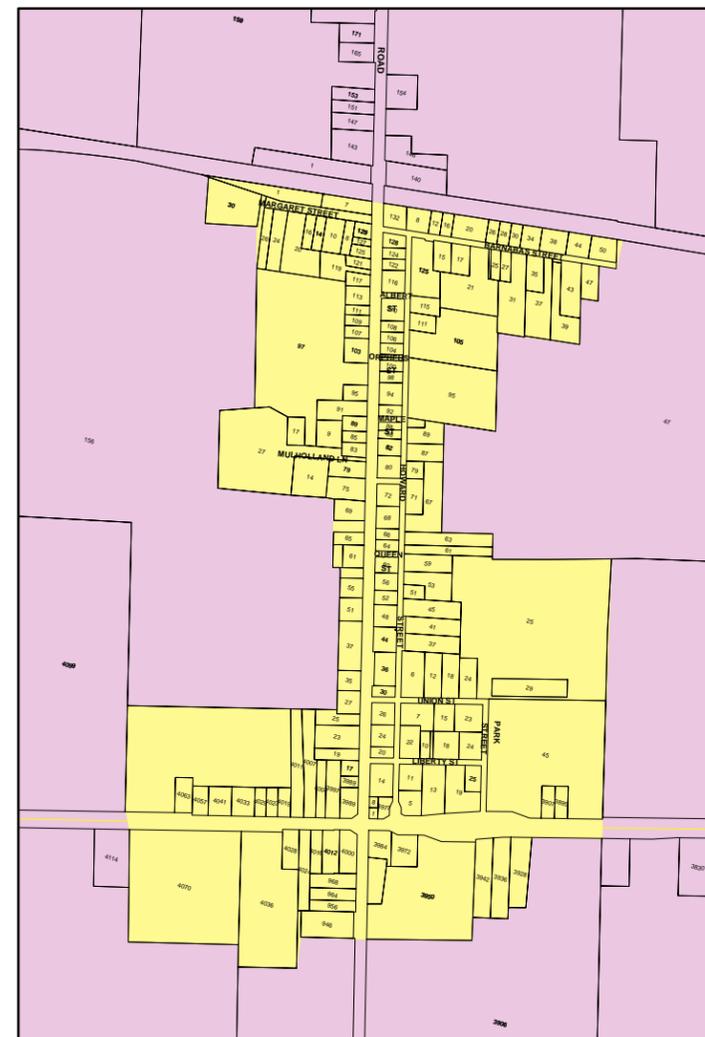
DETAIL 1 TO SCHEDULE A AND SCHEDULE B



SCALE 1:12500



DETAIL 2 TO SCHEDULE A AND SCHEDULE B



SCALE 1:12500



Hamilton
 City of Hamilton

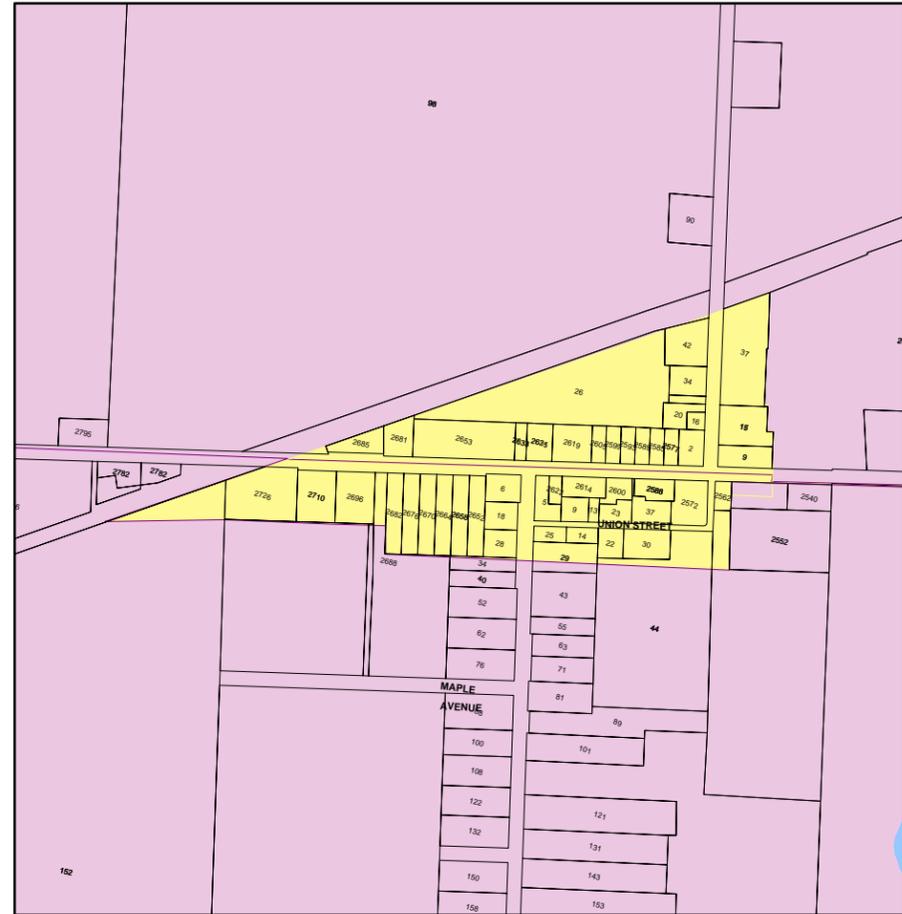
SCHEDULE 'A' Details 1 & 2

**Details Discharge of
 Firearms and Bows Areas**

LEGEND

- DISCHARGE OF FIREARM AND BOWS PERMITTED
- AREA SUBJECT TO SECTION 3(1) OF THIS BY-LAW

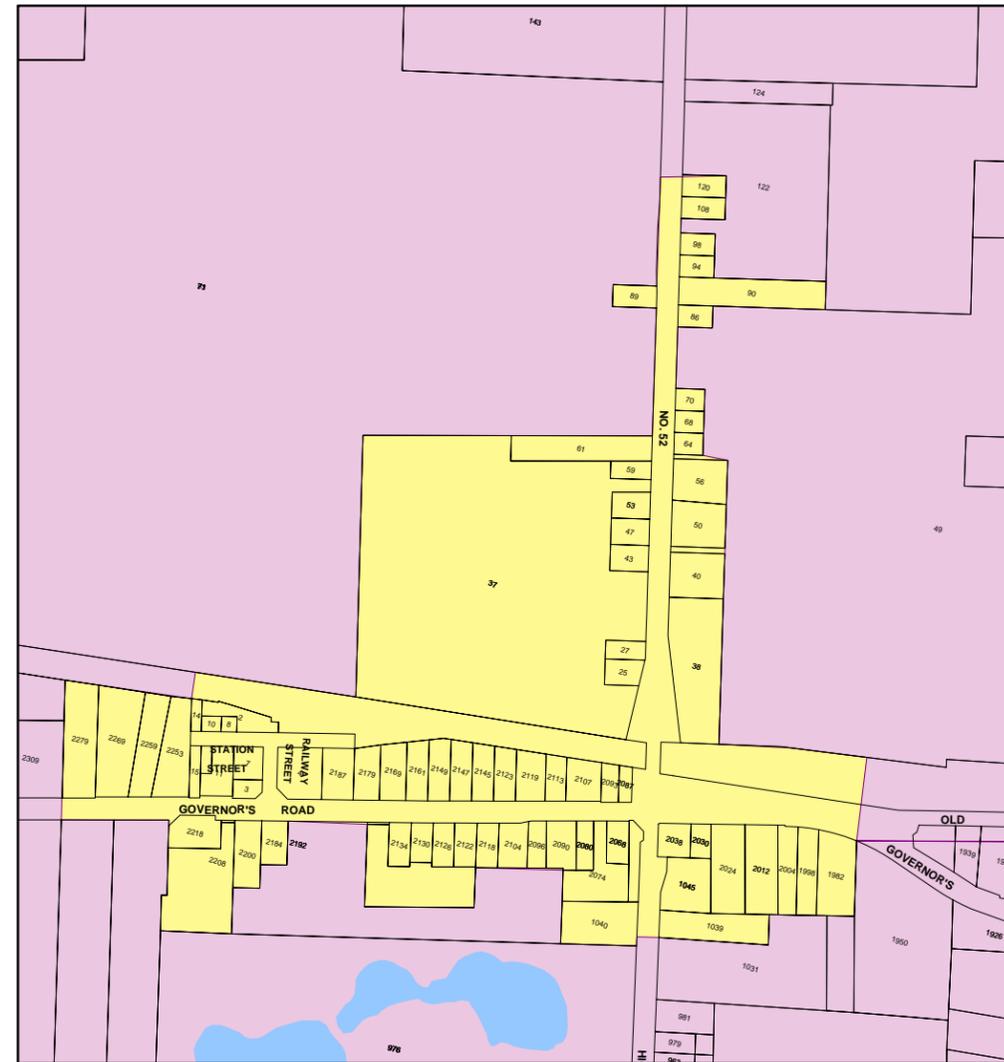
DETAIL 3 TO SCHEDULE A AND SCHEDULE B



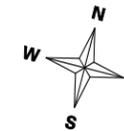
SCALE 1:10000



DETAIL 4 TO SCHEDULE A AND SCHEDULE B



SCALE 1:10000



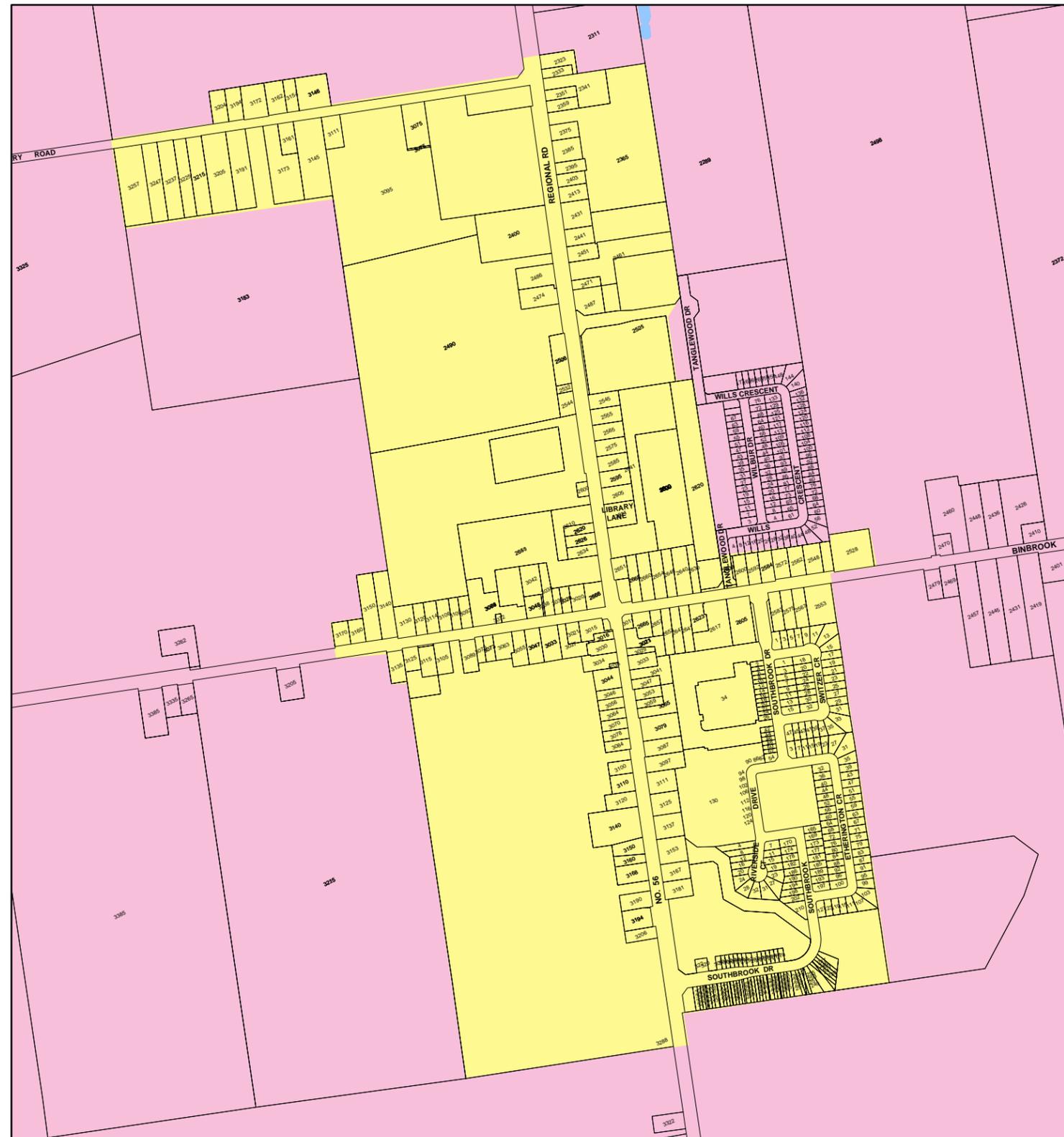
SCHEDULE 'A' Details 3 & 4

Details Discharge of Firearms and Bows Areas

LEGEND

- DISCHARGE OF FIREARM AND BOWS PERMITTED
- AREA SUBJECT TO SECTION 3(1) OF THIS BY-LAW

DETAIL 5 TO SCHEDULE A AND SCHEDULE B



SCALE 1:10000



Hamilton
City of Hamilton

SCHEDULE 'A' Detail 5

Details Discharge of
Firearms and Bows Areas

LEGEND

-  DISCHARGE OF FIREARM AND BOWS PERMITTED
-  AREA SUBJECT TO SECTION 3(1) OF THIS BY-LAW

ENFORCEMENT STRATEGY

Discharge of Recreational Firearms By-law 19-###

Municipal Law Enforcement

The general intent and purpose of the *Discharge of Recreational Firearm By-law 19-###* is public safety in the discharge of recreational firearms/bows. The purpose and objective of this Enforcement Strategy is to ensure compliance with the By-law.

As with all by-laws enforced by Municipal Law Enforcement (MLE), education, prevention and voluntary compliance are the desired outcome. As such, the general enforcement practice, unless directed otherwise, is to educate and seek voluntary compliance. However, one can anticipate that a certain percentage will resist any regulatory scheme regardless of MLE staff efforts to be congenial. Although staff approach will remain firm, fair, friendly and consistent, legal action will be initiated should efforts toward voluntary compliance fail.

Communications

Details of the new By-law will be shared with the public through a media release, social media and the City website.

A brochure with general information regarding the new By-law and contact information of the relevant enforcement agencies will be posted in key locations, including local conservation areas, stores and locations where hunting and fishing licenses and supplies can be purchased.

Action plan

Enforcement:

Enforcement will be complaint driven. The City's call center as well as MLE clerical staff will be provided with key information regarding the new By-law to assist in addressing calls received. Complaint calls regarding the sound of gun shots with no other detail will be immediately referred to Hamilton Police Services (HPS).

Staff experience is that most complaint calls involve the observation of hunting or shooting activity within a particular area combined with the sound of gun shot or the observation of a cross bow. Municipal Law Enforcement Officers (MLEOs) generally arrive before or after the discharge of a firearm or bow, and commonly deal with the property owner when unable to locate/identify the suspect(s). Municipal Orders may be issued to discontinue the activity, or compel the landowner to revoke consent or take actions to bar or prevent the unlawful entry onto the property.

Appendix “C” to Report PED16107(b)
Page 2 of 3

Most offenders are unfamiliar with the provisions of the By-law, or mistake the boundary for prohibited areas. The Municipal Order is an educational tool issued in the first instance before taking enforcement steps. Once issued, having presumed knowledge of the By-law, a charge would follow for re-offending or disobeying the order; and/or require any remedial action at the property owner’s expense.

Where a complaint is received, the MLEO will:

- interview the complainant;
- determine the municipal address for the location of the complaint
- using City tax base information, obtain contact information for owner

If the location of the contravention is within the prohibited area, (see Schedule A of the By-law - no recreational firearms activity is acceptable)

- make every reasonable effort to contact the property owner and discuss the complaint in person
 - emphasize owner responsibilities and obligations under the *Discharge of Recreational Firearms By-law*
 - educate the property owner and explain the role/procedure for City staff administering/enforcing the By-law
 - seek voluntary compliance to cease the contravention
- review with supervisor any recommendation to issue a charge under the By-law noting any required witness to the event

If the location of the contravention is outside of the prohibited area (see Schedule A of the By-law for prohibited area)

- check the MLE database to determine if an exemption permit exists for the location
- If a permit exists,
 - review complaint and the conditions of any permit found. If applicable, educate the complainant as to the conditions of the permit
- If no permit is found or if conditions of any issued permit may have been violated
 - make every reasonable effort to contact the property owner and discuss the complaint in person at the property
 - educate the property owner about the By-law and their responsibilities.
 - If any condition(s) of a permit may have been violated, review with Supervisor any recommendation to cancel permit
 - review with Supervisor any recommendation to issue a charge under the By-law noting any required witness

Protocols are already in place for the sharing of information between HPS and MLE. Similar protocols have been developed between MLE and the Ministry of Natural Resources and Forestry (MNR). These agencies will continue to meet yearly to discuss legislative, enforcement and administrative changes for the continuous

Appendix "C" to Report PED16107(b)**Page 3 of 3**

improvement of service levels to the community. MLE Policies and Procedures will be created that adopt the principles of this Enforcement Strategy and support the mandate of the enforcement partners.

Exemption permit:

Contained within this new By-law are provisions for an exemption permit system in certain permitted rural locations. After a satisfactory site inspection by a MLEO, an exemption permit may be issued following the Director of Licensing and By-law Services review and consultation with nearby landowners and the Ward Councillor. This permit would allow for the discharge of a recreational firearm(s) at approved locations during pre-arranged times. All exemption permits will be tracked within the MLE database making this information readily available to MLE clerical staff and MLEOs responding to complaint calls from concerned citizens.

At this time, all exemption permit applications, renewal applications and required payments must be made in person until an on-line option is available.

Conclusion

Both proactive and reactive enforcement strategies are important components in ensuring compliance with any by-law. This strategy focuses on an education and a consultative approach with complainants and home owners to conclude most matters. If necessary and viable, the issuance of a charge will act as a general and specific deterrent to prevent the individual from re-offending.



Hamilton

BUILT HERITAGE INVENTORY FORM

4c

Address King Street ...²³⁺ 25 King Street East ^(some maps) #36 King Community...Stoney Creek

Also known as... Millen's Store _____ Legal Description LOT 24 Cone 3

P.I.N. _____ Roll No. 251800355 Ward 5 Neighbourhood _____

Heritage Status: Inventory Registered Designated (Part IV / Part V) Easement (City / OHT) NHS
 Heritage Conservation District (if applicable): _____ Cultural Heritage Landscape (if applicable): Stoney Creek
 downtown landscape

Property Status (Observed): Occupied Building Vacant Building Vacant Lot Parking Lot

Integrity: Preserved / Intact Modified Compromised Demolished (date) _____

Construction Period: Pre 1867 1868-1900 1901-1939 1940-1955 1956-1970 Post 1970
 Year (if known) circa 1854 Architect / Builder / Craftsperson (if known) _____

Massing: Single-detached Semi-detached, related Semi-detached, unrelated Row, related Row, unrelated Other _____

Stores: 1 1 1/2 2 2 1/2 3 3 1/2 4 or more Irregular Other _____

Foundation Construction Material: Stone Brick Concrete Wood Other _____ Finish: _____

Building Construction Material: Brick Frame (wood) Stone Log Other _____ Finish: WOOD 1850's
- FIRE INSC MAP 1939

Building Cladding: Wood Stone Brick Stucco Synthetic Other: alum siding Finish: 2019

Roof type: Hip Flat Gambrel Mansard Gable Other _____ Type: _____

Roof Materials: Asphalt Shingle Wood Shingle Slate Tile/Terra Cotta Tar/Gravel Metal Other _____

Architectural Style / Influence:

- | | | | | |
|---------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|
| <input type="checkbox"/> Art Deco / Moderne
(1920s-1950s) | <input type="checkbox"/> Chateau
(1880-1940) | <input type="checkbox"/> Gothic Revival
(1830-1900) | <input type="checkbox"/> Neo-Gothic
(1900-1945) | <input type="checkbox"/> Romanesque Revival
(1850-1910) |
| <input type="checkbox"/> Beaux-Arts Classicism
(1900-1945) | <input type="checkbox"/> Craftsman / Prairie
(1900s-1930s) | <input type="checkbox"/> International
(1930-1965) | <input type="checkbox"/> Period Revivals
(1900-Present) | <input type="checkbox"/> Second Empire
(1860-1900) |
| <input type="checkbox"/> Brutalism
(1960-1970) | <input type="checkbox"/> Colonial Revival
(1900-Present) | <input type="checkbox"/> Italian Villa
(1830-1900) | <input type="checkbox"/> Post-Modern
(1970-Present) | <input type="checkbox"/> Vernacular |
| <input type="checkbox"/> Bungalow
(1900-1945) | <input type="checkbox"/> Edwardian
(1900-1930) | <input type="checkbox"/> Italianate
(1850-1900) | <input type="checkbox"/> Queen Anne
(1880-1910) | <input type="checkbox"/> Victory Housing
(1940-1950) |
| <input type="checkbox"/> Classic Revival | <input type="checkbox"/> Georgian / Loyalist | <input type="checkbox"/> Neo-Classical | <input type="checkbox"/> Regency | <input type="checkbox"/> 1950s Contemporary |

(1830-1860)

(1784-1860)

(1800-1860)

(1830-1860)

(1945-1965)

Other _____

Notable Building Features:

- X Porch: _____ Sill(s): _____ Tower/Spire Bargeboard Eaves: _____
- Verandah: _____ Lintel(s): _____ Dome Transom Verges: _____
- Balcony: _____ Shutters: _____ Finial Side light Dormer: _____
- Door(s) : _____ Quoins: _____ Pilaster Pediment Chimney: _____
- Stairs: _____ Voussoirs: _____ Capital Woodwork Parapet: _____
- Fire wall: _____ Cornice: _____ Panel Date stone Bay: _____
- Windows: _____ Column Cresting Other _____

Notes:

Context:

Historic Context Statement: Yes No Name of HCS Area: _____

X Streetscape (Residential / Commercial) Terrace / Row X Complex / Grouping Landmark

Multi-address parcel (list addresses): _____ Other _____

Related buildings: _____

Plan: Square Rectangular L U T H Cross Irregular Other _____

Wings: _____ Setback: Shallow Deep At ROW Other _____ Corner Lot

Accessory Features and Structures:

Features (e.g. stone wall, fountain):

Structures (e.g. shed, outbuilding):

Additional Notes:

Related Files: _____

Fire Insurance Mapping: 1898 Sheet No. _____ 1911 Sheet No. _____ 1949 Sheet No. _____ 1964 Sheet No. _____

Additional Documentation and Research Attached (if applicable):

Surveyed by:	Date:	Survey Area:
Staff Reviewer:	Date:	

PRELIMINARY EVALUATION

Physical / Design Value:	
<input type="checkbox"/>	The property's style, type or expression is: <input checked="" type="checkbox"/> rare <input type="checkbox"/> unique <input type="checkbox"/> representative <input type="checkbox"/> early
<input type="checkbox"/>	The property displays a high degree of: <input checked="" type="checkbox"/> craftsmanship <input type="checkbox"/> artistic merit
<input type="checkbox"/>	The property demonstrates a high degree of: <input type="checkbox"/> technical achievement <input type="checkbox"/> scientific achievement
Historical / Associative Value:	
<input checked="" type="checkbox"/>	The property has direct associations with a potentially significant: <input type="checkbox"/> theme <input type="checkbox"/> event <input type="checkbox"/> belief <input checked="" type="checkbox"/> person <input type="checkbox"/> activity <input checked="" type="checkbox"/> organization <input type="checkbox"/> institution
<input checked="" type="checkbox"/>	The property yields, or has the potential to yield, information that contributes to an understanding of a community or culture
<input checked="" type="checkbox"/>	The property demonstrates or reflects the work or ideas of a potentially significant: <input type="checkbox"/> architect <input type="checkbox"/> artist <input checked="" type="checkbox"/> building <input type="checkbox"/> designer <input type="checkbox"/> theorist
Contextual Value:	
<input checked="" type="checkbox"/>	The property is important in: <input checked="" type="checkbox"/> defining <input checked="" type="checkbox"/> maintaining <input checked="" type="checkbox"/> supporting the character of the area
<input checked="" type="checkbox"/>	The property is linked to its surroundings: <input checked="" type="checkbox"/> physically <input type="checkbox"/> functionally <input checked="" type="checkbox"/> visually <input checked="" type="checkbox"/> historically
<input type="checkbox"/>	The property is a landmark

Classification:

- Significant Built Resource (SBR)
 Character-Defining Resource (CDR)
 Character-Supporting Resource (CSR)
 Inventory Property (IP)
 Remove from Inventory (RFI)
 None

Recommendation:

- Add to Designation Work Plan
 Include in Register (Non-designated)
 Remove from Register (Non-designated)
 Add to Inventory – Periodic Review
 Inventory – No Further Review (Non-extant)
 No Action Required

Evaluated by: <i>K. WAKEMAN</i>	Date: <i>SEPT 2018</i>
HMHC Advice:	Date:
Planning Committee Advice:	Date:
Council Decision:	Date:
Database/GIS Update:	AMANDA Update:

forefathers, having lived on the same estate for more than two hundred years, as farmers.

Jane Foster was born August 13th, 1814, in the same parish and belonged to an old English family. They had eleven children. **Samuel (Millen)** died before the family left England, and was buried in Westwell Parish.

John (Millen) and **Jane (Foster)**, and nine children, all of whom were registered in the English Church records at Westwell Parish, Kent County, England, left England, as stated, in 1849.

On their way up the St. Lawrence River, and when the boat was between Quebec and Montreal, **James (Millen)**, who was less than two years of age, took ill and died. He was buried in the Anglican Church burying ground at Montreal

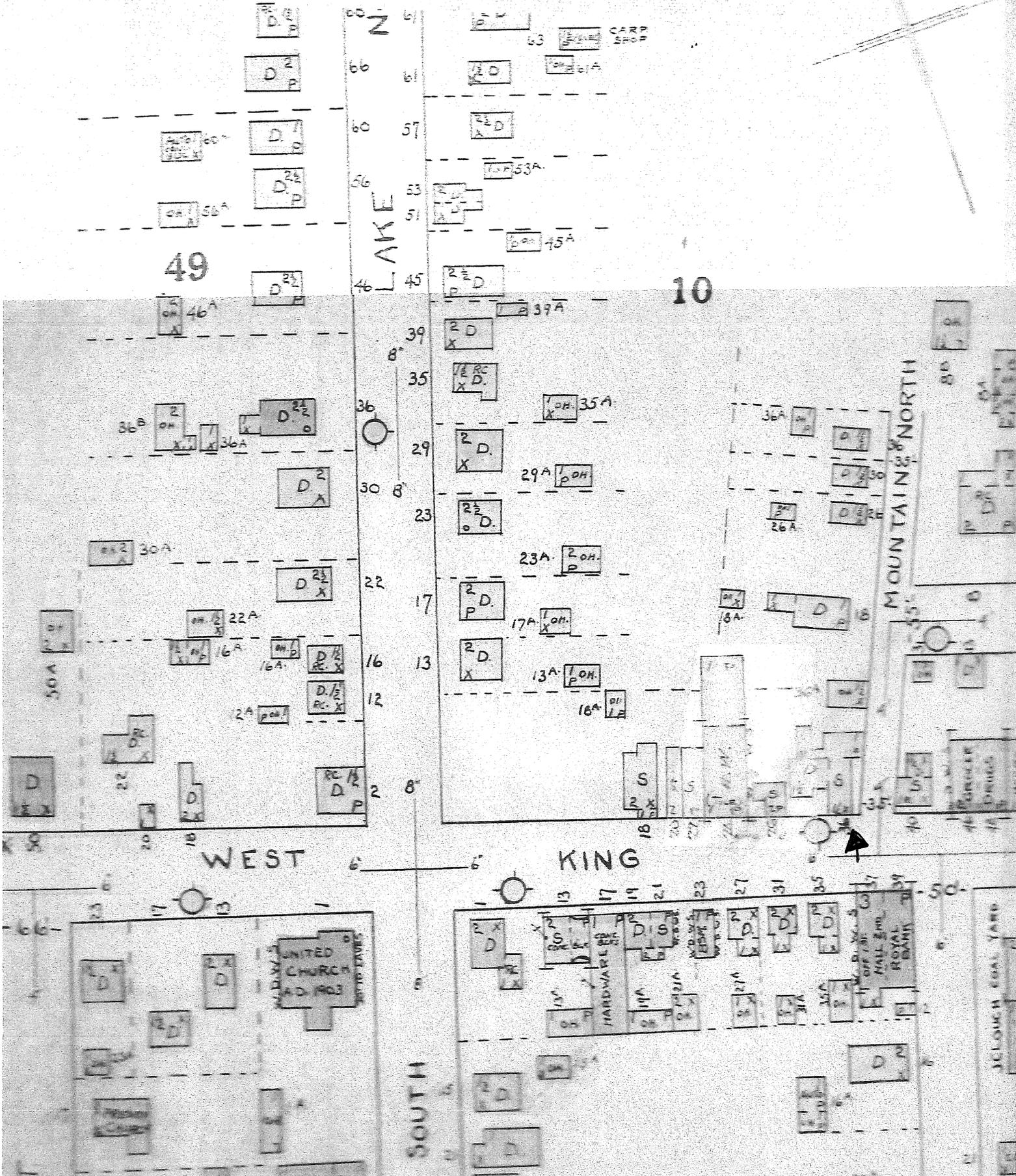
The family journeyed on to Hamilton, arriving there on June 4th, 1849.

They settled near the village of Stoney Creek, on a farm in the Township of Saltfleet, County of Wentworth. It was here that **Isaac (Millen)** was born

John Millen stayed in the Township of Saltfleet for some years. **Jane Millen (Foster)**, his wife, died November 29th, 1854, and her remains were interred in the Methodist Church cemetery at Stoney Creek. The names of their children, and the years of their birth are: **William (Millen)**, born June 25th, 1836; **Mary (Millen)** and **Elizabeth (Millen)** (twins), 1838; **Thomas (Millen)**, December 26th 1839; **Ann (Millen)**, 1842; **John (Millen)**, 1843; **Richard (Millen)**, 1845; **Stephen (Millen)**, February 23rd, 1846; **Samuel (Millen)**, died in England; **James (Millen)**, died in infancy; **George (Millen)**, 1849; **Isaac**, February 28th 1852. **Isaac** was the only child in this family to be born in Canada.

John Millen remained a widower a few years and subsequently married **Miss Sarah Canada**, of Saltfleet Township, by whom he had two daughters, **Jane (Millen)** and **Catherine (Millen)**, both of whom died when young; and one son, **Francis Byron (Millen)**, who was born in 1860.

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on Spectator

SATURDAY NOVEMBER 25 1950

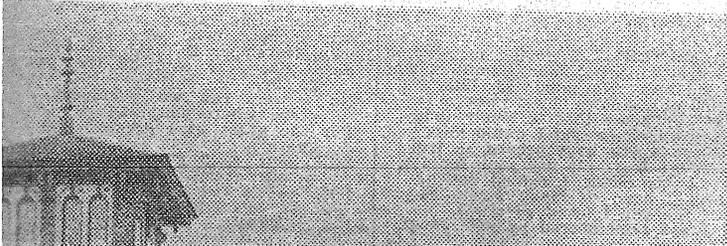
NUMBER 275

CLASSIFIED SECTION

From Dream Of The Past



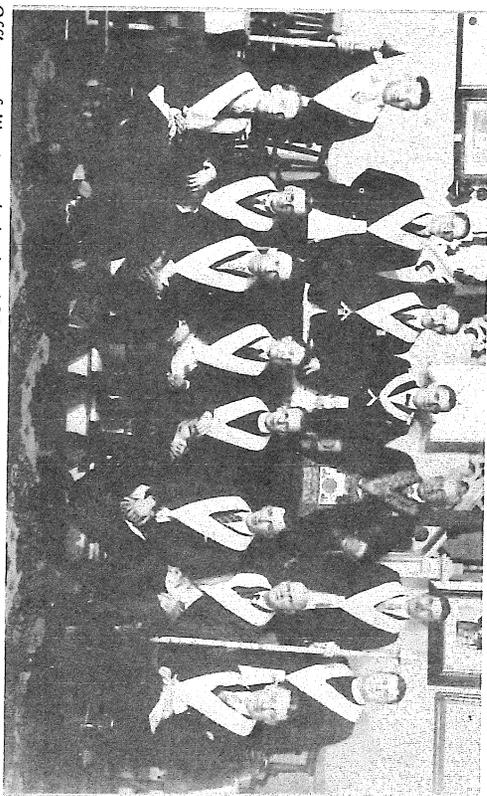
IN BUSINESS FOR 130 YEARS — Millen's general store at Stoney Creek, seen in this photograph, is believed to be the oldest place of business in that historic village. Old accounts indicate that business was actually done at the site in 1820. The first post office for the community was opened in this building in 1832 and was there for many years. The late A. R. Millen purchased the business in 1903 from Isaac Corman and it is still conducted by Mrs. Millen. Isaac Corman, it is understood, bought the business from John McNeilly who had secured it from Charles Moore. While others had previously owned and operated it, their names were not immediately available.



obtained from the Grand Lodge of Canada and a meeting was held in Wilson's Hotel on Monday, 15th day of August 1864, to instal the officers named on the Warrant. These officers were Bro. Walter McKay, Worshipful Master; Bro. Jos. DeClops, Senior Warden; Bro. William Pettit, Junior Warden; Bros. Abel Land, Enos McMillan, Wm. Campbell, Jacob Pettit, John S. Carle, Christopher Biggar and Levi Neil.

The Lodge moved into two rooms in the home of Charles Moore, which stood at the south-east corner of Lake Avenue and King Street in 1865 and shortly afterwards into rooms over the store owned by Alva Jones, later known as Richard Millen's store. On the 23rd of December, 1901, the Lodge moved again to the third floor of the Institute Building at the south-west corner of King Street and Mountain Avenue where the members climbed forty-four steps to the Lodge Rooms which were without running water or washroom facilities.

In 1954 a Committee, under the leadership of Rt. Wor. Bro. Leighton McDermid, purchased the present lot at Dawson and Passmore Streets and in 1957 the present modern brick Masonic Temple was erected on the site. The official builder was Wor. Bro. W. E. Bland but many brethren co-operated with labour and money.



Officers of Wentworth Lodge 166, A.F. & A.M., - 1926

Through the efforts of two members of the legal profession Wor. Bro. Ben Simpson and his illustrious father Most Wor. Bro. T. H. Simpson the Stoney Creek Masonic Hall Association was formed and a Charter procured authorizing the sale of Bond Certificates, non-

interest bearing, to the brethren and thus financing was arranged. The Building Committee became the first Trustees and were Rt. Wor. Bro. Leighton McDermid, Chairman; Wor. Bro. S. Lloyd Hagan, Secretary-Treasurer; Wor. Bro. W. E. Bland; V. Wor. Bro. D. R. McLeod and Wor. Bro. Alex Skene.

A new lodge named Thomas Hamilton Simpson Lodge No. 692 G.R.C. was formed consisting mostly of members of Wentworth Lodge with V. Wor. Bro. D. R. McLeod installed as first Worshipful Master.

One of the oldest Masons still attending Lodge in Stoney Creek is V. Wor. Bro. John H. Lee who is 93. He was elected Secretary in 1918 in Wentworth Lodge, retiring in 1924 and was elected again in 1926. He resigned in 1960 to become Worshipful Master of Thomas Hamilton Simpson Lodge No. 692 and in the same year received a Grand Lodge appointment as Superintendent of Works.

The new Temple has a spacious Board Room, modern cloak-rooms and washrooms, with a banquet room and kitchen in the basement. At present, nine other Lodges meet in this Temple pending construction of a new Central Masonic Temple in Hamilton to replace the one destroyed by fire in 1967.

The Lodge, while referred to as a fraternal organization, contributes time, money and energy to other organizations. High on its list is the giving of blood. The members also assist in the welfare of their members and their families. They also give financial support to an adopted orphan under the Christian Children's Fund.

Through the 110 years that this Masonic Lodge has been part of Stoney Creek its members have contributed a great deal to the welfare of the community but perhaps the greatest is their good citizenship.

THE ORDER OF THE EASTERN STAR

Historic Chapter No. 194 O.E.S. was instituted on April 12th, 1929, in Stoney Creek with Mrs. Myrtle McDougall of King Street East the first Worthy Matron and Mr. Walter Beswick, Worthy Patron. The Chapter is part of the largest organization in the world that has both men and women members. At present 40 percent of the membership are men.

It is mainly a benevolent organization where local Chapters, of which there are nearly 280 in Ontario, raise money in various ways to give their support to other organizations. Cancer research, Muscu-

Saltfleet—Then and Now

1792

1973

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The Town of Stoney Creek

Printed by

D. G. SELDON PRINTING LIMITED
Hamilton, Ontario, Canada

Storekeeper's daughter recalls general store

By Barb Joy

When Thelma Millen (now Felker) walked into her father's general store on King Street in her growing-up years, she hoped she wouldn't have to weigh coffee or pump molasses.

Of all the duties she performed in the store, those were the two she disliked.

"I always enjoyed selling," said Mrs. Felker in a recent interview. "But you know how molasses gets cold in the winter and then it's harder than ever to pump, and to fill up those jars the customers brought with them."

On entering the store, a customer would note the stairway about three-quarters of the way back that led to a partitioned part of the room above, where the Canadian Order of Foresters met and the Gun Club held its oyster suppers.

In another section at the top, stovepipes were stored while under the stairway stood large containers of the hated molasses and cans of coal oil.

TABLE WAS PILED WITH CLOTHING

In the middle of the store stood a long table piled with overalls, shirts and other assorted dry goods and under it were stacked pots, pans and various cooking utensils.

At the back of the store clustered shoes, boots and rubber boots. Sugar and flour were scooped from large bins, and coffee was ground then weighed according to the customer's orders.

"I was always hoping no one would come in and ask for a pound of coffee," said Mrs. Felker. "I just hated doing that."

On her way through the store, the young Miss Millen might note the spittle around the cuspidor.

"One customer just couldn't hit it so I made a sign reading 'If you can't hit the cuspidor, don't spit on the floor,'" she said.

Of the merchandise in the store, perhaps the most attractive to the young girl was the case of hair ribbons with drawers that pulled out to reveal the varied colors under glass covers.

NO PRICE TAGS WERE NEEDED

No price tags were on any article, as none were needed. They were all in the hands of the seven members of the Millen family who served the customers and made change from a box behind the counter.

A special day was Wednesday when Miss Millen climbed into the horse-drawn cart and made the long trip to Winona to pick up orders. Back at the store the next day, the stairway was lined with orders which were scrutinized to make sure coal oil wasn't resting too close to butter and lard.

And Friday saw the cart loaded for the trek to Winona again. Many of the customers were employees of E.D. Smith & Sons who were at work at the time of delivery.

"They'd leave the money on the table. We'd leave the order and the change," said Mrs. Felker. "In those days, people were honest. Now you don't dare leave your door unlocked."

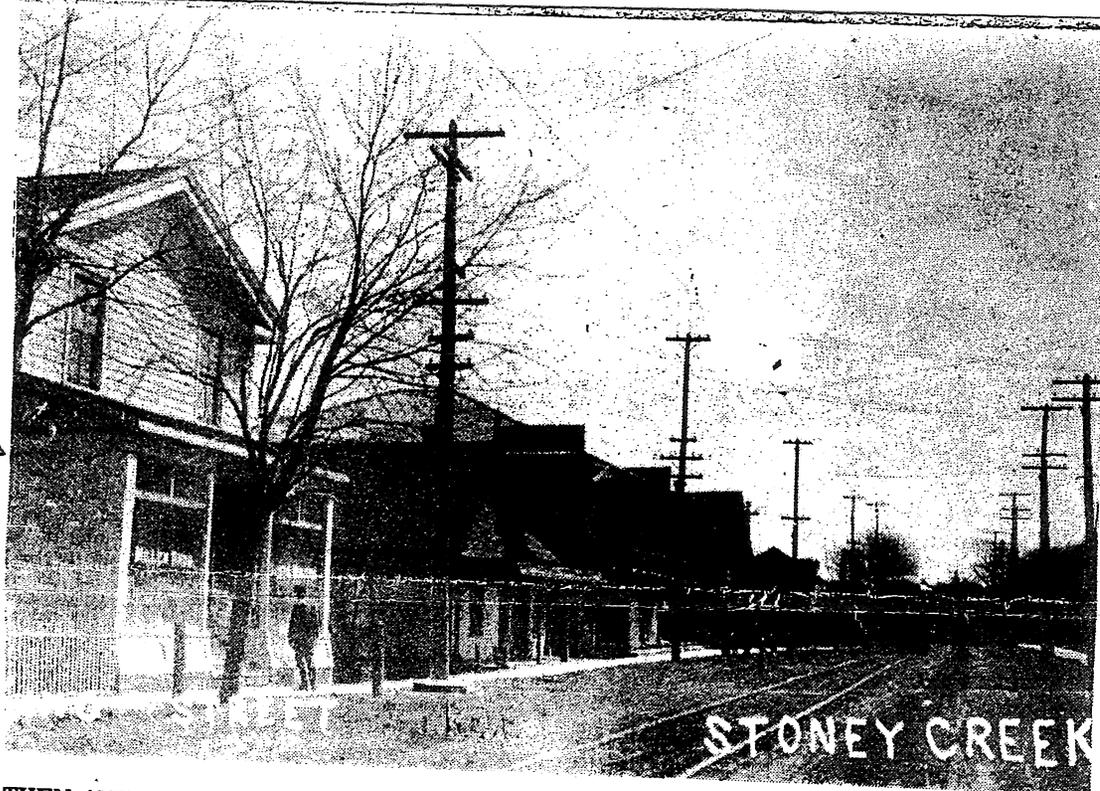
STORE BUILT IN LATE 1700s

The store, built in 1791 or '92, saw many storekeepers, among them Isaac Corman. From 1822 to 1899, part of it became a post office. Mrs. Felker's father bought it in 1903 and, after his death in 1937, her mother and then her brother kept the business going until it was sold in 1971. It is now an office building containing the business premises of Lyle Peterson, Accountant, on the corner of Mountain Avenue and King Street.

But, before it was sold, the old store had been modernized to become a self-serve. Gone was the camaraderie it once contained when men swapped news and opinions on politics.

"I remember Burton Corman asking my father if he thought he should run for reeve and my father said 'yes'," said Mrs. Felker.

It led to a long public life for Mr. Corman, and the incident demonstrated the close affiliation of Stoney Creek residents back in the days of the old general store.



THEN AND NOW: King Street has a different look today than it had when this old picture was taken, showing the Millen Store as it was then

and the radial railway running along the main street.



Stoney Creek News

circulating

Stoney Creek History: Millen's Farming Agriculture

by STEPHEN J. BECKROFT



Down on the farm

Later his uncle quit and joined up with Hames R. Twaddle. Together they opened another store until Mr. Twaddle became Postmaster in 1940. Mr. Twaddle had come to Stoney Creek in 1924, originally hailing from Scotland.

The old store prospered under the name "A.R. Millen" and did a good trade. Crawl Millen has a folding wooden rule, 36 inches long, with the inscription "A.R. Millen. Groceries and Dry Phone Winona 192-2". I was puzzled about the Winona number, but it seemed that prior to World War I, Stoney Creek Subscribers were listed with the Winona exchange.

"When I was six years old," said Crawl Millen, "my father opened a branch store at Grimsby Beach - in those days it was a busy place in the summer, with all the cottages. Uncle George stayed in Stoney Creek and minded the main store. We had one hired man at Grimsby Beach that summer; his name was Bob Adams. We always got a hundred loaves of bread delivered by Canada Bread Co. for the weekend and by the time we locked the door on Saturday night they had all gone. We did a good business at Grimsby Beach!"

We talked about stores opening on Sundays, and the legislation passed earlier this year which requires large stores to close on holidays and Sundays. If they stay open they are allowed a maximum floor space of 2,400 square feet and only three employees. "I don't see why they have to open on Sundays at all," he said. "My father never did. No stores did in those days. On Saturdays we were busy, though. People used to get the radial to the store. We stayed open until 10:30 or 11:00 at night."

I asked about the prices of merchandise in those days, but he didn't remember many.

"A lot of goods were sold by bulk. Vinegar from the barrel sold at 40 cents a gallon... mollasses were sold from the barrel, too. I remember that mollasses ran real slow in winter and if you were in a hurry it seemed to take even longer to fill the customer's container. We kept 100 gallons of oil out back and sold it for Adams. We always got a hundred loaves of bread delivered by Canada Bread Co. for the weekend and by the time we locked the door on Saturday night they had all gone. We did a good business at Grimsby Beach!"

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"I remember a lot of the old customers. Georgina Van Wagner - she married Bert Woodman and she died last April in the Brodie Nursing Home - the old Glover house that was. I remember old Doc. Thomson in Stoney Creek. He loved cheese, did Doc Thomson; the stronger the better. Then we had one regular customer - Mr. Griffith, who was cook at E.D. Smith's. He came in every night and bought ten cigars. We kept them for him specially."

We talked about credit. Apparently at the A.R. Millen store the E.D. Smith customers could buy groceries through the week and pay for them on payday at the end of the week. Farmers were able to get two or three months' credit until they sold their crops.

"We used to do a lot of deliveries. I hated making deliveries in the freezing rain or snow, but it had to be done. We had a covered van pulled by one horse, but the driver was out at front. Exposed to the weather! We did the Beach on Mondays, Red Hill on Saturdays, Eastern districts - such as Winona, Fruitland - on Wednesdays and Fridays. I did some deliveries and my brother Harold did others." He chuckled.

"I remember once we had been out together delivering on Barton Street - and - wow! it was it cold! One lady took pity on us, 'Come inside,' she cries, 'and have a dish of cider.'"

"Well, we did. I guess we weren't used to cider at that age. By the time we got home we were giggling and fooling around. My mother never said anything. I think she guessed what had happened, but she never said a word."

Dick Millen passed on just prior to the outbreak of World War II, in 1937. He brought the business through the heartbreaking years of the Depression, and it was those terrible bleak days that soured Crawl Millen against the store. The tragedy of customers who needed groceries but who were unable to pay for them - the continual worry of trying to keep the store open amidst poverty and heartache!

The store was then carried on by another son, Richard Millen who operated it through the war years and only sold out about ten years ago. So ended a history of over fifty years in the hands of the Millen family.

"I wish I'd kept all the papers," muses Crawlford Millen. "But at the time you don't think papers are of any value once they're finished with."

Both Mr. Millen and I would like to wish Bob Cenac all the best in his new venture. Maybe if he listens hard enough he WILL hear the walls talking!

they do now. Once you got the prices in your head, you were O.K. I don't know how these clerks remember the prices nowadays - they seem to change every week." He shook his head.

"I remember a lot of the old customers. Georgina Van Wagner - she married Bert Woodman and she died last April in the Brodie Nursing Home - the old Glover house that was. I remember old Doc. Thomson in Stoney Creek. He loved cheese, did Doc Thomson; the stronger the better. Then we had one regular customer - Mr. Griffith, who was cook at E.D. Smith's. He came in every night and bought ten cigars. We kept them for him specially."

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8- Augustus & Stephan Jones store 1790's

MILLEN'S STORE, STONEY CREEK

by Mrs. Kenneth Emberley

REFERENCE circulating

A history of Stoney Creek is unfolded in the telling of the story of Millen's Store at the corner of King Street East and Mountain Avenue North, the age of which dates, believably, from 1791-2 to 1967. It is the oldest continuing business in town -- and business is good! The end of September 1967 brought, after 64 years, the end of store-keeping for the A.R. Millen family in Stoney Creek.

In the days of "way-back-when" a man by the name of William Jones, with his brother James, built a big house and lived in it for many years with his growing family. A brother, Augustus, was the first land surveyor in upper Canada and later he received a grant of land of 2000 acres. He lived in the "Canada House" at Lake and King Streets, east side. William was given a 1200 acre grant of land. This acreage extended east of Lake Avenue from the mountain to the lake. The fine old Jones home "Locust Lawn" on Jones Street is now occupied by Murray Felker Johnson and his family. The house was well-built as were a number of smaller houses built nearby, presumably for employees.

The store was also built of wood with rough cast plaster coating adhering to long horizontal strips of 1½ inches by ½ inch width and thickness of material called lath. This method of construction is called "stucco" today and it retains heat well. It was greatly used in former days. It is thought that these buildings were built by the same brothers. A brother-in-law, James, built the Battlefield House. (see footnote #1)

The first store-keeper was William Jones and his son Stephan. His daughter Emmy was the first Postmistress. The post office later had official post date markings of 1822 - 26 and was housed here until 1899. Within memory of the writer, a verandah stretched across the front of the building and the store windows were of small panes of glass. A heavy screening of coarse wire mesh protected them. This has been modernized but the same door, lock and key are in use at the present. The walls of the foundation are very thick stone. At one time the upper story was used as a meeting place for fraternal societies -- the Maccabees, Orange Lodge, Foresters and Masons met there until the new town hall was built at the turn of the century. Entrance to the upper story was reached by an outside stairway on the east wall.

The early storekeepers included William Jones, Captain Williamson, E.B. Smith, Henry Wodehouse, J. Charles Moore, John H. McNeilly, Isaac Corman, and A.R. Millen.

Old accounts disclose that business was transacted at the site in 1820. The family of John Frederick Felker of Mud Street in the township of Saltfleet dealt here in trade and barter of farm products, fleeces and household necessities of the time. Pounds, shillings and pence was the currency used at that early date.

The mountain families of Adam Reid, the Stewarts, and the Lees, the mountain

known as "Millen Brothers" for some time, but later as A.R. Millen General Store. Page 573 of 574
When the store was first purchased, groceries were called for in person. Later deliveries were made weekly by Mr. Millen to the outlying homes. Again, later his sons helped in this work. One such trip was made every Wednesday to Winona, which took all day from early morning until dark, A hot mid-day meal was ready regularly each Wednesday at the Jerry Dean house in Fruitland.

The employees of E.D. Smith and Sons were regular customers. They frequently came by radial car with orders that were delivered the following Friday. There was also the "Beach Trip" once a week and calls were made at the Van Wagners, George Corman's, Roderick's, Lutz' Corey's, Boden's and Green's.

A.R. Millen was a very fine man, interested in the village and in municipal affairs. He enjoyed a Sunday walk, with an unnecessary cane and a necessary pipe. He was affectionately known throughout the area as "Dick" and an era and a way of life passed with his death in 1937. His wife, formerly Mary-Jane Cown, was an accomplished Horsewoman and rode side-saddle as was the custom. She and Miss Jessie Reid and Miss Alic Foran rode in Many Fall Fairs. Mrs. Millen was also a forthright woman of business and so continued the store successfully until her death in 1955. Both she and Mr. "Dick" were of pioneer stock.

The present Millen brothers and sisters, all of whom were born in the house attached to the store, include - Crawford, Harold, Richard, Evelyn, Fevez and Thelma Felker. Each has contributed to the success of the family business by clerking in the store, in the housekeeping and in making deliveries of groceries by horse, by truck or on foot. Five grandsons were also born here -- Lloyd Millen, Randall and Michael Felker, Barry and David Millen. Richard Cowan Millen succeeded his mother in business and for 12 years has been faithful to the family tradition in storekeeping. Under his management changes have been made and improvements have taken place. his wife, the former Ivy Lee, died in June 1966 after a long illness. They had two sons -- Barry and David -- who also assisted their father in the store. They work elsewhere now but continue to live at home.

May good wishes go with Richard as he leaves the business and home he has known all his life. Angelo Molina has bought the store and will continue the high standard of business that he assumed with the purchase of this property.

Good wishes for Richard and success for Molina.

Stoney Creek NEWS - October 1967

#1 - James Gage's mother was a sister to the Jones brothers , therefore James is a nephew not a brother-in-law as mentioned in this article.

11.1

CITY OF HAMILTON

MOTION

Planning Committee Date: May 14, 2019

MOVED BY COUNCILLOR FARR.....

MOVED BY COUNCILLOR

Effect of Heritage Designations on Property Values in Hamilton

That the appropriate staff from PED be requested to consult with the Realtors Association of Hamilton-Burlington in an effort to determine if they are aware of or possess any documented proof (attained through previous reports, studies or sales figures analysis) that a heritage designation decreases a property's value in Hamilton.