THE CORPORATION OF HALDIMAND COUNTY
COUNCIL IN COMMITTEE AGENDA

Date: June 18, 2019
Time: 9:30 A.M.
Location: Haldimand County Central Administration Building
Council Chambers

Pages

A. CALL TO ORDER

B. ROLL CALL

C. DISCLOSURES OF PECUNIARY INTEREST

D. PUBLIC MEETING FOR PLANNING APPLICATIONS

Councillor Shirton - Chair

1. PDD-19-2019 Zoning By-law Amendment to Permit Year-Round Residential Use - Giliauskas — 1
2. PDD-20-2019 Zoning Amendment to Fulfill a Condition of Consent - 1436586 Ontario Inc. — 20
3. PDD-21-2019 Zoning By-law Amendment to Permit Commercial Uses - Baird — 33
4. PDD-22-2019 Official Plan and Zoning By-law Amendment to Permit a Millwork and Carpentry Business - Williams — 51

E. PRESENTATIONS AND CONSIDERATION OF RELATED REPORTS (11:00 A.M.)

1. PDD-18-2019 Jarvis Master Servicing Plan Update — 77

   Presentation by J.L. Richards and Associates Ltd.

F. MOTIONS OF CONSENT

1. PDD-M02-2019 LPRCA Riverine Flood Hazard Mapping Update Study — 493
2. ECW-M01-2019 Speed Sign Protocol Updates — 496
3. ENG-01-2019 Accessible Parking Spaces at Hagersville United Church — 500
4. ENG-06-2019 Port Maitland Road No Stopping Zone - Parking Control By-law Amendment — 504

5. ENG-09-2019 All Way Stop - Sweets Corners Road and Lakeshore Road 507

6. ENG-10-2019 Main Street North, Jarvis No Stopping Zone - Parking Control By-law Amendment 514

7. ENG-11-2019 Budget Reallocation - Haldimand Road 3 and Haldimand Road 55 Resurfacing and Shoulder Widening 517

8. LSS-19-2019 1st Quarter Insurance Loss Report - 2019 520

G. DEPARTMENTAL STAFF REPORTS

1. COMMUNITY & DEVELOPMENT SERVICES

Councillor Dalimonte - Chair

1. PDD-23-2019 Removal of a Holding (H) Provision – Morris and Cucuz 529

2. PDD-24-2019 Final Updated Growth Plan and Bill 108 536

3. CDP-04-2019 Community Partnership Program – Dunnville Waterfront Park Flag Pole and Storyboard Installation 553

4. CDP-09-2019 Amendment Re: Town of Haldimand By-law 769/89 Designating the Cook-Peart House 562

5. EDT-08-2019 Rural Business and Tourism Community Improvement Plan - 4875 Rainham Road, Rainham Centre 575

6. EDT-09-2019 Downtown Areas Community Improvement Plan 2022 Main Street North, Jarvis 584

7. EDT-10-2019 Downtown Areas Community Improvement Plan - 138 Queen Street, Dunnville 600

8. Other Business

2. PUBLIC WORKS OPERATIONS

Councillor Corbett - Chair

1. Other Business

3. ENGINEERING & CAPITAL WORKS

Councillor Metcalfe - Chair

1. ECW-13-2019 Corporate Reorganization – Engineering Services Final Organizational Structure Costing Impacts 608

2. FCA-01-2019 Asset Management Policy 611

3. Other Business

4. FINANCIAL & DATA SERVICES

Councillor Patterson - Chair

1. FIN-10-2019 Investment Status Report – December 31, 2018 623

2. FIN-11-2019 Annual Tax Policy Report 636

3. FIN-13-2019 Applications for Assessment and Tax Adjustments as of May 2019 658

4. Other Business

5. CORPORATE & SOCIAL SERVICES

Councillor Lawrence - Chair

1. CLS-07-2019 Provincial Offence Act Write-Offs 662

2. LSS-13-2019 Road Closure and Conveyance of Part of Tuscarora Street and King William Street, Caledonia 696

3. Other Business

1. Correspondence from Jeff Miller, President, Haldimand Norfolk Housing Corporation Re: Shareholder Resolutions 2019-01 - Re-appointment of Board Members 702

6. CORPORATE AFFAIRS

Mayor Hewitt - Chair

1. Other Business

H. DELEGATIONS AND CONSIDERATION OF RELATED REPORTS (1:00 P.M.)

1. LSS-18-2019 Unsolicited Offer from 2589200 Ontario Inc., Frank Marshall Business Park, Dunnville 704

1. Omar Aboya 720

I. REPORTS FROM SPECIAL PURPOSE COMMITTEES, BOARDS AND COMMISSIONS

1. Minutes of the Police Services Board - April 24, 2019 722

J. UNFINISHED BUSINESS

K. NEW BUSINESS

L. INQUIRIES, ANNOUNCEMENTS AND CONCERNS OF COUNCILLORS

M. CLOSED SESSION

a proposed or pending acquisition or disposition of land by the municipality or local board

1. LSS-M12-2019 Additional Information Related to Report LSS-18-2019 Unsolicited Offer from 2589200 Ontario Inc., Frank Marshall Business Park, Dunnville

labour relations or employee negotiations

2. HRD-07-2019 Employment Matter – Proposed Grievance Settlement

N. ADJOURNMENT

HALDIMAND COUNTY

Report PDD-19-2019 Zoning By-law Amendment to Permit Year-Round Residential Use - Giliauskas

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To amend the Town of Dunnville Zoning By-law 1-DU 80 to permit year-round residency on lands zoned only to permit seasonal residency.

RECOMMENDATIONS:

1. THAT Report PDD-19-2019 Zoning By-law Amendment to Permit Year-Round Residential Use - Giliauskas be received;
2. AND THAT application PLZ-HA-2019-054 to amend the Zoning By-law 1-DU 80 to re-zone lands from “Agriculture” with Special Provision 37.4 to “Seasonal Residential-Holding (RS-H)” and to add a special provision to permit year-round residential use be approved for reasons outlined in Report PDD-19-2019;
3. AND THAT the By-law attached to Report PDD-19-2019 be presented for enactment;
4. AND THAT the Holding (H) provision removal By-law attached to Report PDD-19-2019 be presented for enactment and the General Manager of Community and Development Services be granted authority to remove the holding provision when the conditions relating to the matter are satisfactorily addressed;
5. AND THAT the proposal is deemed to be consistent with the Provincial Policy Statement (2014), and the Growth Plan for the Greater Golden Horseshoe.

Prepared by: Justin Miller, Planner

Reviewed by: Mike Evers, MCIP, RPP, BES, Director of Planning & Development Division

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The applicant is seeking to re-zone lands from “Agriculture” to “Seasonal Residential” and create a Special Provision to the Town of Dunnville Zoning By-law 1-DU 80 to permit year-round residency (Owner’s Sketch, Attachment 2). In addition to the special provision permitting year-round residency, a Holding (H) provision is proposed to ensure that suitable lot grading plans and final detailed designs for septic systems are completed for the lots. The applicant has provided initial septic and grading plans to support development; these plans demonstrate that private servicing and stormwater drainage are feasible and are to be finalized for construction prior to the removal of the Holding provision. Staff has reviewed the proposed zoning amendment on the subject lands against Provincial and County policy frameworks and the principle of land use is consistent with each. The Haldimand County Official Plan

permits limited conversion of seasonal residential properties to year-round residency. This application meets the criteria set out in the Plan, including the general character of the area, municipal road access and servicing capabilities.

Given the above, Planning staff recommends approval of this proposal for the reasons set out within this report.

BACKGROUND:

The block of approximately 100 lots that make up the majority of the Lakeshore Nodes of Johnson Road and Green's Line were created prior to the modern plan of subdivision process; as such, controls that insured orderly development with adequate provisions for septic and drainage were not clearly considered. Current planning processes no longer allow for this type of lot creation. The Special Provision (37.4) currently encumbering the subject lands was put in place to prohibit development in the early 1980s, recognizing the lack of a comprehensive plan for the lots created. The County's desire was that a comprehensive plan of subdivision would be developed for the vacant lots, but no such plan came forward. Around 1998, the southern most lots (closest to the Lake) in this block of lots began receiving development permissions, and the lots brought forward in this application represent the logical progression. Prior to receiving permission for development, the applicants are provided with an opportunity, on a site by site basis, to address those outstanding issues that were associated with the initial lot creation (largely grading/drainage and septic). In addition to permission to develop via the subject zoning amendment, the applicants are also seeking permission for year-round residency. Approximately 70 lots remain vacant with most of these being on private roads thus not suitable to year-round residency.

The application received is to consider an amendment to the Town of Dunnville Zoning By-law 1-DU 80 to re-zone lands from "Agriculture" to "Seasonal Residential" and create a Special Provision to permit year-round residency on the subject lands. The subject lands are made up of four lots that are currently vacant and are zoned "Agriculture" with a special provision (37.4) which prohibits a one family dwelling house until certain technical studies (e.g. lot grading) are completed, as described in the paragraph above. The applicant would like to amend the zoning of the subject lands in order to construct four dwellings on the four separate lots with permission for residency on a full time year-round basis. Council has recently reviewed and approved similar applications within this special provision area in November of 2017 and February of 2018.

The subject lands are located on the south side of Lighthouse Drive, east of Johnson Road (Attachment 1) and are generally surrounded by agriculture (north and west) and seasonal residences (south)—a few of which have already been granted special provisions to permit year-round residency. The subject lands are currently vacant and are described as Part Lot 19 DEP, Concession 5 SDR, Geographic Township of Dunn, Lighthouse Drive.

ANALYSIS:

Through the review of this proposal, Planning staff have identified the following key planning issues:

Provincial Policy:

Provincial Policy Statement, 2014

The Provincial Policy Statement (PPS) provides overall policy direction on matters of provincial interest relating to land use planning and development. Decisions affecting planning matters "shall be consistent with" the policies of the PPS. Through the PPS, the Province determines that Building Strong Communities is a provincial interest and is to be addressed, in part, through promoting efficient land

use and development patterns that support strong, livable and healthy communities, protect the environment and public health and safety, and facilitate economic growth.

The PPS states that healthy, livable and safe communities are sustained, in part, by accommodating an appropriate range and mix of residential uses to meet long-term needs, as well as avoiding development and land use patterns that may cause environmental or public health and safety concerns. In addition, the PPS sets out that municipalities shall provide for an appropriate range of housing types to meet the projected requirements of current and future residents, in part, by directing development of new housing to locations where appropriate levels of infrastructure and public service facilities are or will be available. To that extent, the subject lands and surrounding area is such that there is a suitable level of services available in the neighbourhood (municipal road, waste collection, emergency response, etc.), and therefore, Planning staff is satisfied that this proposal is deemed to be consistent with the PPS.

Provincial Growth Plan, 2019

The Provincial Growth Plan sets out policies that require the optimal use of the existing and new infrastructure to support growth in a compact and efficient form. The current proposal to allow year-round residential use conforms to this policy intent, as the use of existing services are proposed (existing municipal road, waste collection, etc.) without the need for expansion or significant upgrades to such existing infrastructure and service. Further, there is sufficient room for private water and sanitary systems on-site. Planning staff is of the opinion that this proposal complies with the intent of the Provincial Growth Plan.

County Policy:

Haldimand County Official Plan

The subject lands are designated 'Resort Residential Node' within Haldimand County's Official Plan. The Official Plan (OP) sets out that seasonal residential uses shall be the predominant type of land use along the Lakeshore, although a limited amount of conversion and new infilling for year-round use may also be permitted within appropriately designated areas. Amendments such as the subject application are dealt with on a site-by-site basis to satisfy OP policy that limits conversions of lands and sets out that the County is to retain a suitable and adequate seasonal (cottage) housing stock. Site specific applications allow this monitoring and management to take place. The Official Plan has established a number of criteria to determine the suitability of a proposal for conversion to year-round use. New development identified for year round use must have frontage on an open and improved road with adequate services (i.e. fire protection, waste collection, winter control, etc.). In general, if these criteria are met, conversion to year-round occupancy is permissible. Cottages on seasonal roads and lacking services will continue to be permitted on a seasonal basis. Lighthouse Drive and Johnson Road are considered open and improved municipal roads. In addition to the Official Plan's requirement for year-round development to have frontage on an open and improved road, the following criteria must be, and have been, evaluated:

i. Suitability of the area relative to Hazard Lands, Regulatory Shoreline, Industrial Influence Area, and other land uses;

   Planning Comment:

   The subject lands are located completely within the 'Resort Residential Node' designation of the Official Plan, are not subject to any Lake Erie hazards and are not regulated by a Conservation Authority. The subject lands are also located well outside of the industrial influence areas and are generally surrounded by similar residential uses.

ii. Need to maintain a reserve of cottage properties for seasonal use;

Planning Comment:

The proposed conversion would not have a significantly adverse impact on the existing seasonal supply within the area; only a few lots within the node appear to have been converted to year-round residency. This application does not represent a conversion of an existing seasonal cottage to year-round, but permits the creation of four (4) purpose built year-round homes on existing lots of record within the node. Any future conversion requests for other properties would be reviewed based on individual merit and the composition of the area at that time. Generally speaking, the conversion of a seasonal cottage for full time occupancy can only take place on publically maintained roads where services are already available. Cottages on private or seasonal roads will continue to provide the seasonal supply.

iii. Need to maintain public access and usage of the Lakeshore;

Planning Comment:

The subject lands are located on Lighthouse Drive in an area that is central to the Lakeshore Nodes of Johnson Road and Green's Line. The proposed development does not have direct access to Lake Erie and does not impact existing access to the Lake.

iv. Implications of assuming and/or upgrading existing private roads and rights-of-way;

Planning Comment:

The subject lands have frontage onto Lighthouse Drive, which is an open municipal road of a reasonable standard of construction.

v. Need to provide services such as recreational facilities, schools and busing, parks, garbage collection, medical, fire and police services, etc.;

Planning Comment:

Soft services are already provided to this area (i.e. waste collection, school busing, emergency services, etc.), and in addition, the residents of this area benefit largely from community facilities available in nearby Dunnville and Cayuga. Due to the proximity of these communities, the residents of the subject property would be adequately served by the present level of community facilities.

vi. Suitability of soils and lot sizes to support individual sewage disposal systems;

Planning Comment:

The subject lands are generally considered appropriately sized for private servicing, each lot is approximately 0.25 hectares (0.61 acres) and are above-average for what is common for many Haldimand County seasonal residential properties. Preliminary assessment of the site has demonstrated functionality, but a final detailed septic design is still required for the purposes of a building permit. The proposed Holding provision is intended to ensure the applicant's septic designer produces detailed design plans for a required septic system.

vii. Potential demands for municipal servicing and major infrastructure improvements;

Planning Comment:

The extent and scale of the proposed development is not anticipated to result in an increased demand for municipal (hard) services such as water and wastewater or significant upgrades to any existing infrastructure (i.e. roads). Water and wastewater services are not anticipated or likely to be provided for this portion of the County.

viii. Potential Negative Impacts on Natural Environment, areas such as wetlands, forested areas and fish habitat.

Planning Comment:

The subject lands are currently vacant; no negative environmental impacts are anticipated with this proposal.

In summary, the proposal conforms to the criteria in the Official Plan.

Town of Haldimand Zoning By-law 1-H 86

The subject lands are zoned 'Agriculture' with a special provision (37.4) which prohibits a one-family dwelling house as a permitted use in the Town of Dunnville Zoning By-law 1-DU 80. The special provision was intended to restrict development until a comprehensive plan could be considered for the lots under this provision. More specifically, the plan required a closer examination of servicing capabilities for lots of the size and number in this area. This was predicated on the limitations of septic technology that existed at that time and which typically require a lot of minimum of 0.4 hectare (1 acre) to accommodate large bed and replacement bed areas needed for the systems common at that time. Since then, technologies have advanced significantly to the point where smaller lots can be functional and accommodate development. This shift has allowed for a different approach to considering development of the lands in the subject area. As such, staff have determined that a number of the lots under this provision may proceed toward development under the 'Seasonal Residential (RS)' Zone provided satisfactory grading and septic plans can be provided to the County. As noted above, preliminary septic designs have been provided and deemed satisfactory. Preliminary grading plans have also been provided and are discussed in more detail below.

The applicants have provided the County with preliminary grading plans that include a mutual drainage agreement. The mutual drainage agreement would seek to outlet water along the back property lines, flowing east, to a centrally located County-owned drainage ditch that runs north-south towards the lake through the centre of the block of lots. County staff have determined that these preliminary grading plans are functional, but are dependent on the creation of a mutual drainage agreement to be registered on title for all benefiting/affected landowners. This would include the four contiguous lots subject to this application as well as the lot that is situated between them and the drainage ditch. The applicant is aware of the requirement to work with the adjacent owner to develop the mutual drainage agreement over their lands to connect into/drain to the ditch and the adjacent owner is similarly aware of the requirement for this accommodation. In addition to the requirement of the Holding provision for final septic plans, the Holding provision will remain in place until final grading plans and a mutual drainage agreement are in place to the satisfaction of the County.

The applicant proposes to re-zone to the 'RS' zone, which is consistent with the County's Official Plan. The 'RS' zone permits a summer cottage and an existing one family dwelling house (i.e. year-round dwelling that has existed and has been used continuously as a year-round dwelling since the implementation of Zoning By-law 1-DU 80 in 1980). This zoning convention is very dated and is something being assessed as part of the County's comprehensive zoning by-law project. The suitability of carrying on with this type of zoning for the majority of lakeshore properties needs to be examined and scope potentially narrowed (e.g. to those lots on private roads only).

The subject lots are vacant and have never been utilized for year-round occupancy. The proposed amendment (Attachment 3) seeks to expand the permitted uses on the lots to include year-round dwellings. The existing lots each have a frontage of approximately 30.48 metres (30 metres required). No zoning deficiencies have been identified or are proposed with this application; a detailed zoning review chart has been included as Attachment 5.

A Holding Provision is proposed to ensure suitable lot grading plan and detailed septic design are completed. The Holding provision may be removed once these matters have been addressed to the satisfaction of Haldimand County. A draft holding removal by-law is included as Attachment 4.

Planning Opinion:

Planning staff has reviewed the proposed zoning amendment on the subject lands relative to both Provincial and County policy frameworks and the principle of land use is consistent with each. Both the Provincial Policy Statement and the Haldimand County Official Plan permit development that is appropriate in relation to the infrastructure which is planned or available, and avoids the potential demand for increased municipal servicing and major infrastructure improvements. The Official Plan also permits limited year-round residential use within the Lakeshore Areas subject to certain criteria being satisfied. The zoning amendment addresses both policy requirements and is therefore, consistent with the Provincial Policy Statement 2014 and conforms to the policies in the Haldimand County Official Plan.

FINANCIAL/LEGAL IMPLICATIONS:

Not applicable.

STAKEHOLDER IMPACTS:

Building & Municipal Enforcement Services – No objections.

Hydro One – No objections.

Conservation Authority – Not regulated.

Roads Operations – No objections.

Planning and Development (Development & Design Technologist) – final grading plan required; including mutual drainage agreement registered on title.

Emergency Services – No objections.

Municipal Property Assessment Corporation – No objections.

No comments were received from the public or the Mississaugas of Credit First Nation, Six Nations Council and Union Gas.

Public – a few neighbours have concerns regarding drainage, specifically including a mutual drainage agreement. None of the concerned neighbours have specifically objected to the creation of a mutual drainage agreement, but they would like more information about how the proposed mutual drain may impact their properties.

Planning Comment: Although details regarding a mutual drainage agreement are currently not available, the Holding provision will remain in place until a mutual drainage agreement has been completed, and this agreement must be voluntarily agreed to by the affected neighbours.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

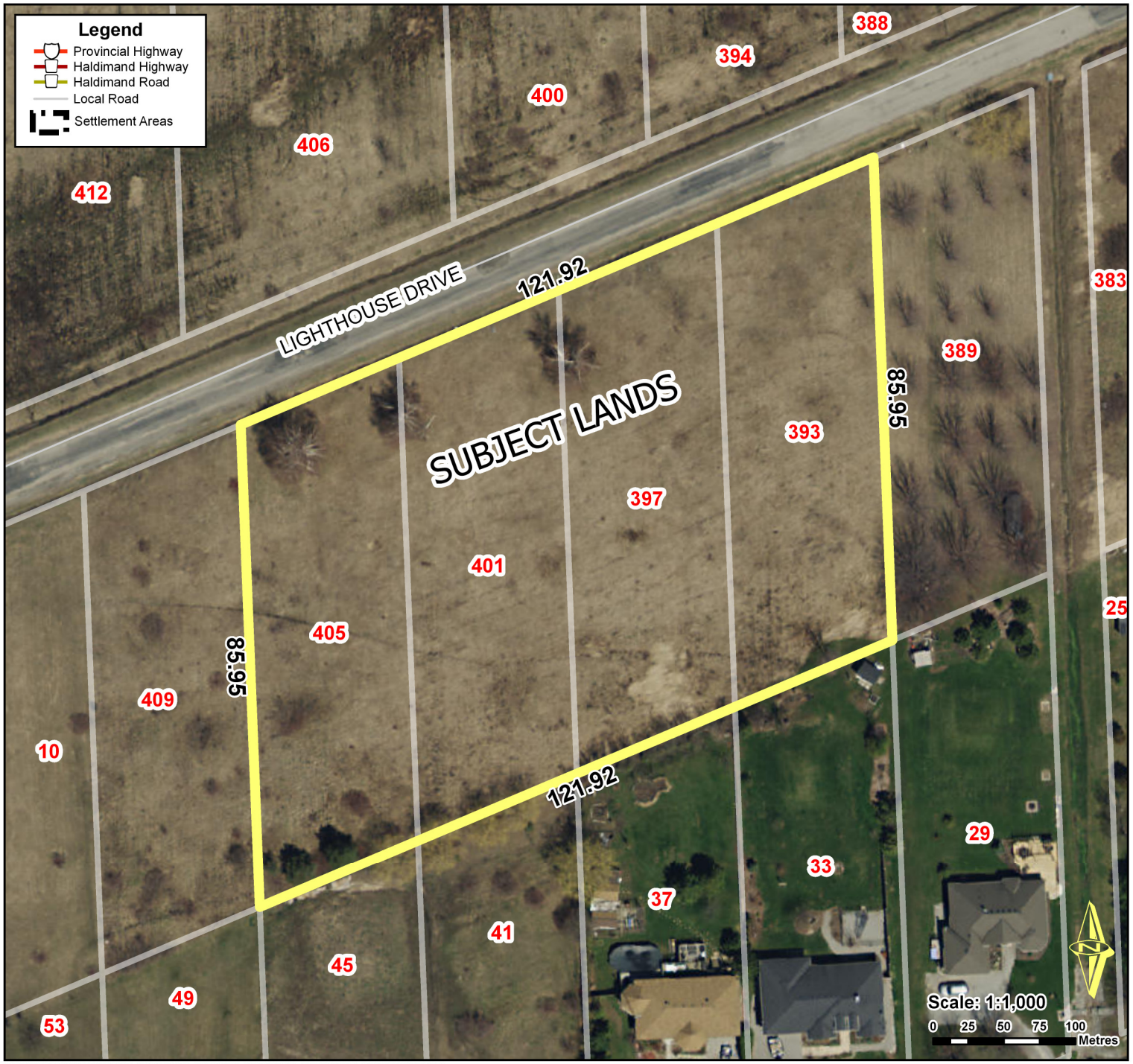
Policy: No

ATTACHMENTS:

1. Location Map.
2. Owner’s Sketch.
3. Draft Amendment to Zoning By-law.
4. Draft Holding Removal By-law.
5. Zoning Review Chart.

Location Map FILE #PLZ-HA-2019-054 APPLICANT: Gilliauskas

PDD-19-2019, Attachment 1



Location:

393, 397, 401, & 405 LIGHTHOUSE DRIVE
GEOGRAPHIC TOWNSHIP OF DUNN, WARD 5

Legal Description:

DUN CON 5 SDR PT LOT 19 DEP
72117 PCL 34,33,32, & 31

Property Assessment Number:

2810 021 003 00142 0000, 2810 021 003 00141 0000
2810 021 003 00139 0000, 2810 021 003 00138 0000

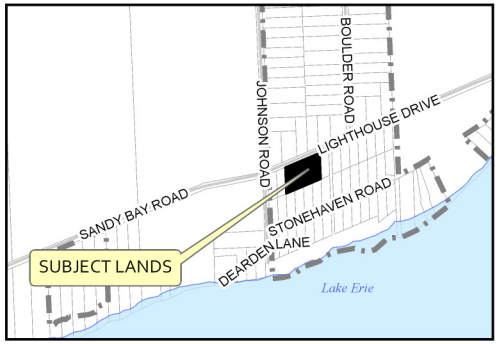
Size:

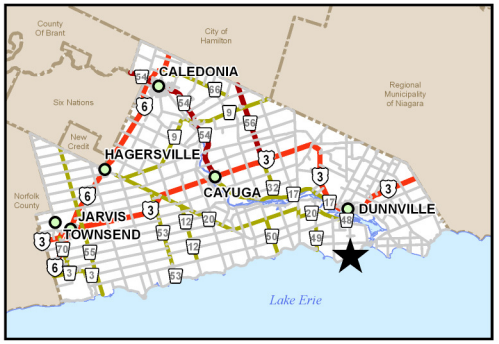
2.44 Acres

Zoning:

A (Agricultural)

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.





PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT,
GIS & GRAPHICS SECTION. May 2019

T:\Planning and Economic Development\PD\GIS\Applications\2019\PLZ\PLZ-HA-2019-054 (Giliauskas)\PLZ-HA-2019-054\PLZ-HA-2019-054.aprx

Owner's Sketch FILE # PLZ-HA-2019-054 APPLICANT: Gilliauskas

PDD-19-2019, Attachment 2

PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT,
GIS & GRAPHICS SECTION. May 2019

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PDD-19-2019, Attachment 3

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend the Town of Dunnville Zoning By-law 1-DU 80, as amended, in the name of Giliauskas.

WHEREAS this by-law is enacted in accordance with Sections 34 and 36 of the *Planning Act,* R.S.O. 1990, c.P.13 as amended;

AND WHEREAS this by-law conforms to the Haldimand County Official Plan;

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** this by-law shall apply to the lands described as Concession 5 SDR, Part Lot 19 DEP, Geographic Township of Dunn, now in Haldimand County and being shown on Maps 'A' and 'B' and being shown as the subject lands on Map 'B' attached hereto to form a part of this by-law.

2. **THAT** Schedule "A7 – Figure 2" to the Town of Dunnville Zoning By-law 1-DU 80, as amended, is hereby further amended by identifying the Subject Lands on Maps 'A' and 'B' and being shown as the subject lands on Map 'B' attached hereto and forming part of this by-law, as being rezoned from 'Agriculture' to 'Seasonal Residential – Holding'.

3. **THAT** Schedule "A7 – Figure 2" to the Town of Dunnville Zoning By-law 1-DU 80, as amended, is hereby further amended by identifying the Subject Lands on Maps 'A' and 'B' and being shown as the subject lands on Map 'B' attached hereto and forming part of this by-law, as having reference to Subsection 37.579.

4. **THAT** the following subsection shall be added to Section 37 (Special Provisions for Particular Parcels of Land) of said By-law 1-DU 80:

   37.579 That on the lands delineated as having reference to this subsection, the following provisions shall apply: That in addition to Subsection 15.1 Permitted Uses of the Seasonal Residential (RS) Zone, a one family dwelling house is also permitted.

5. **THAT** the Holding (H) provision shall remain in place on the subject lands on Map B attached to this by-law until such time as grading and septic plans are submitted to the County and approved for construction.

6. **THAT** Special Provision 37.4 be deleted from the subject lands on Map B attached to this by-law.

7. **AND THAT** this by-law shall take force and effect on the date of passage.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

_____
CLERK

HALDIMAND COUNTY By-law Number /19

MAP A - Key Map

Haldimand County
Geographic Township of Dunn
Ward 5

0 250 500 750 1,000 Metres

This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

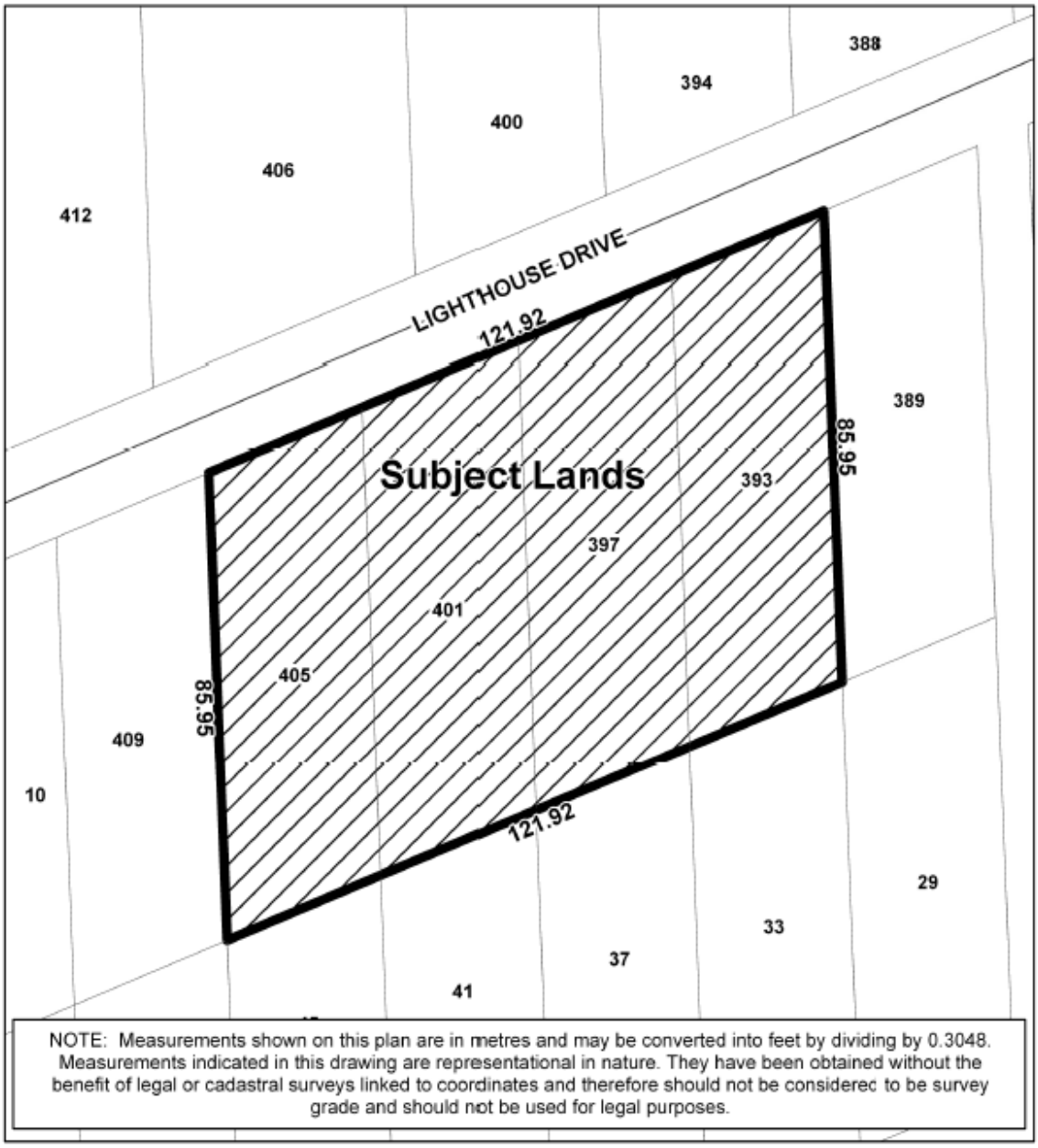
MAYOR CLERK

Ref: PLZ-HA-2019-054

MAP B - Detail Map

Haldimand County
Geographic Township of Dunn, Ward 5

SCALE: 1:1,000
0 10 20 30 40 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considerec to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2019-054

PURPOSE AND EFFECT OF BY-LAW NO. /19

This by-law affects lands located on the south side of Lighthouse Drive, in the northern portion of the Johnson Road and Green's Line Lakeshore Node, and legally described as Concession 5 SDR, Part Lot 19 DEP, Geographic Township of Dunn, now in Haldimand County, and having no municipal addresses.

The purpose of this by-law is to create a site specific permission by adding a one family dwelling house (single detached residential dwelling) to the list of permitted uses of the 'Seasonal Residential (RS) Zone'. This would allow for year-round occupancy of four proposed dwellings.

According to the Haldimand County Official Plan, the lands affected by the proposed amendment are designated Resort Residential Node.

Report No.:	PDD-19-2019
File No.:	PLZ-HA-2019-054
Name:	Giliauskas
Roll No.'s:	2810-021-003-00138; 2810-021-003-00139; 2810-021-003-00141; 2810-021-003-00142.

PDD-19-2019, Attachment 4

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend the Town of Dunnville Zoning By-law 1-DU 80, as amended, in the name of Giliauskas.

WHEREAS Haldimand County is empowered to enact this by-law, by virtue of the provisions of Sections 34 and 36 of the *Planning Act*, R.S.O. 1990, C. P13, as amended;

AND WHEREAS this by-law conforms to the Haldimand County Official Plan;

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** this by-law shall apply to the lands described as Concession 5 SDR, Part Lot 19 DEP, Geographic Township of Dunn, and being shown as the Subject Lands on Maps “A” and “B” attached hereto to form a part of this by-law.

2. **THAT** Schedule “A7 Figure 2” to the Town of Dunnville Zoning By-law 1-DU 80, as amended, is hereby further amended by removing the Holding (H) provision from the subject lands being shown on Map “B” attached to and forming part of this By-law at such time as the General Manager of Planning and Economic Development is satisfied that all conditions relating to the Holding (H) provision have been met and the said General Manager issues a memo to the same effect.

3. **AND THAT** this by-law shall take force and effect on the date of passing.

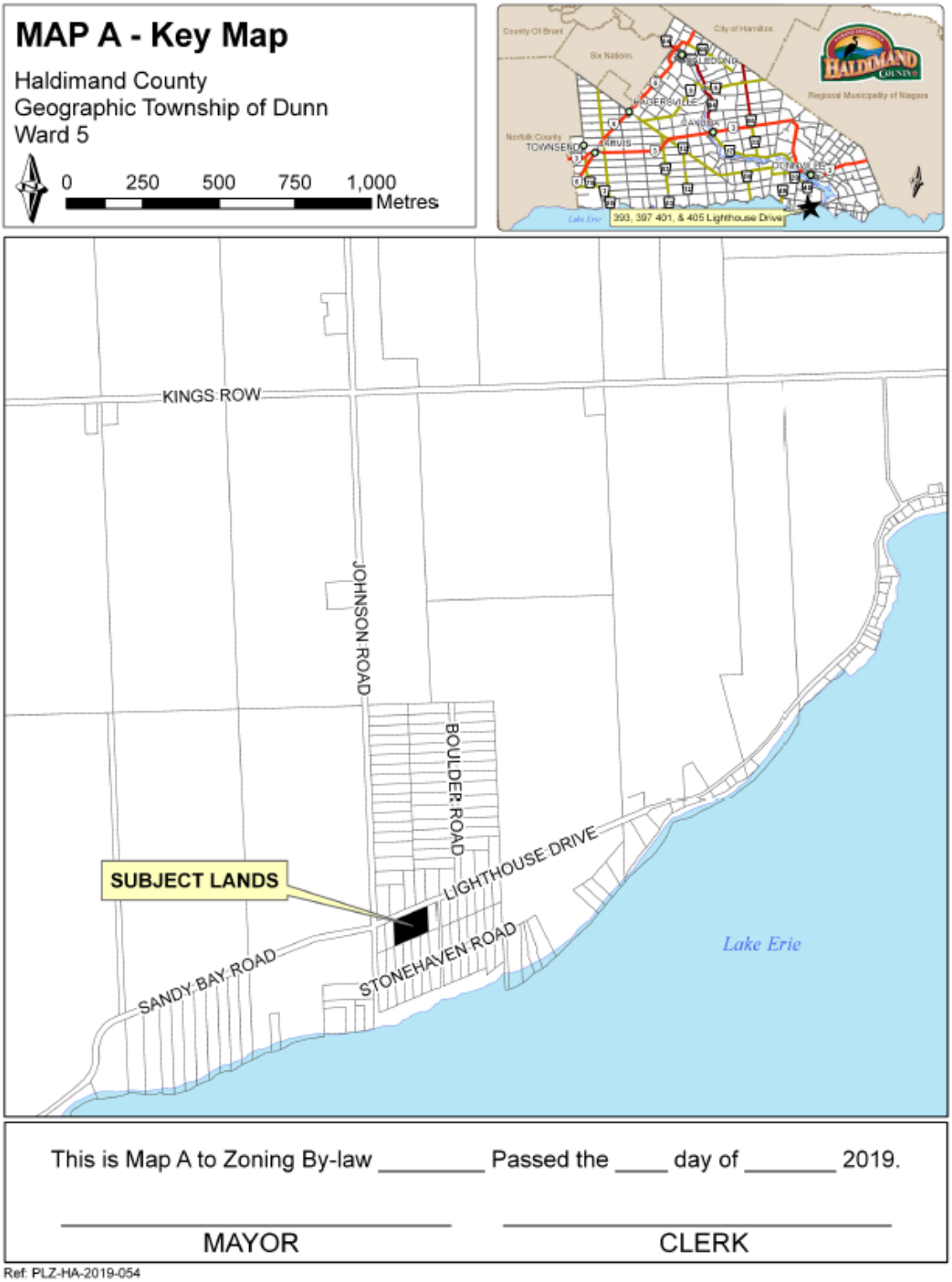
READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

_____
CLERK

PURPOSE AND EFFECT OF BY-LAW NO. /19



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

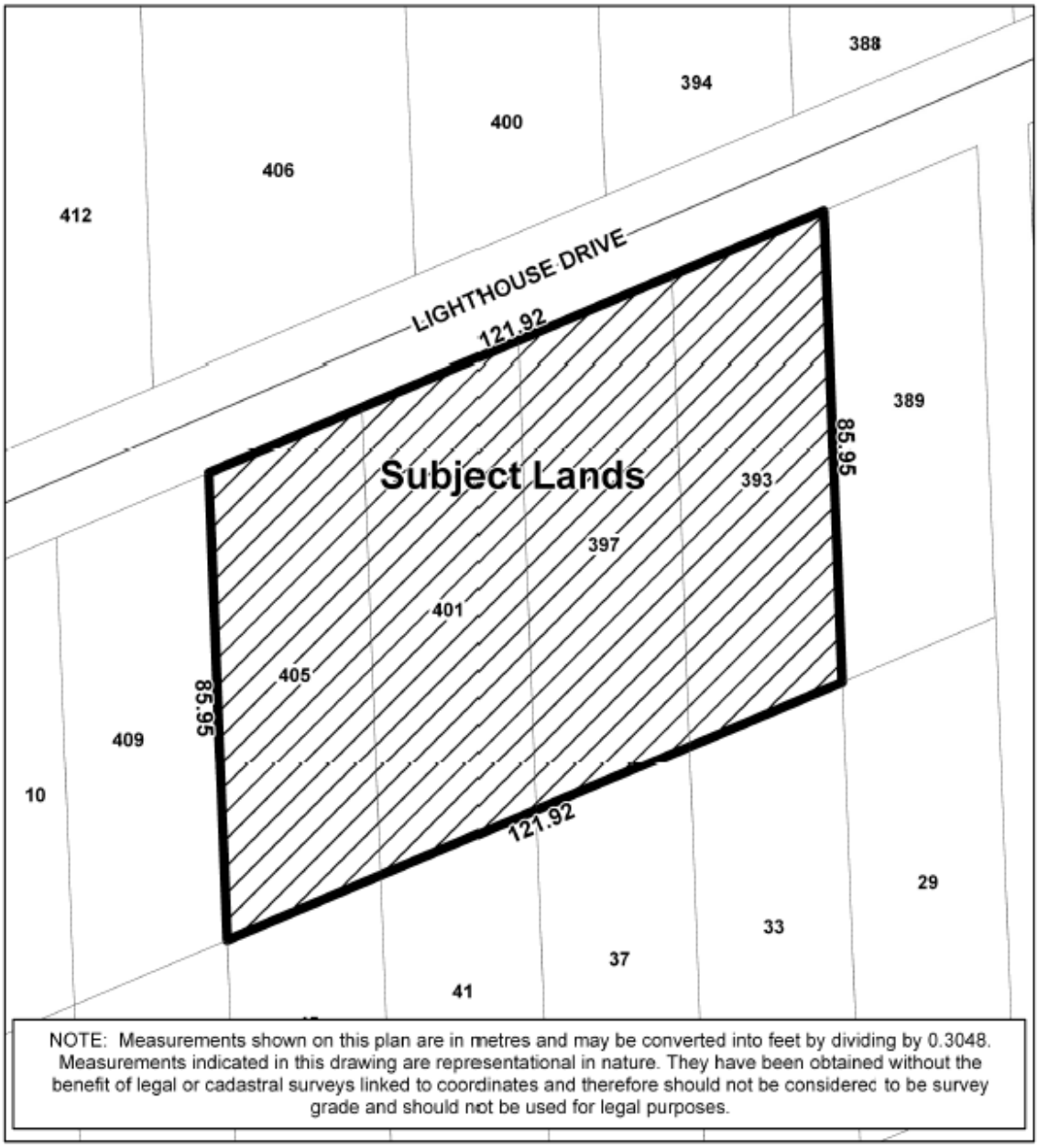
MAYOR CLERK

Ref: PLZ-HA-2019-054

MAP B - Detail Map

Haldimand County
Geographic Township of Dunn, Ward 5

SCALE: 1:1,000
0 10 20 30 40 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considerec to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2019-054

PURPOSE AND EFFECT OF BY-LAW NO. /19

This by-law affects lands located on the south side of Lighthouse Drive, legally described as Concession 5 SDR, Part Lot 19 DEP, Geographic Township of Dunn, with no municipal addresses, Dunn.

The purpose of this by-law is to remove the Holding (H) provision from the zoning of the subject lands at such time as the General Manager of Planning and Economic Development is satisfied that:

a) a grading plan is submitted to the County and approved for construction; and
b) a detailed septic design is submitted to the County and approved for construction.

Report Number:	PDD-19-2019
File Number:	PLZ-HA-2019-054
Related Files:	n/a
Name:	Giliauskas
Roll No.'s:	2810-021-003-00138; 2810-021-003-00139; 2810-021-003-00141; 2810-021-003-00142.

Zoning Confirmation Chart

Owner/Applicant: Price	*Application #:* PLZ-HA 2018-049	*Assessment Roll #:* 2810.021.003.00138; 2810.021.003.00139; 2810.021.003.00141; 2810.021.003.00142.
Location of Property: *Legal Address:* Concession 5 SDR, Part of Lot 19 DEP, Geographic Township of Dunn (no municipal addresses)		
Applicable Zoning By-law: Town of Dunnville Zoning By-law 1-DU 80		*Proposed Zoning:* 'RS'
Proposed Zoning Amendment: To permit year-round residency		

Development Standards	***Required***	***Proposed (Parts 1 and 2)***	***Deficiency***
Lot Area	1,855 m²	~2,468.7 m²	-
Lot Frontage	30 m	~30.48 m	-
Front Yard Setback	9 m	n/a	-
Exterior Side Yard	9 m	n/a	-
Interior Side Yard - Right	3/1.2 m	n/a	-
Interior Side Yard – Left	3/1.2 m	n/a	-
Rear Yard	9 m	n/a	-
Maximum Building Height	11 m	n/a	-
Minimum Usable Floor Area	65 m²	n/a	-
Parking (spaces):	2	n/a	-
Year-round Residency		Proposed	Not permitted

**Please note, these standards are four each of four lots, each lot having the same dimensions.*

Signatures: Planner: Justin Miller Building Inspector: Dan Wallman

HALDIMAND COUNTY

Report PDD-20-2019 Zoning Amendment to Fulfill a Condition of Consent - 1436586 Ontario Inc.

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To fulfill a condition of consent related to the severance of a surplus farm dwelling.

RECOMMENDATIONS:

1. THAT Report PDD-20-2019 Zoning Amendment to Fulfill a Condition of Consent - 1436586 Ontario Inc. be received;
2. AND THAT application PLZ-HA-2019-042 to amend the City of Nanticoke Zoning By-law NE-1 2000 to prohibit future residential development and home occupation opportunities on the retained farm lands be approved for reasons outlined in Report PDD-20-2019;
3. AND THAT the proposal is deemed to be consistent with the Provincial Policy Statement (2014), and the Growth Plan for the Greater Golden Horseshoe;
4. AND THAT the By-law attached to Report PDD-20-2019 be presented for enactment.

Prepared by: Benjamin Kissner, Planner

Reviewed by: Mike Evers, MCIP, RPP, BES, Director of Planning and Development

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

This Zoning By-law Amendment is a condition of consent related to a surplus farm dwelling where the lands to be severed exceed the maximum lot size provisions stated in the Haldimand County Official Plan, and as a result, the retained lands need to be re-zoned in order to remove a one family dwelling and home occupation as a permitted use in order to comply with Provincial Policy. The severed lot area exceeds the standards of the Official Plan due to the fact that the dwelling is situated approximately 245 metres from the road.

Planning staff are of the opinion that this proposal is in conformity with the Provincial Policy Statement (2014), complies with the Provincial Growth Plan (2019), conforms to Haldimand County's Official Plan, and maintains the general intent and purpose of the City of Nanticoke Zoning By-law NE-1 2000. There is sufficient justification for the related consent (which proposes to create a larger than typically permitted residential lot) and this proposed zoning amendment. Planning staff recommend approval of this proposal for the reasons set out within this report. A public meeting has been scheduled to correspond with the presentation of this report. A public notice sign has been posted at the site and was visible when the Planner conducted a site visit.

BACKGROUND:

The proposed zoning amendment is required to fulfill a condition of consent within surplus farm dwelling severance application PLB-2018-132, which was conditionally approved by the Committee of Adjustment at its meeting on August 9, 2018. The severance resulted in the creation of a 1.05 hectares (2.6 acres) parcel as a surplus farm dwelling and the retention of an agricultural parcel of approximately 37.08 hectares (91.6 acres) (shown on Attachments 1 and 2). The subject proposal is required to fulfill a condition of consent because the conditionally severed surplus farm dwelling parcel is larger than the maximum lot size of 0.6 hectares (1.5 acres) and as such, the retained lands are not subject to the automatic zoning provision 3.36 of the City of Nanticoke Zoning By-law NE-1 2000, which prohibits residential development on the retained farm parcel when surplus farm dwelling severances are less than 0.6 hectares (1.5 acres). The larger severance size is the result of the length of the driveway to provide access to the residential use.

The subject lands are located on the south side of 4th line. The site is legally described as Walpole Concession 13 Part Lot 8 Regular, and known municipally as 670 Concession 13, Walpole. A General Location map can be found in Attachment 1 with the overall lot configuration being shown in Attachment 2 (the owner's sketch). The conditionally severed parcel is irregularly shaped and approximately 1.214 hectares (3 acres) in size which is the result of the distance that the dwelling is set back from the road. The retained farm parcel is approximately 33 hectares (81.5 acres) in size and is intended to continue to be used for agricultural purposes. The proposal includes an alternative standard with regards to the lot frontage for the severed lands due in part to efforts to preserve farmland with the farm parcel. The lot pattern surrounding the frontage of the severed lands is constrained, and as a result will only be 16 metres, where the City of Nanticoke Zoning By-law NE-1 2000 requires 30 metres. Planning staff supports this reduction in frontage, and has not received any concerns through the circulation of the proposal.

ANALYSIS:

Planning staff have determined key planning issues related to this application. They are as follows:

Provincial and County Land Use Policy:

1. Provincial Policy Statement, 2014

   The Provincial Policy Statement (PPS) 2014 policies are generally prohibitive when it comes to the creation of lots within prime agricultural areas in order to protect prime agricultural land. However, the PPS permits lot creation in prime agricultural areas for limited purposes and specifically limited to agricultural uses, agricultural-related uses, infrastructure, and a residence made surplus by farm consolidation provided that new residential dwellings are prohibited on the remnant farm parcel. The overall intent of the agriculture policies within the PPS is to limit the fragmentation of agricultural land and to limit the impact of non-farm dwellings on agricultural operations. In the context of this proposal, although the lot is larger than typically permitted, it is Planning staff's opinion that the proposed size of the severed lands will not lead to the unnecessary removal of land from a prime agricultural area, that the proposed lot configuration will not negatively impact the functionality or viability of the farm parcel, and that there is sufficient justification warranting the need for a lot size larger than typically permitted. This is due to the location of the dwelling on the lot, such that it is approximately 245 metres from the road. In light of the added length of the driveway, the applicants have worked to minimize the amount of agricultural land removed from production. The subject proposal for a zoning amendment to prohibit future residential opportunities on the retained lands ensures that the proposed severance is in keeping with the intent of the PPS. Planning staff are of the opinion that this

proposal maintains the intent of these policies; therefore, the proposal is consistent with the PPS.

2. Provincial Growth Plan, 2019

The Provincial Growth Plan–Places to Grow was also reviewed by Planning staff in relation to this proposal. The Growth Plan's policy addresses the protection of prime agricultural lands both directly and indirectly. Based on Planning staff's review, staff is of the opinion that the subject proposal is not in conflict with and is in keeping with the overall intent of the Provincial Growth Plan.

3. County Policy

i. Haldimand County Official Plan

The subject lands are designated as 'Agriculture' and subject to the related policies within the Official Plan.

The subject lands are designated as 'Agriculture' and subject to the related policies within the Official Plan. Haldimand County's Official Plan, similar to the Provincial Policy Statement (2014), permits new lot creation in agricultural areas for dwellings made surplus due to farm consolidation, provided that future residential development on the retained farm lands is prohibited. The intent of the subject proposal is to ensure this Provincial and local policy requirement is met. The Official Plan's 'Criteria for Surplus Farm Dwelling Consents' policies specifically permit the granting of a severance for a habitable dwelling, provided the dwelling is of a minimum age of ten years and has been made surplus through farm consolidation where a portion of the farm holding contains two or more habitable dwellings within the County. The criteria further requires that the creation of a surplus farm dwelling lot shall generally be 0.4 hectares to 0.6 hectares (1.0 to 1.5 acres) in size to minimize the amount of agricultural land or productive forest land being taken out of production.

In the subject proposal, the size of the proposed severed lands measures approximately 1.05 hectares (2.6 acres), which exceeds the standard lot size of a surplus farm dwelling within the agricultural area. However, the Official Plan provides some flexibility in the creation of the lot size for surplus farm dwellings and Planning staff have supported larger lots previously when there are demonstrated constraints to meeting the Official Plan standard. Some examples include topography, the need to protect natural features, the situation of a dwelling on the lot, location of wells and septic systems servicing the dwelling, constraints to using accessory structures for agricultural purposes such as the access or proximity to the new dwelling, and/or lot configuration issues created by the requirements of other external agencies. In this circumstance, Planning staff have determined that there is sufficient rationale to justify a larger lot size than typically permitted. The location of the dwelling on the lot has resulted in the driveway length being approximately 245 metres (804 feet), the land area associated with this driveway has contributed to the total proposed lot area that is to be severed from the original parcel. Further to this, it should be noted that efforts have been made by the applicant to minimize the amount of agricultural land conveyed and dedicate only as much land as required to the dwelling, access and related residential features. In sum, this provides suitable justification for Planning staff to recommend approval of this proposal.

Planning staff are further of the opinion, that the 'Criteria for Surplus Farm Dwelling Consents' tests have been met as the dwelling is surplus and more than 10 years old (constructed in 1890), private services are available, the proposed lot configuration will not negatively impact the functionality or viability of the farm, the proposal is appropriately separated from any licensed pits and/or quarries, there is direct frontage and access on a public road and there are no perceived negative impacts on the natural environment. Planning staff's opinion is that there is

sufficient justification to support the related severance and the subject proposal which recognizes a lot larger than the Official Plan's recommended lot size.

ii. Minimum Distance Separation (MDS) Requirements

Both Provincial and County policy requires that measures be taken to ensure that agricultural and residential uses are compatible with each other in an effort to reduce future land use conflicts. This is accomplished, in part, by requiring new lots to satisfy Minimum Distance Separation (MDS) requirements which address issues such as odour from livestock facilities. No livestock facilities were observed on the subject or surrounding lands, and the applicant has indicated that there are no livestock facilities on or within 500 metres (1,640.4 feet) of the subject lands.

iii. City of Nanticoke Zoning By-law NE-1 2000

The subject lands are zoned 'Agricultural' (A) in the City of Nanticoke Zoning By-law NE-1 2000. The intent of this proposal is to fulfill a condition of consent related to a surplus farm dwelling severance by prohibiting future residential development and home occupations on the retained farm lands.

As the intent of this proposal is to fulfill the requirements of both provincial and local policy by prohibiting future residential development and associated home occupations on the retained farm lands, Planning staff are of the opinion that the subject proposal is appropriate. There is a special provision that will be applied to the site to recognize the narrow frontage that has been provided for the lot. This has been evaluated in terms of the applicable policy, and staff are satisfied that the effort to minimize the amount of farmland that is removed form production is suitable to justify a reduction in frontage. In this situation the applicants are proposing 16 metres of frontage where the by-law requires 30 metres. Any additional property-width would represent more farmland being removed from production; thus staff are satisfied with the frontage that has been proposed. The zoning deficiencies required to be addressed through this application are shown in the attached Zoning Review Chart (Attachment 4). A draft Zoning By-law has also been completed and included within Attachment 3.

FINANCIAL/LEGAL IMPLICATIONS:

Not applicable.

STAKEHOLDER IMPACTS:

Building & Municipal Enforcement Services – No objections.

Grand River Conservation Authority – No objections.

Roads Operations – No objections.

Planning and Development (Development & Design Technologist) – No objections.

Water and Wastewater Engineering & Compliance – No objections.

Emergency Services – No objections.

No comments were received from the public or the Mississaugas of the Credit First Nation, Six Nations Council, Hydro One, MTO, MPAC, and Union Gas.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

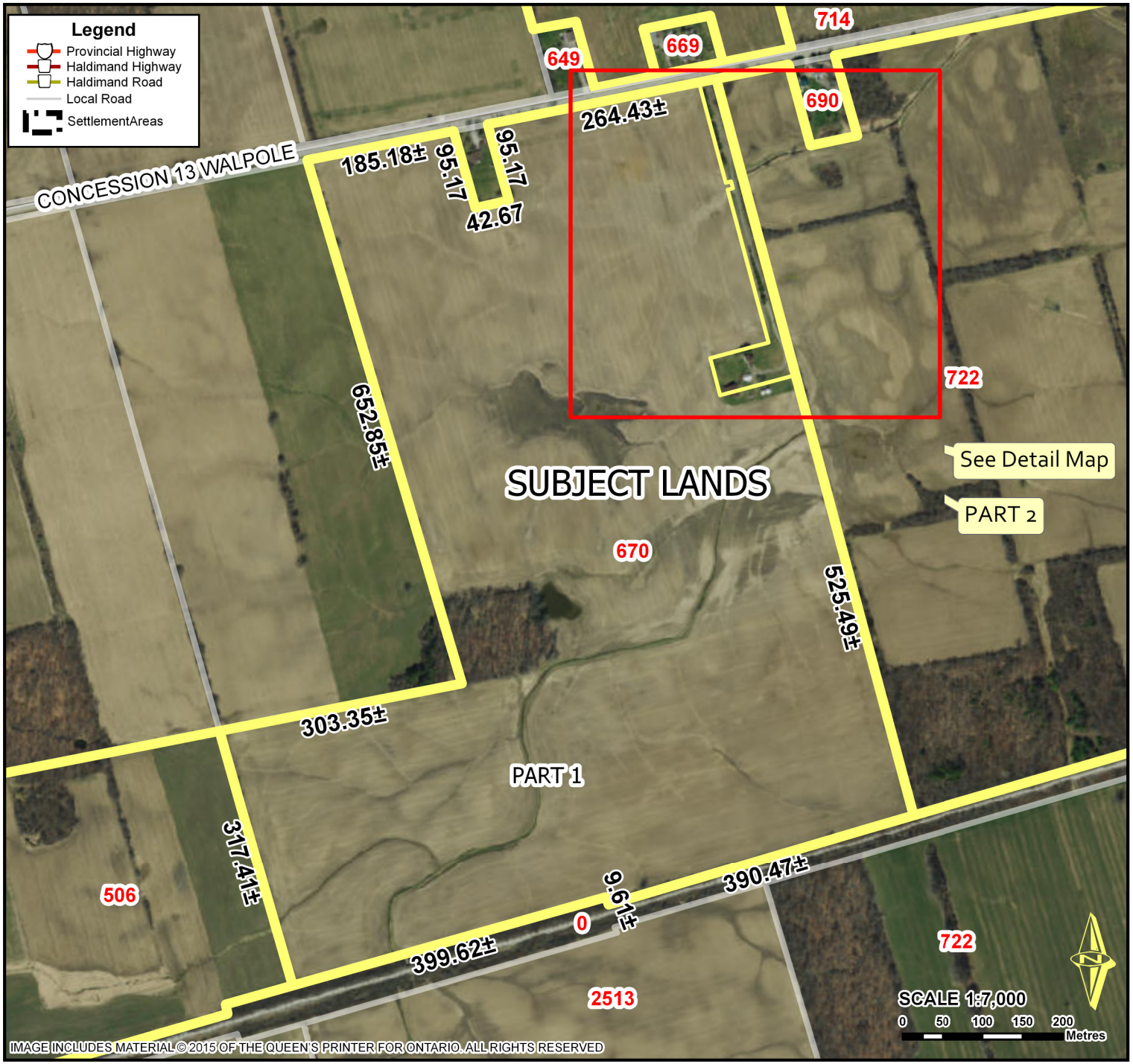
Policy: No

ATTACHMENTS:

1. General Location Map.
2. Location of Lands Affected – Owner's Sketch.
3. Draft Zoning By-law Amendment.
4. Zoning Review Chart.

Location Map FILE # PLZ-HA-2019-042 APPLICANT: 1436586 Ontario Inc.

PDD-20-2019, Attachment 1



Location:

670 CONCESSION 13
GEOGRAPHIC TOWNSHIP OF WALPOLE
WARD 1

Legal Description:

WAL CON 13 PT LOT 8

Property Assessment Number:

2810 332 006 01200 0000

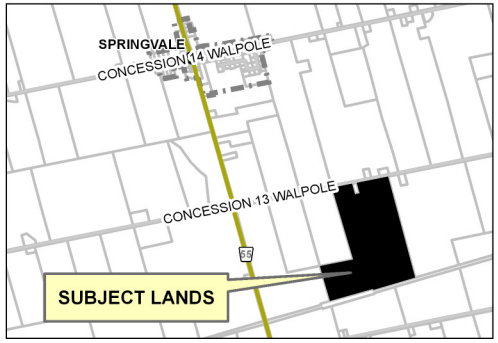
Size:

94.22 Acres

Zoning:

A (Agricultural)

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.

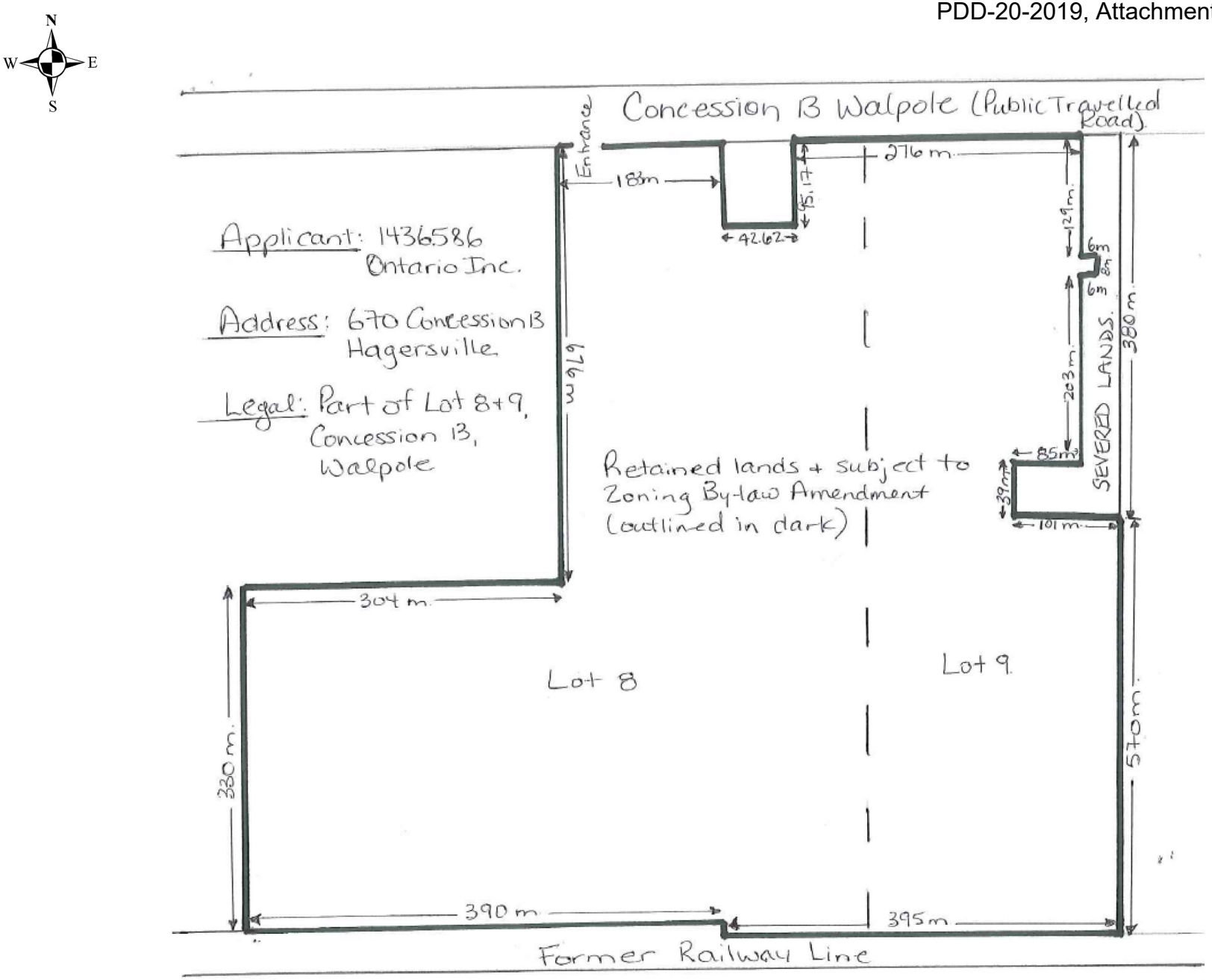


PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. Mar 2019

T:\Planning and Economic Development\PD\GIS\Applications\2019\PLZ\PLZ-HA-2019-042 (1436586 Ontario Inc.)\PLZ-HA-2019-042\PLZ-HA-2019-042.aprx

Owner's Sketch 1of2 FILE # PLZ-HA-2019-042 APPLICANT: 1436586 Ontario Inc.

PDD-20-2019, Attachment 2



PDD-20-2019, Attachment 3

THE CORPORATION OF HALDIMAND COUNTY

By-law No. /19

Being a by-law to amend Zoning By-law NE 1-2000, as amended, of the City of Nanticoke, and in the name of 1436586 Ontario Inc.

WHEREAS Haldimand County is empowered to enact this by-law, by virtue of the provisions of Section 34 of the *Planning Act*, R.S.O. 1990, C. P13, as amended;

WHEREAS this by-law conforms to the Haldimand County Official Plan;

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** this by-law shall apply to the lands described as Walpole Concession 13 Part Lot 8 Regular, and known municipally as 670 Concession 13, Walpole, and being shown as the Subject Lands on Maps “A” and “B” attached hereto to form a part of this by-law.

2. **THAT** Schedule “A1” to City of Nanticoke Zoning By-law NE-1 2000, as amended, is hereby further amended by identifying the Subject Lands which are shown as ‘Subject Lands” on Map “A” and Parts 1 and 2 on Map “B” attached hereto and forming part of this by-law, as having reference to Section 10.1.6 and 10.1.7.

3. **THAT** the following subsection shall be added to Section 10.1.6 (Special Provisions for Permitted Uses) of said By-law NE-1 2000:

#	By-law #	Address	Additional Uses Permitted	Excluded Uses
A.53 – Part 1		Walpole Concession 13 Part Lot 8 Regular, and known municipally as 670 Concession 13, Walpole		Single Detached Dwelling Housing of Livestock in Existing Barns

4. **THAT** the following subsection shall be added to Section 10.1.7 (Special Provisions for Lot and Building Requirements) of said By-law NE-1 2000:

#	By-law #	Address	Description of Special Provision
A.53 – Part 2		Walpole Concession 13 Part Lot 8 Regular, and known municipally as 670 Concession 13, Walpole	Minimum *lot frontage*: 16 metres

5. **AND THAT** this by-law shall take force and effect on the day of passing.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____

MAYOR

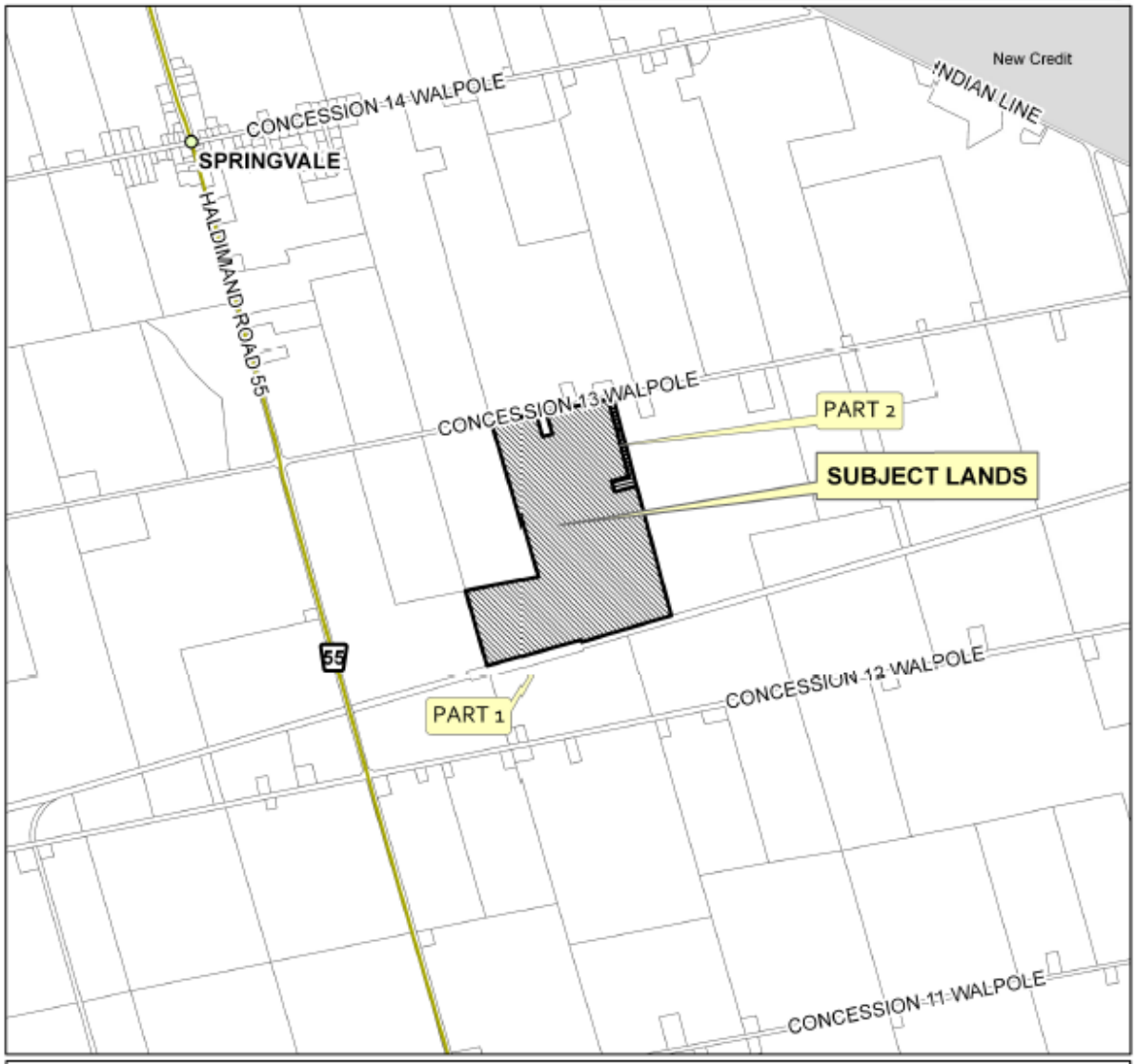
_____

CLERK

MAP A - Key Map

Haldimand County
Geographic Township of Walpole
Ward 1

0 250 500 750 1,000 Metres



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR

CLERK

Ref: PLZ-HA-2019-042

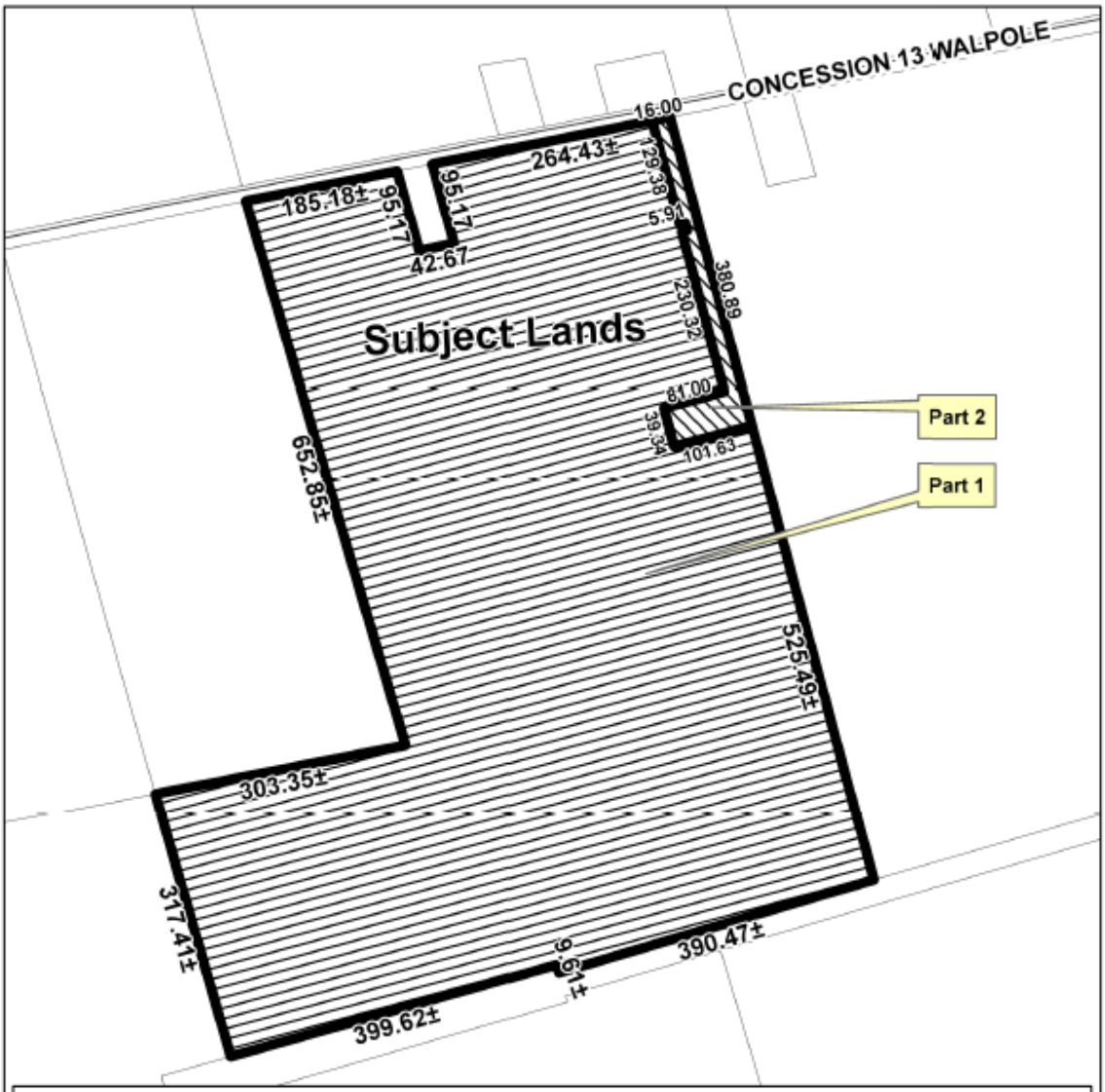
MAP B - Detail Map

Haldimand County

Geographic Township of Walpole, Ward 1

SCALE: 1:7,000

0 50 100 150 200 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considerec to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2019-042

PURPOSE AND EFFECT OF BY-LAW /19

The subject lands are legally described as: Walpole Concession 13 Part Lot 8 Regular, and known municipally as 670 Concession 13, Walpole.

The purpose of this by-law is to fulfill a condition of consent for severance application PLB-2018-132 by prohibiting future residential development and home occupations on the subject lands. Also, the proposed severed lands will have a deficiency with regards to frontage. The proposed frontage is 16 metres whereas the By-law requires 30 metres in the Agricultural zone.

In the Haldimand County Official Plan, the subject lands are designated as 'Agriculture' and there are no policy conflicts or issues as no new development is proposed.

The lands are zoned 'Agricultural (A)' in the City of Nanticoke Zoning By-law NE-1 2000 which permits uses including farm, animal kennel, farm produce grading station, storage of school buses, seasonal storage of recreational vehicles and equipment as a secondary use to a permitted farm, commercial radio, television and telecommunication towers, but excluding any office or studio associated there with, structures accessory to a mine ventilation or emergency access shaft, one airstrip and one hangar, motor homes and bunk houses for seasonal workers provided they are located on the farm on which the seasonal workers are employed, one family dwelling house, farm stand, on-farm market, farm-related processing, experiential activities and home occupation.

All of the above uses will remain permitted as-of-right except for a one family dwelling (and home occupation) which shall be prohibited on the subject lands.

Report Number:	PDD-20-2019
File Number:	PLZ-HA-2019-042
Related File:	PLB-2018-132
Name:	1436586 Ontario Inc.
Roll #:	2810-332-006-01200

Owner/Applicant: 1436586 Ontario Inc.	*Application #*: PLZ-HA 2019-042	*Assessment Roll #*: 2810-332-200-601200
Location of Property: Walpole Concession 13 Part Lot 8 Regular, and known municipally as 670 Concession 13, Walpole		
Applicable Zoning By-law: City of Nanticoke Zoning By-law NE-1 2000		*Zoning*: 'A'
Proposed Zoning Amendment: To freeze future residential development on the retained lands and recognize reduction for lot frontage		

Zoning Deficiency Chart

Development Standards ***'A' Zone*** **Part 2**	***Required***	***Proposed***	***Deficiency***
Lot Area	1,855 m²	n/a	n/a
Lot Frontage	30 m	16 m	14 m
Front Yard Setback	13 m	n/a	n/a
Exterior Side Yard	13 m	n/a	n/a
Interior Side Yard - Right	3 m	n/a	n/a
Interior Side Yard – Left	3 m	n/a	n/a
Rear Yard	13 m	n/a	n/a
Maximum Building Height	11 m	n/a	n/a
Minimum Usable Floor Area	80 m²	n/a	n/a
Parking (spaces)	2	n/a	n/a
Maximum Accessory Building Area	200 m²	n/a	n/a

HALDIMAND COUNTY

Report PDD-21-2019 Zoning By-law Amendment to Permit Commercial Uses - Baird

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To rezone the subject lands from Urban Residential Type 2 to General Commercial to increase potential for development opportunities.

RECOMMENDATIONS:

1. THAT Report PDD-21-2019 Zoning By-law Amendment to Permit Commercial Uses - Baird be received;
2. AND THAT application PLZ-HA-2019-032 to amend the Town of Haldimand Zoning By-law 1-H 86 to change the zoning of the subject property from 'Urban Residential Type 2' (R2) to 'General Commercial' (CG) be approved for reasons outlined in Report PDD-21-2019;
3. AND THAT the Zoning By-law Amendment attached to Report PDD-21-2019 to amend the Town of Haldimand Zoning By-law 1-H 86 be presented for enactment;
4. AND THAT the Removal of Holding Provision By-law attached to Report PDD-21-2019 be presented for enactment and the General Manager of Community & Development Services be granted the authority to remove the holding provision when the conditions relating to the matter are satisfactorily addressed and after public notification to neighbouring properties is provided outlining the proposed commercial site plan;
5. AND THAT the application is considered to be consistent with the Provincial Policy Statement 2014, Provincial Growth Plan 2019 or other matters of provincial interest.

Prepared by: Benjamin Kissner, Planner

Reviewed by: Mike Evers, MCIP, RPP, BES, Director of Planning and Development

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The subject proposal affects lands that are located in urban Cayuga at 21 Talbot Street East, at the intersection of Talbot Street and Thorburn Street. The proposal that has been reviewed by Planning staff is to amend the Town of Haldimand Zoning By-law 1 H-86 with respect to the subject property, such that the zoning will be changed from 'Urban Residential Type 2' (R2) to 'General Commercial' (CG) to permit a greater extent of permitted uses for the site. At this point in time, there are no definite plans with regard to the precise use or any scale of redevelopment that may occur on the site. This zoning by-law amendment is being brought forward to prepare the site for future development opportunities and once a proposal takes shape, any development at the site would be regulated by site

plan control to ensure there is appropriate design and mitigation of any off site impacts. The proposal aligns with Provincial Policy and the County Official Plan, and as such, is supported.

BACKGROUND:

The applicants propose to rezone the property to 'General Commercial' (CG), from the current zoning which is 'Urban Residential Type 2' (R2). The lands are shown in Attachments 1 and 2, and a broader perspective showing the neighbouring properties is shown in Attachment 5. This will result in a broader range of uses, that are envisioned to take place on the lands via the Community Commercial designation that is in place. There is a portion of the site that is subject to the Riverine Hazard Lands designation, however the Grand River Conservation Authority has not raised concerns though their review of this application. No buildings are proposed to be constructed at this point in time and there are no plans for a particular use at the site. Rather, the owners wish to establish a broader suite of permitted uses to make the lands more attractive and to increase opportunities for future development. In essence, the owners are 'pre-zoning' the lands for development as opposed to reacting to a specific development proposal/interest.

The subject lands have an area of approximately 0.16 hectares (0.4 acres), and front onto Talbot Street East, at the intersection of Talbot Street and Thorburn Street in the urban area of Cayuga. The lands contain an existing dwelling, and detached garage and both of these structures are used for residential purposes. These structures are proposed to remain until such time as they are no longer of use, and are recognized through a site specific provision to permit the residential use until such time as a commercial use is located at the site.

On the property directly to the north of the subject lands there is an established commercial use, in the form of a plaza including a pharmacy, bank and grocery store. To the west of the subject lands there is a County owned emergency services building and to the east and south of the subject lands are residential properties.

ANALYSIS:

Provincial Policy Statement

The Provincial Policy Statement (PPS) provides direction for municipalities to establish and support opportunities for economic development, through providing an appropriate mix and range of employment and institutional uses as well as a diversified economic base. This proposal represents an opportunity to broaden the permitted uses that are allowed for the subject lands by permitting a broad range of both commercial and institutional uses.

Further, the PPS directs that municipalities shall intensify development in places where sufficient infrastructure already exists such that expansions of road networks, or water and wastewater services are not necessary. In this instance, the subject lands have frontage to a municipal road, and there are water and wastewater services already installed across the frontage of the property. Providing a broader range of development options for the lands, gives greater opportunity to utilize this infrastructure efficiently.

Finally, the PPS directs that municipalities will ensure that new development is compatible with the existing land uses on neighbouring properties. The properties to the north of the subject lands are zoned to permit the same suite of uses as what is proposed for the subject lands. Further, the application of site plan control to the property (for all development that could take place at the site) gives opportunity to regulate various aspects of design and compatibility, including grading/drainage, landscaping, etc.

Growth Plan

The Growth Plan for the Greater Golden Horseshoe provides similar planning direction, in that economic growth be supported by directing growth to existing areas dedicated for this type of use. This land has been designated 'Community Commercial' within the Haldimand County Official Plan, and lengthening the list of permitted uses ensures that there is opportunity for a wide variety of uses to become established on the subject lands.

Haldimand County Official Plan

Policy Overview

The subject property is predominantly designated 'Community Commercial', with a portion of the site being designated 'Riverine Hazard Land' within the Haldimand County Official Plan. The Official Plan (OP) designation provided the intent that the property will over time redevelop from a residential use to a commercial use. The Community Commercial designation permits a full range of commercial uses such as: retail and service commercial facilities, business, personal and professional offices, recreation and entertainment facilities, communication and transportation services, hotels, restaurants, private clubs, government offices, community and cultural facilities and public and private institutions. This proposal has been circulated to the Grand River Conservation Authority for review, and no concerns were raised with respect to natural hazards relating to the designation.

At present, the zoning on the site is 'Urban Residential Type 2' (R2) which was placed on the property to recognize the existing residential use. By changing the zoning to General Commercial, it serves to accomplish a number of things:

- It brings the zoning into conformity with the Official Plan (and by extension, with both Provincial policy plans);
- It establishes a principle of land use that will help facilitate the goals and objectives of the Official Plan for this area (i.e. a wide range of commercial development); and
- It sets out an appropriate range of uses to better facilitate development and which can benefit from existing municipal investments in infrastructure (water and sanitary). Thus, it serves to address the OP policy relative to utilizing designated serviced lands in an efficient manner.

Land Use Compatibility

The land uses that surround the subject property are varied in nature. There are residential uses, institutional uses and commercial uses within the vicinity of the subject property. A more detailed description is provided below, and the description is illustrated by Attachment 5, which depicts the larger neighbourhood to provide a broader context.

The properties abutting the subject lands on the north, east and west are designated 'Community Commercial' as well. The property to the north has been developed as a pharmacy, bank and grocery store, the lands to the west contain a County Emergency Services building while the lands to the south and east are used for residential purposes. Staff are confident that broadening the range of permitted uses on the subject property will not introduce a land-use conflict, but rather will serve to create a consistent range of land use permissions across the area. Given the topography and constraints on the lands to the east and that the commercial designation on the subject property ends at the southerly lot line, it is anticipated that only this property has the capacity to be developed for commercial purposes.

The lands to the south of the subject property are designated 'Residential' and developed as such. The lands adjacent to those subject to this application have little buffering at this time, however once a formal development proposal is received, staff will have an opportunity to ensure that appropriate separation of the uses is established and buffering methods such as landscape/fence screening are employed where appropriate. This would be implemented through the site plan control process which is described in more detail below.

Water and Wastewater Servicing

The subject property exists within the urban boundary for Cayuga, and as such, benefits from the provision of municipal water and wastewater servicing. Servicing allocation is determined relative to a specific project and will be assessed once a development is brought forward to staff for review.

Site Plan Control

Site Plan Control is applied to a variety of zones throughout Haldimand County to regulate development. The 'General Commercial' zone is one of these zones, and as such once development is proposed for the site, staff will carry out this technical review.

As noted above, Site Plan Control is the process through which staff review the site specific, technical details relative to a particular project. Through this review staff analyze aspects of a development such as stormwater management, ingress/egress, parking layout, site lighting and buffering between land uses. This review is tailored to suit each project, and as the proponent has not provided staff with a proposed building and use at this time, a thorough site plan review has not been initiated.

Zoning By-law

The zoning on the subject property is currently 'Urban Residential Type 2' (R2), and the proponent is seeking to convert it to 'General Commercial' (CG). This will broaden the range of permitted uses to better suit the policy direction provided in the Official Plan.

At present, the 'Urban Residential Type 2' zone supports establishing a single family or two family dwelling house, which does not represent what is envisioned for the site according to the Community Commercial designation. By replacing the 'R2' zone with 'CG', the range of permitted uses will not only become more extensive, but also better align with the direction provided under the Haldimand County Official Plan, and the applicable levels of Provincial Policy.

It is important to note that the properties to the north are also zoned 'General Commercial (CG)', and lands in the vicinity are zoned 'Community Institutional' and 'Urban Residential Type 2'. It is staff's opinion that the changes proposed for the subject lands will not negatively impact the land uses that are permitted for these neighbouring lots.

The proponents are not seeking relief for any other zoning provisions relating to lot area, frontage, or yard setbacks. The subject property is large enough to satisfy the requirements of the current zone, as well as the zone that would apply should this application be approved. Staff have examined properties in the surrounding area that contain commercial uses, and the subject lands have dimensions that compare very closely to other properties with existing commercial uses. These other properties contain uses such as food establishments, a gas station and institutional uses. The subject property represents a standard lot in the context of the community, in terms of the overall area and dimensions, and for this reason staff are satisfied that potential uses for the site are not likely to be hampered by the size of the subject lands.

The lands contain an existing dwelling, and detached garage and both of these structures are used for residential purposes. These structures are proposed to remain until such time as they are no longer of use, and are proposed to be recognized through a site specific provision to permit the residential use until such time as a commercial use is located in the building. At this time, any residential use occurring on the site must comply to the zoning standard of the CG zone (up to 4 dwelling units may be permitted in the commercial building above the ground floor).

Additionally, to ensure that matters are addressed prior to development, staff are recommending that a Holding provision be placed on the property that will require the developer to address the following prior to construction: notification of details of the commercial development are provided to neighbours,

approval of a site plan and confirmation of servicing allocation. While notification to neighbours typically does not occur with site plans, it is being recommended by staff in this situation given the lack of details for a design concept (with this zoning application), the uncertain timeframe for development, potential for ownership changes and the need to ensure compatibility of development. This approach will allow for consideration of any specific site compatibility matters/concerns, but does not allow for an appeal or any veto authority. A draft by-law describing these amendments is included as Attachment 3 to this report, and staff have proposed that the General Manager of Community & Development Services receive authority to remove the Holding at such time as the requirements are met. This by-law is presented as Attachment 4.

Conclusion

Planning staff recommends that the Zoning By-law Amendment application be approved on the basis that the proposed use is consistent with the Provincial Policy Statement, 2014, conforms to the Provincial Growth Plan, 2019 and maintains the intent and purpose of the Haldimand County Official Plan and the Town of Haldimand Zoning By-law 1-H 86 with respect to the additional uses.

FINANCIAL/LEGAL IMPLICATIONS:

Not applicable.

STAKEHOLDER IMPACTS:

Emergency Services – No objections.

Planning and Development (Development and Design Technologist) – Future development may require widening or traffic improvements.

Building & Municipal Enforcement Services – No objections.

Hydro One – No comments.

Ministry of Municipal Affairs/Ministry of Housing Ontario – No comments.

Six Nations – No comments received.

Mississaugas of the Credit First Nation – No comments received.

Road Operations – No objections.

Haldimand-Norfolk Health Unit – No objections.

MPAC – No objections.

Applicant led Public Engagement Summary:

In order to satisfy the requirement for applicant led public engagement, the property owner contacted the neighbouring lots that are located immediately adjacent next to the subject lands, including residential property owners. After contacting the 4 property owners and explaining the intent of the amendment, the applicant has indicated that no concerns were raised.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

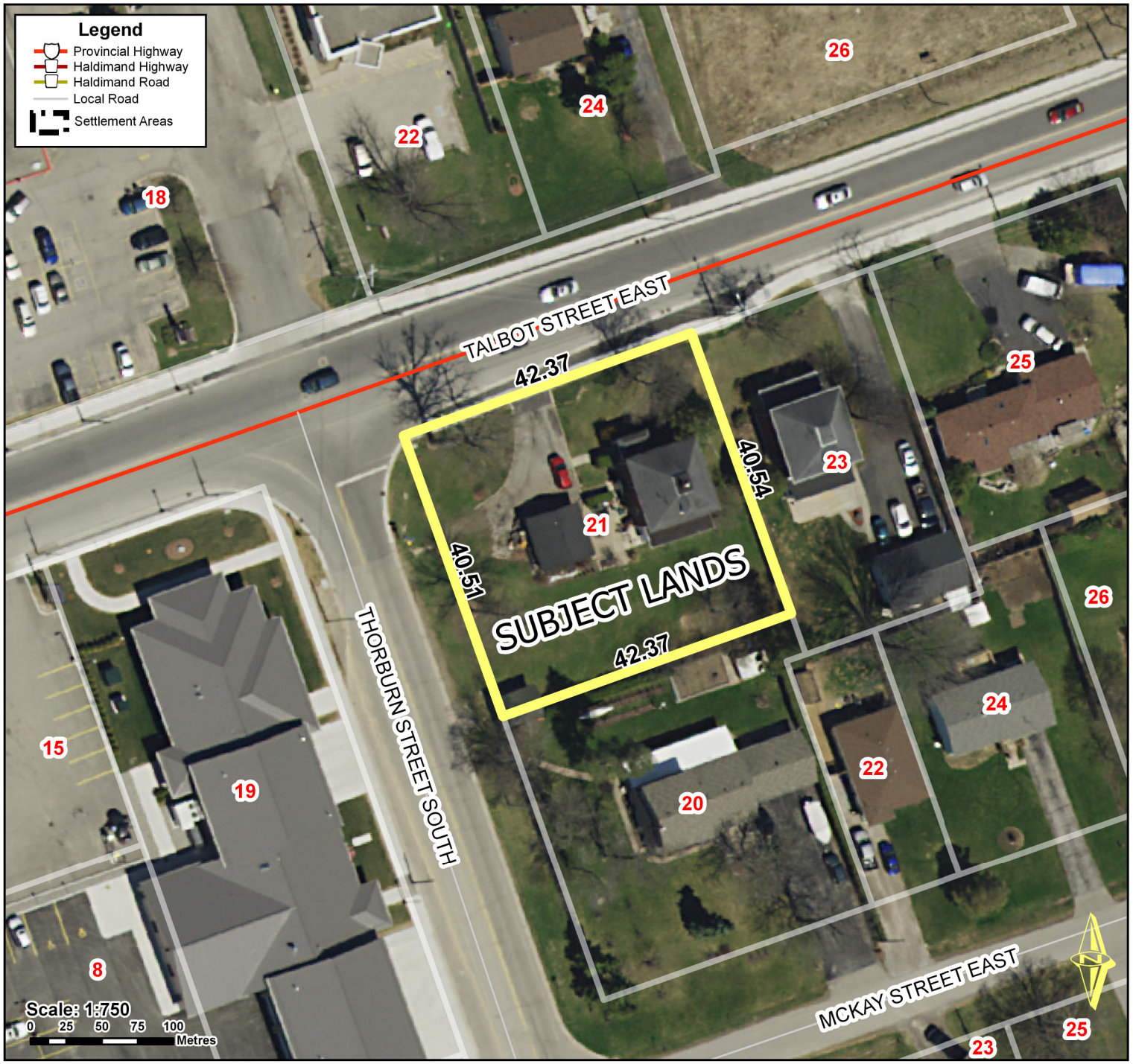
Policy: No

ATTACHMENTS:

1. Location Map.
2. Owners Sketch.
3. Zoning By-law Amendment.
4. Removal of Holding By-law.
5. Surrounding Area Map.

Location Map FILE #PLZ-HA-2019-032 APPLICANT: Baird

PDD-21-2019, Attachment 1



Location:

21 TALBOT STREET EAST
URBAN AREA OF CAYUGA
Ward 2

Legal Description:

CAY LOT 17 PT LOT 18 S TALBOT RP 18R843 PART 1

Property Assessment Number:

2810 156 001 09900 0000

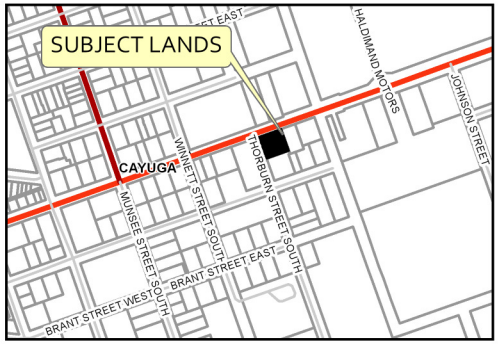
Size:

0.40 Acres

Zoning:

R2 (Urban Residential Type 2)

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.

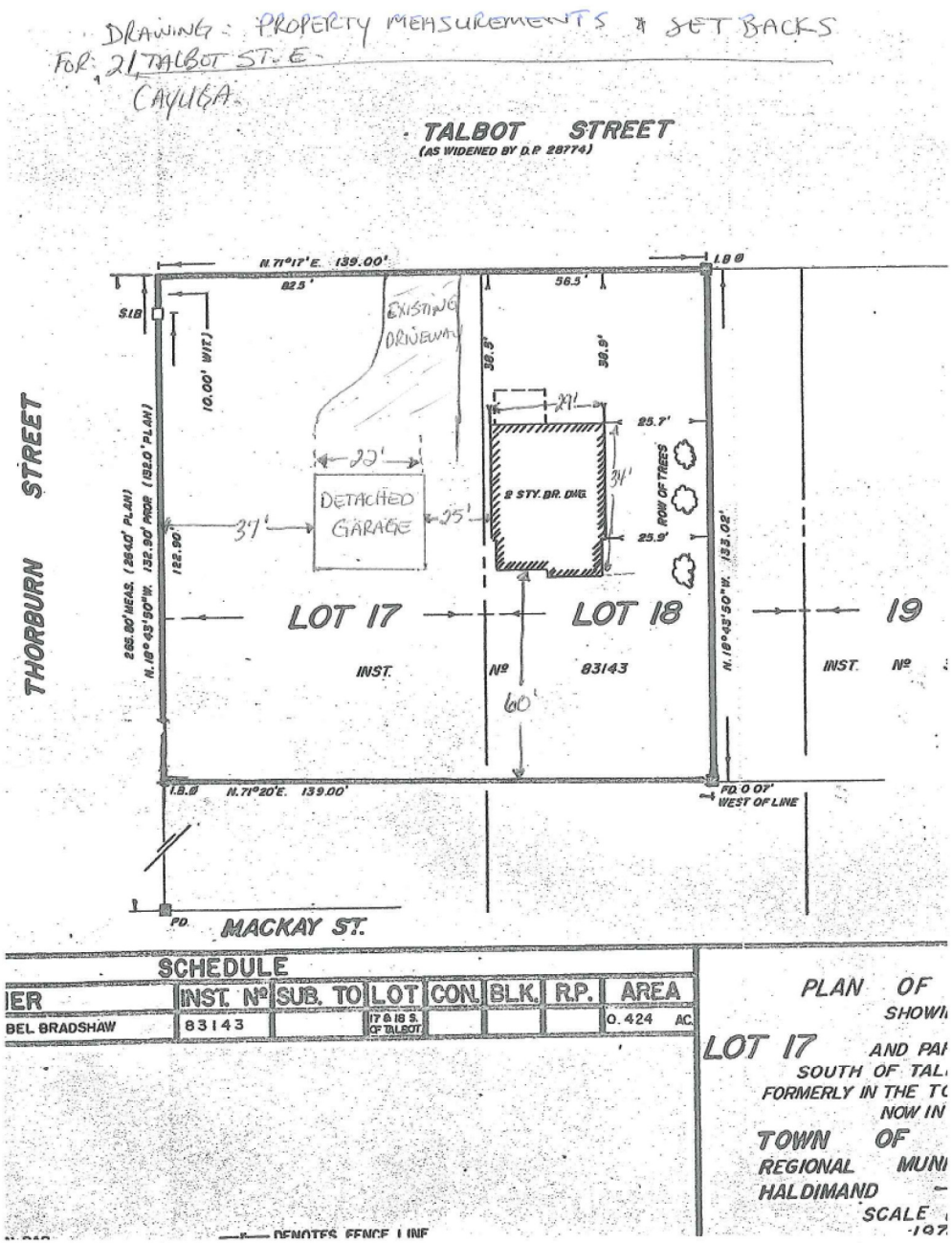


PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. Mar 2019

T:\Planning and Economic Development\PD\GIS\Applications\2019\PLZ\PLZ-HA-2019-032 (Baird)\PLZ-HA-2019-032\PLZ-HA-2019-032.aprx

Owner's Sketch FILE # PLZ-HA-2019-032 APPLICANT: Baird

PDD-21-2019, Attachment 2



THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend Zoning By-law 1-H 86, as amended, of the Town of Haldimand in the name of Scott and Carrie Baird.

WHEREAS Haldimand County is empowered to enact this by-law, by virtue of the provisions of Sections 34 and 36 of the *Planning Act*, R.S.O. 1990, C. P13, as amended;

AND WHEREAS this by-law conforms to the Haldimand County Official Plan,

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** this By-law shall apply to the lands described as Cayuga Lot 17 Part Lot 18 South Talbot RP 18R843 Part 1 Regular and being shown as the Subject Lands on Maps “A” and “B” attached hereto to form a part of this By-law.

2. **THAT** Schedule “A8” to Town of Haldimand Zoning By-law 1-H 86, as amended, is hereby further amended by rezoning the Subject Lands which are shown on Maps “A” and “B” hereto from “Urban Residential Type 2” to “General Commercial - Holding”.

3. **THAT** the following subsection be added to Section 36 of the (Special Provisions for Particular Parcels of Land) of said By-law 1 H-86:

   “36.451

   That the lands delineated as having reference to this subsection, the following provisions shall apply:

   a) Notwithstanding the provisions of Section 16.1 – permitted Uses in the ‘General Commercial (CG)’ zone, a one family dwelling house shall be permitted as an interim use on site until such time as a commercial use is established.”

4. **THAT** the ‘Holding – “H”’ provision applied to the Subject Lands, shall remain in place until such time as notification of site plan design is provided to adjacent property owners, a site plan approval process has been completed to the satisfaction of Haldimand County, and appropriate servicing capacity has been confirmed by Haldimand County for the lands subject to this By-law.

5. **AND THAT** this by-law shall take force and effect on the day of passing.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

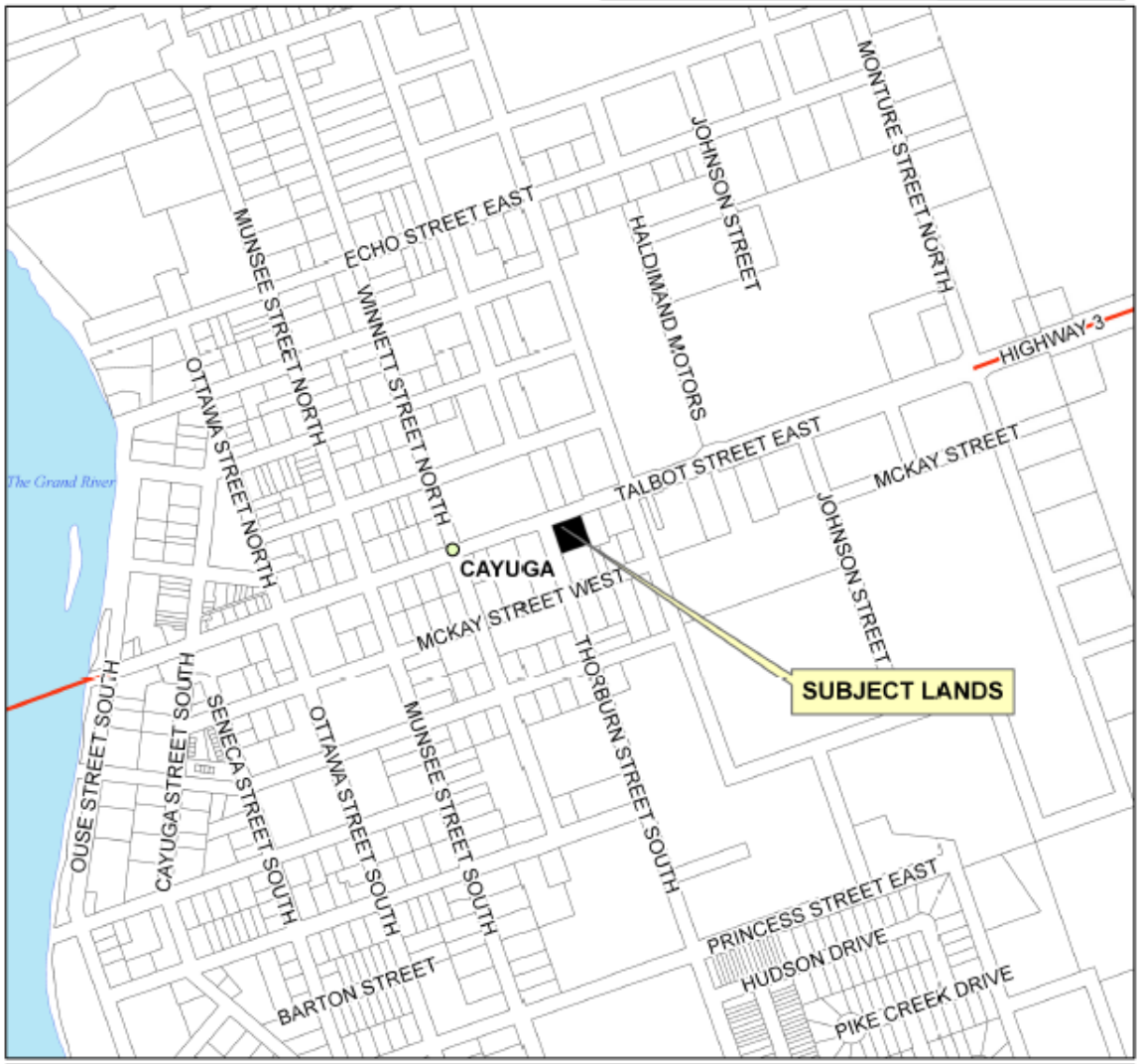
_____
CLERK

Schedule "A"

MAP A - Key Map

Haldimand County
Urban Area of Cayuga
Ward 2

0 100 200 300 400 Metres



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

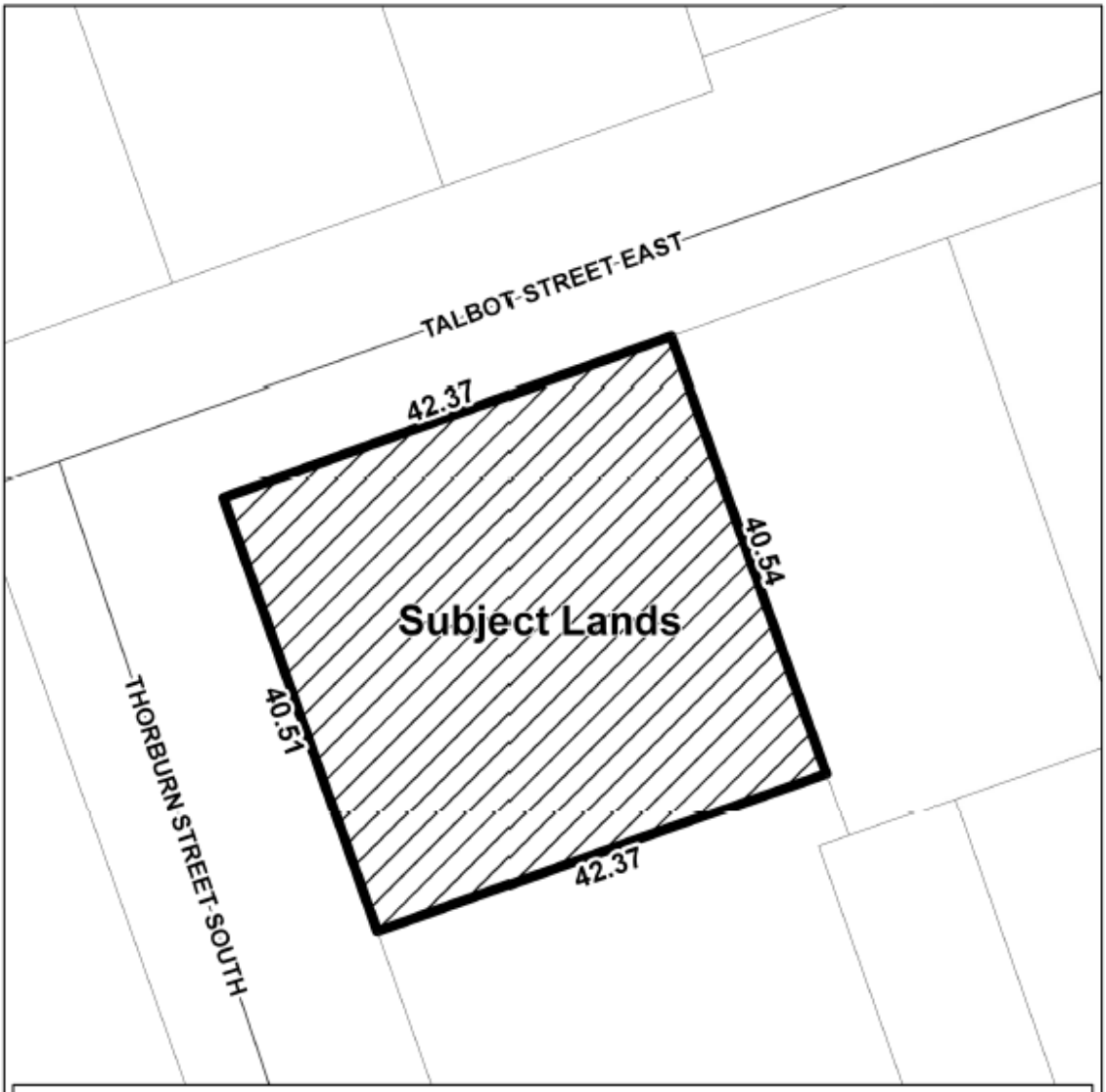
MAYOR CLERK

Ref: PLZ-HA-2019-032

MAP B - Detail Map

Haldimand County
Urban Area of Cayuga, Ward 2

SCALE: 1:500
0 5 10 15 20 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considerec to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2019-032

PURPOSE AND EFFECT OF BY-LAW /19

The subject lands are described as Cayuga Lot 17 Part Lot 18 South Talbot RP 18R843 Part 1 Regular, known municipally as 21 Talbot Street East.

The purpose of this By-law is to rezone the subject lands from R2 to CG-H to provide a broader range of permitted uses in order to increase development opportunities for the site.

In the Haldimand County Official Plan, the subject lands are designated as 'Community Commercial' and there are no policy conflicts or issues since the proposed development will conform to the provisions of CG Zone of the Town of Haldimand Zoning By-law 1-H 86. The lot itself conforms to the provisions of the CG zone, and at this point no development has been proposed as a direct result of this application. Staff note however that the residential use is proposed to continue on site in the form of the Single Family Dwelling. Staff are proposing a site specific provision that would permit the use as it exists at the time of passing, until such time as a commercial use is established. At this time, any residential component will be required to conform to the standards of the CG zone.

Staff will evaluate the technical merits of a development proposal for the site through the application of the Holding, as well as Site Plan Control which also applies.

Upon the receipt and approval of a site plan application and confirmation of servicing capacity, the 'H' Holding will be removed from the subject lands.

Report Number:	PDD-21-2019
File Number:	PLZ-HA-2019-032
Name:	Scott and Carrie Baird
Roll #:	2810-156-001-09900

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend Zoning By-law 1-H 86, as amended, of the Town of Haldimand in the name of Scott and Carrie Baird.

WHEREAS Haldimand County is empowered to enact this by-law, by virtue of the provisions of Section 34 and 36 of the *Planning Act,* R.S.O, 1990, c. P. 13, as amended;

WHEREAS this by-law conforms to the Haldimand County Official Plan;

AND WHEREAS the Council of the Corporation of Haldimand County deems it appropriate to delegate authority to the General Manager of Community and Development Services/Deputy CAO to remove a 'Holding –"H"' provision from the zoning of certain lands,

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** this by-law shall apply to the lands described as Cayuga Lot 17 Part Lot 18 South Talbot RP 18R843 Part 1 Regular, and being shown as the Subject Lands on Maps "A" and "B" attached hereto to form a part of this By-law;

2. **THAT** Schedule "A8" to the Town of Haldimand Zoning By-law 1-H 86, as amended, is hereby further amended by removing the 'Holding-"H"' provision from the subject lands being shown on Maps 'A' and 'B' attached hereto to form a part of this by-law at such time as the General Manager of Community and Development Services/Deputy CAO is satisfied that all conditions relating to the 'Holding-"H"' provision have been met and the said General Manager issues a memo to the same effect;

3. **AND THAT** this by-law shall take effect and force on the day of passing.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

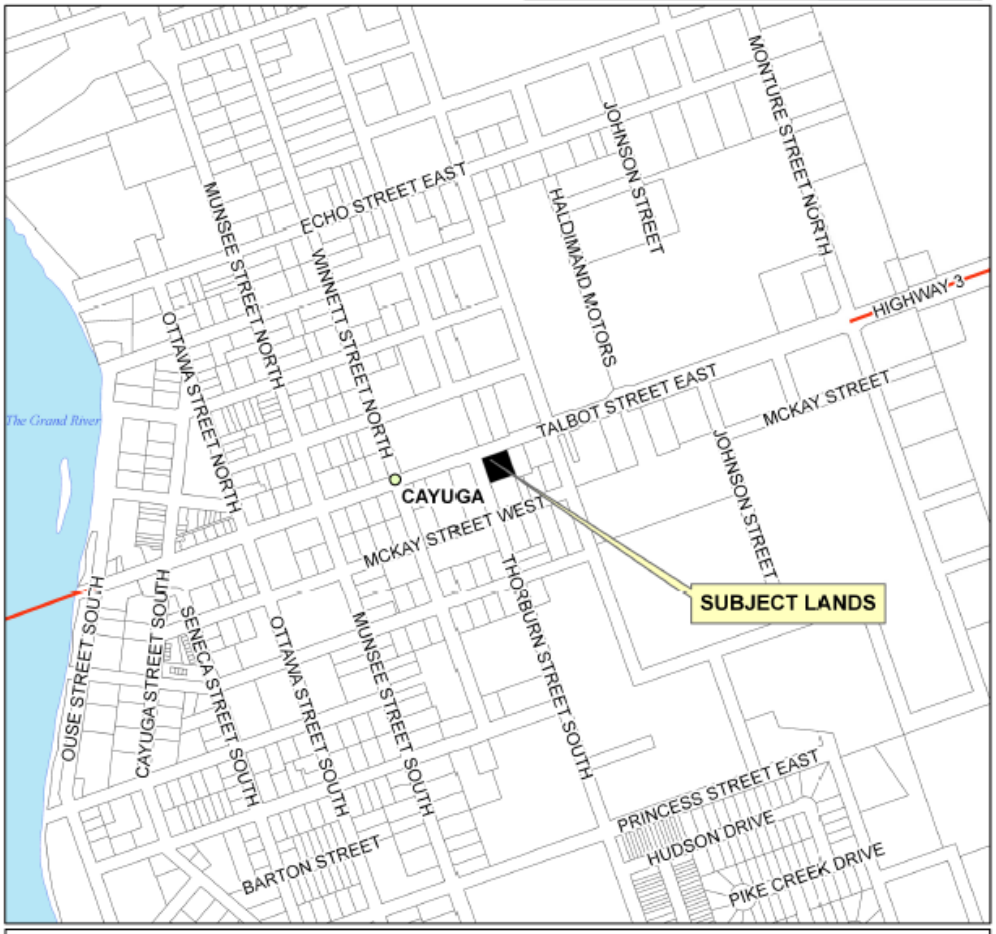
_____
CLERK

Schedule "A"

MAP A - Key Map

Haldimand County
Urban Area of Cayuga
Ward 2

0 100 200 300 400 Metres



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

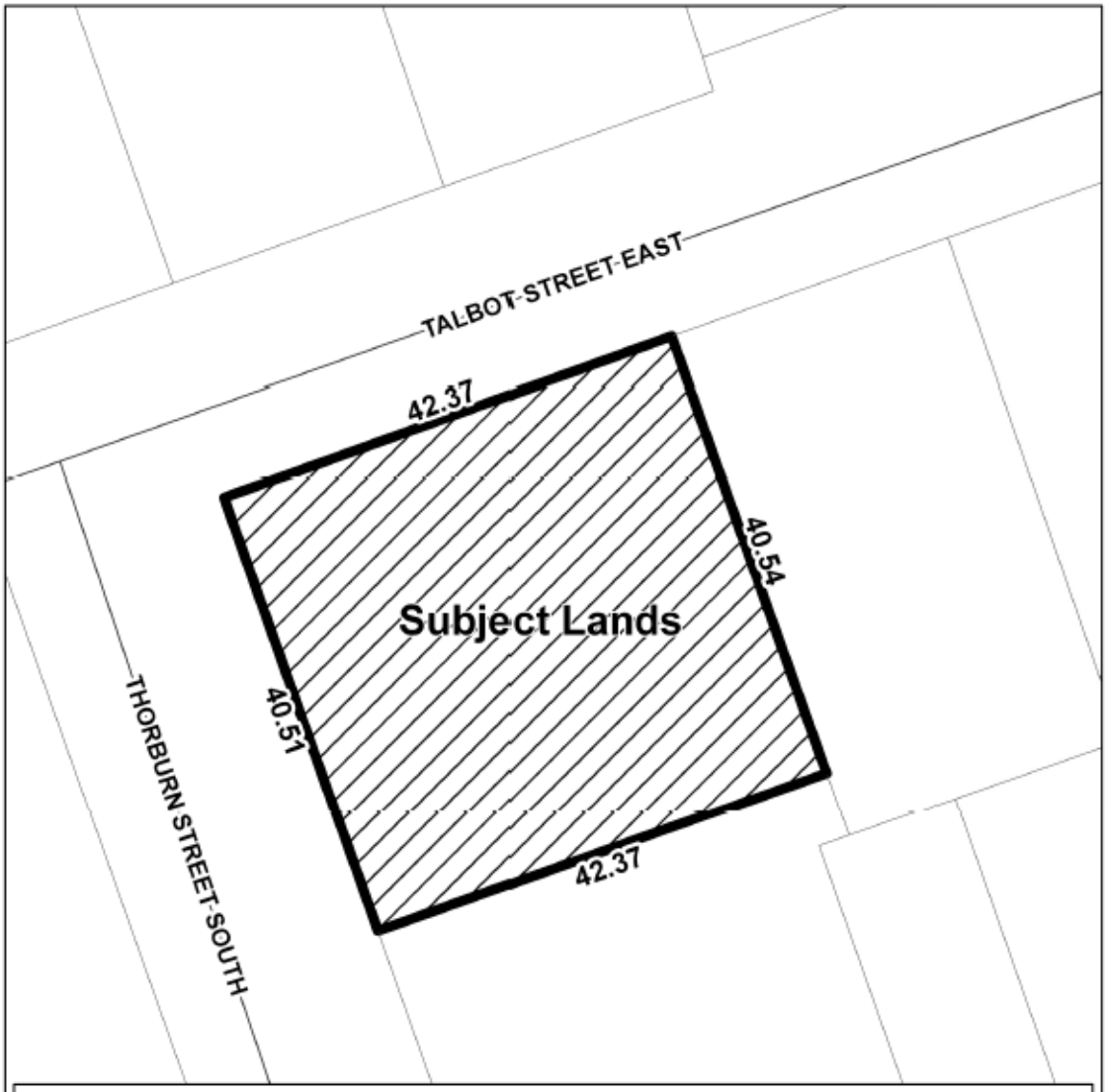
MAYOR CLERK

Ref: PLZ-HA-2019-032

MAP B - Detail Map

Haldimand County
Urban Area of Cayuga, Ward 2

SCALE: 1:500
0 5 10 15 20 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considerec to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2019-032

PURPOSE AND EFFECT OF BY-LAW /19

The subject lands are described as Cayuga Lot 17 Part Lot 18 South Talbot RP 18R843 Part 1 Regular, known municipally as 21 Talbot Street East.

The purpose of this by-law is to remove the 'Holding-"H"' provision from the subject lands at such time as the General Manager of Community and Development Services/Deputy CAO is satisfied that service allocation has been received, and final approval of a Site Plan has been obtained from Haldimand County.

Report Number:	PDD-21-2019
File Number:	PLZ-HA-2019-032
Name:	Scott and Carrie Baird
Roll #:	2810-156-001-09900

Surrounding Area Map

5/30/2019, 9:38:39 AM

Parcels

Existing Parcel

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.17 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, Esri, HERE, Garmin,

Web AppBuilder for ArcGIS

none | Esri, HERE, Garmin, iPC, NRCan | Esri, HERE, iPC, NRCan | USDA FSA, DigitalGlobe, GeoEye |

HALDIMAND COUNTY

Report PDD-22-2019 Official Plan and Zoning By-law Amendment to Permit a Millwork and Carpentry Business - Williams

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To consider an Official Plan and Zoning By-law amendment to facilitate the establishment of a millwork and carpentry business.

RECOMMENDATIONS:

1. THAT Report PDD-22-2019 Official Plan and Zoning By-law Amendment to Permit a Millwork and Carpentry Business - Williams be received;
2. AND THAT application PLOP-HA-2019-037 to amend the Haldimand County Official Plan designation of the subject lands to a site-specific 'Agricultural' designation to facilitate the establishment of a millwork and carpentry business, be approved for the reasons outlined in Report PDD-22-2019;
3. AND THAT the By-law attached to Report PDD-22-2019 to adopt the Official Plan Amendment to the Haldimand County Official Plan be presented for enactment;
4. AND THAT application PLZ-HA-2019-038 to amend the Town of Haldimand Zoning By-law 1-H 86 to add a millwork and carpentry business and associated contractor's yard to the permitted uses on the subject property through a site specific zoning provision be approved for reasons outlined in Report PDD-22-2019;
5. AND THAT the Zoning By-law Amendment attached to Report PDD-22-2019 to amend the Town of Haldimand Zoning By-law 1-H 86 be presented for enactment;
6. AND THAT the subject lands be placed under site plan control for reasons outlined in Report PDD-22-2019 and the Site Plan Control By-law attached to the report be presented for enactment;
7. AND THAT the application is considered to be consistent with the Provincial Policy Statement 2014, Provincial Growth Plan 2019 or other matters of provincial interest.

Prepared by: Benjamin Kissner, Planner

Reviewed by: Mike Evers, MCIP, RPP, BES, Director of Planning & Development

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

This official plan and zoning by-law amendment has been proposed to facilitate the establishment of a millwork business on the subject farmland that exists as a standalone use. The lands are located southwest of River Road, south of Cayuga and receive direct access from River Road. The proposed

use has been reviewed against provincial policy, which permits on-farm diversified uses and gives direction to municipalities when evaluating the suitability of a proposal of this nature, as well as directing the Planning authority to review the appropriate guidelines that have been prepared by the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA). In addition, the proposal has been evaluated against the relevant sections in the Haldimand County Official Plan, and Town of Haldimand Zoning By-law 1 H 86, and in Planning staff's opinion, is satisfied that the proposal conforms to the Provincial policies in effect, maintains the general intent of the Official Plan and applicable Zoning By-law, and that the land use is considered compatible in the context of existing surrounding development. Site specific zoning will prescribe the range and extent of the use, while site plan control will be applied to all future development. These implementing tools will ensure the use remains appropriate in its design and intensity.

BACKGROUND:

An application to amend Haldimand County's Official Plan and the Town of Haldimand Zoning By-law 1-H 86 has been received to permit a millwork and carpentry business on the subject lands shown in Attachments 1 and 2. The components of the business include: a workshop (743 square metres) and office space (232 square metres), parking area for staff to accommodate the 6 employees; the structures and parking area already exist on the site. The area to be dedicated to this business is approximately 1.4% of the site (i.e. 1 hectare of the 72.46 hectares in total). The proponents have indicated that they will continue to use the arable lands for farming, and will restrict the size of the use to what exists at present. The use, which is not agriculture-related, does not conform to the policies of the Haldimand County Official Plan as currently constituted, nor does it comply with the current value-added agriculture provisions of the Town of Haldimand Zoning By-law 1-H 86.

The subject applications were submitted following a by-law enforcement complaint that was initiated by an individual who runs a similar type of business. The complainant filed his concerns based upon a desire for all 'like' businesses to be treated equally from an approvals standpoint. The complainant's main concern was related to the fact that he was required to file planning applications to establish his business legally in another part of the County, and thus, any similar operator should be required to do same. Given the concern that competitors in the County may not be held to the same standard of review, the complaint was initiated. The County followed up on the complaint and the business subject to these applications was deemed not be in compliance with relevant policies and provisions in force and effect.

The use itself is supported by the Provincial Policy Statement (PPS), which provides policy direction to local governments in order to guide local planning documents and policy. The PPS permits on-farm diversified uses, which includes examples such as the subject proposal, however, Haldimand County's Official Plan does not presently incorporate this sort of additional use in the agricultural areas of the County. Staff will be reviewing this as part of the upcoming Official Plan update. The detailed review of the policy support for this proposal is located in the Analysis section; as a summary, the subject proposal represents a policy change that is included in a detailed manual that has been published by the Province to inform planning authorities. This manual outlines criteria that are intended to support the introduction of on-farm diversified uses (such as the subject operation) by way of setting limits on the scale that this use can achieve on the site. This manual was created to assist in achieving uniformity across the Province in terms of what can be considered as appropriate for on-farm diversified, and other agriculturally oriented, additional-use policies.

The subject property is described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular; known municipally as 1801 River Road. The property is located south of Cayuga, on the west side of River Road. The property is identified as the 'Subject Lands' on Attachment 1.

The subject lands have an area of approximately 72.46 hectares (179.06 acres) in size with direct frontage onto River Road. An aerial view of the subject lands is included as Attachments 1 and 2. The subject lands contain a dwelling, detached garage which includes office space and an agricultural structure where the workshop is located. The balance of the property exists as farm fields, natural heritage areas and manmade ponds for migratory bird habitat.

Immediately adjacent to the subject property to the east is an agricultural use and similarly the lands to the north are used for a farming operation. To the west exists the rural residential properties, and immediately south of the subject lands there are more agricultural lands.

The business operation is known as Steel City Millworks which is an established millwork and cabinetry business that provides services to institutional and commercial clients throughout Southern Ontario. The proponents established the business in 1992 on the subject lands and at that time it complied with the regulations for a home-based business. Since this time, the business has expanded to the extent to which it exists today where it employs a total of 6 people at peak production times. The subject property also sees 3-5 commercial vehicles travelling daily to the site to deliver the materials that are consumed by the business. This application has been precipitated by a By-law Enforcement issue, wherein a complaint was filed that brought the non-compliance to the attention of County staff.

It should be noted that the business type is to be classified as commercial and establishing this use at the site (through the formal approvals process) will result in an adjustment to the property taxes paid. The taxes for the property are determined based on the uses that are established on the site. Currently, the site is taxed at the rates for farm and residential uses, and calculated based on the scale of each use. Should Council approve these applications, the Municipal Property Assessment Corporation will be circulated to notify them of the additional uses being permitted, and they will determine the new tax rate for the commercial use that would be permitted on the site, which will be applied proportional to the scale of this use. In addition, the farm and residential rates will continue to be applied based on the proportions of these uses.

The purpose of the subject report is to introduce the proposal and present draft amendments to the Official Plan and Town of Haldimand Zoning By-law that would establish the principle of use as proposed by the applicant. A future implementation process of site plan control is also proposed to be established through this report in the event that the business expands beyond the capacity of the existing structures, or site works exterior to the buildings are proposed.

ANALYSIS:

The key planning issues are as follows:

Provincial Policy Statement

Planning staff has reviewed the proposal relative to the policy framework of the Provincial Policy Statement, 2014 (PPS). The subject lands are classified under a prime agricultural area within the PPS. The overall intent and purpose of the PPS is that wider prime agricultural areas shall be protected for long-term use for agriculture and that non-agricultural uses in these areas should not conflict with or compromise the ability to undertake agricultural operations. The PPS further sets out policies for Permitted Uses which includes on-farm diversified uses, which are defined as: “Uses that are secondary to the principal agricultural use of the property, and are limited in area. On-farm diversified uses include, but are not limited to, home occupations, home industries, agri-tourism uses, and uses that produce value-added agricultural products.”

The subject proposal can, in staff’s opinion, be considered an on farm diversified use. It is noted that the Province’s application and interpretation of these permissions has become more broad within the last few years with the issuance of a document entitled “Guidelines on Permitted Uses in Ontario’s

Prime Agricultural Area" (Guidelines). The Guidelines from the Province address the subject matter of this application as 'on-farm diversified'. The publication provides criteria for use considerations, including size limits of a maximum of 1 hectare (or 2% of land area) which keeps the scale of use in check. Further it provides lists and ranges of uses that can and cannot be considered – included in the 'cannot' category are things such as manufacturing plants, high water/sewer users, warehousing/distribution centres, large food processors, significant traffic generators, institutional uses (church, school, nursing homes), and recreational facilities (golf courses, arenas, etc.). Included in the 'can' category is woodworking, such as the millwork/cabinetry use subject to this application. The last point to note is that Ministry of Municipal Affairs staff reviewed this application in the context of the Guidelines and agreed that this is the type of use/situation that the Guidelines and Provincial policy support. A final note in that regard is that the uses now supported (by Provincial policy) go beyond what is reflected in the County's Official Plan. That is a key aspect and driver of the Official Plan amendment portion of this application.

The relevant policy (for on farm diversified uses) as described above is presented in section 2.3.3.1 of the PPS, which provides direction that uses: "Shall be compatible with, and shall not hinder, surrounding agricultural operations. Criteria for these uses may be based on guidelines developed by the Province or municipal approaches, as set out in municipal planning documents, which achieve the same objectives". At this time the Haldimand County Official Plan does not contain policies that address this sort of use, thus staff have utilized the guidelines that have been produced by the Ontario Ministry of Agriculture, Food and Rural Affairs, to assist in determining the suitability of the subject proposal as an on-farm diversified use. An analysis of those criteria is included below:

i. The use must be located on a farm that is actively in agricultural use;

Planning Comment:

The property is principally agricultural, with lands being actively farmed as an agricultural use. The proposed on-farm diversified use, which occupies less than 2% of the subject property, is clearly secondary to the farm operation. Calculations are shown below (Test 3).

ii. The use is secondary to the principal agricultural use of the property;

Planning Comment:

The on-farm diversified use is secondary to the principal agricultural use of the property, both by area calculation and applicant's intent. The lands that make up the balance of the property include an area of 27.3 hectares (60 acres) that is currently, and will remain as cropland. In addition, there are 42.63 hectares (113.2 acres) of natural heritage land, which also will not be affected by the amendments requested by these applications.

iii. The use is limited in area;

Planning Comment:

The total size of the property is approximately 72.46 hectares (179.06 acres), comprising of the following uses:

- Carpentry Business (the subject of this application) = 1.03 ha (2.55 ac or 1.4%)
- Residential = 1.5 ha (3.3 ac)
- Crop Lands = 27.3 ha (60.0 ac)
- Natural Heritage = 42.63 ha (113.2 ac)

Steel City Millwork is identified as occupying 1.4% of the total property area and will be limited in future growth by a Site Plan and through proposed zoning regulations (see zoning section below). No new buildings are proposed with this application. The Province's guidelines for on-

farm diversified use identify a maximum usage of 2% for any such use. The proposal aligns with that guideline.

iv. The use includes, but is not limited to: home occupations, home industries, agri-tourism uses and uses that produce value added agricultural products. Other uses may also be suitable, subject to meeting all PPS criteria; and

Planning Comment:

When the use was established on the site in 1992, it was of a scale that was supported as a Home Industry which is permitted as-of-right in the policies of the Official Plan and the provisions of the Zoning By-law. Since that time, the use has grown to keep up with demand and meet the requirements of the market that it competes in. As a result of this demand, the use has grown to a point where it exceeds what is permitted as a Home Industry (approximately 4 times the size). While the owner still lives on the site, the size of the operation is beyond what would typically qualify as a Home Industry. With that said, the scale of the use, in the context of the site and surrounding area, remains appropriate in the view of staff. Further, this proposal qualifies as a type of use that falls under the category of 'Other Use' (per PPS) that is suitable and meets all the locational criteria.

v. The use shall be compatible with, and shall not hinder, surrounding agricultural operations.

Planning Comment:

There is no evidence that Steel City Millwork (SCM) hinders the surrounding agricultural operations on the property. However, the proposed business will include landscaping both at the road, along the laneway and at the front perimeter of the building itself to minimize any potential issues. In addition, the existing farming operation will remain and the business will operate during weekday daylight hours only, to minimize possible impacts on the surrounding operations. Overall, the proposed use represents a size and appearance that is not unlike agriculture or agriculture related structures in the surrounding area. Uses of this nature, albeit typically of a smaller scale, can be found throughout Haldimand County in the agricultural areas where they are of a size that conforms to the standards of a Home Industry.

Furthermore, the PPS sets out criteria (Policy 2.3.6.1 (b)) relating to circumstances in which land may be excluded from a prime agricultural area for limited non-residential uses. An analysis of those criteria is included below:

i. The land does not comprise a specialty crop area;

Planning Comment:

The subject lands do not comprise a specialty crop area, and the soils in the area affected by the official plan and zoning by-law amendment are further constrained since they have been built upon and subject to a use that has been located here for a lengthy amount of time (in smaller form since 1992, current building since 2013). The soil has been subject to compaction and surface treatment (gravelling) for a period of time, it is staff's opinion that the soil quality in the area subject to the official plan and zoning by-law amendment has been reduced beyond the original rating. The classification of the subject lands is consistent with the typical composition of the area.

ii. The proposed use complies with the Minimum Distance Separation (MDS) formulae;

Planning Comment:

The MDS Formulae is a land use planning tool that establishes a recommended separation distance between a livestock barn and/or manure storage facility and another land use. The overall objective of the MDS formulae is to prevent land use conflicts and minimize nuisance

complaints from odour. The intent of this proposal is to establish an additional use on the subject lands. The proposed use is commercial in nature and is not classified as a sensitive land use, thus the setbacks required under the MDS guidelines do not apply.

iii. There is a demonstrated need within the planning horizon provided for in (Policy 1.1.2) for additional land to be designated to accommodate the proposed use; and

Planning Comment:

Policy 1.1.2 of the PPS sets out that sufficient land shall be made available through intensification and redevelopment, and if necessary designated growth areas, to accommodate an appropriate range and mix of land use opportunities to meet projected needs for a time horizon of up to 20 years.

Generally speaking, Haldimand County has a sufficient designated employment land supply available to meet the projected needs over the next 20 years. The current proposal began as a legitimate Home Industry and was permitted as-of right, but has grown beyond the current standards. The use is now well established and has become a fixture in the landscape with negligible impacts on surrounding lands. These amendments are intended to recognize what is there, and not to establish a new operation on the site or support an expansion to what exists. The use will be capped at its current size to ensure that it maintains an appropriate scale for the area. Should the business need to grow in future, the applicant will review operations and determine which parts of it can be relocated to a new, serviced location.

This site is suitable to accommodate the proposed uses in terms of size and capabilities, and as such, justifies this additional land being designated to accommodate the proposed use.

iv. Alternative locations have been evaluated, and:

a) There are no reasonable alternative locations which avoid prime agriculture areas.

b) There are no reasonable alternative locations in prime agricultural areas with lower priority agricultural lands.

Planning Comment:

Haldimand County considers all agricultural lands, other than lands that do not form part of a settlement area (i.e. hamlet, urban area and resort residential node), as prime agricultural land. The majority of the soil class for Haldimand County ranges between Class 2 to 4, moderate to severe limitations and, the soil classification on the subject lands is Class 3 or 5 soils, which is consistent with adjacent lands to the north, south, east and west. Alternative locations have not been sought nor evaluated for this on-farm diversified use. The initial operation of the business being secondary to the farm has been successful and harmonious to date, although as Steel City Millwork has increased its production to its current identified limit. When an expansion to the business is deemed necessary, alternative locations for Steel City Millwork will then be considered, including moving portions of the operation as required to a suitable location in a settlement area. The majority of the farm parcel will be left intact, and the arable lands are not indicated to be impacted by the proposal.

Provincial Growth Plan, 2019

The Provincial Growth Plan sets out a policy framework that guides development in a compact and vibrant manner, with emphasis on building complete communities while also optimizing the use of existing and new infrastructure to support growth in a compact and efficient form. As the subject lands are considered to be within the prime agricultural area, efforts are to be taken to ensure that the resource is protected for the long-term economic prosperity, quality of life and environmental health.

Staff have worked with the proponents to determine the amount of land that is required to establish the uses that they desire, while leaving the largest amount of farmland possible unaltered for agricultural uses into the future. Given this approach, plus the fact that no new buildings are being proposed, staff is satisfied that the intent of this aspect of the Growth Plan is not offended.

The Provincial Growth Plan also speaks to the need to provide for an adequate supply of lands for a variety of appropriate employment uses, and that municipalities are to promote economic development and competitiveness. Planned employment areas and lands are identified within the County, but are generally identified as vacant land intended for new developments. The proposed amendments will permit the millwork business at its current scale on the subject lands. This proposal will also ultimately provide an economic opportunity by allowing an existing business within the County to exist at a location where it was established, and has been expanded over time. These applications will provide an opportunity to continue to create a diverse economic base and take into consideration the needs of the operation. As such, the proposal is considered to be in conformity with the Provincial Growth Plan.

Haldimand County Official Plan

The subject lands are designated 'Agriculture' within the Haldimand County Official Plan. Within the 'Agriculture' designation, the land base is to be protected and the use of the lands must be predominately agriculturally oriented. Permitted uses include all forms of farming, as well as land uses compatible with or related to agriculture, including value added uses, secondary uses and agriculturally related uses. The proposal includes a request to consider a use that is not listed previously, and is considered to be an on-farm diversified use – something that is not spoken to in the Official Plan at present but will be addressed as the County embarks upon its Official Plan update starting this year. Given the applicant's need to address the land use permissions issue (stemming from the by-law enforcement complaint), the application must be advanced at this time and cannot wait for the Official Plan to be updated.

As noted earlier in the report, the use was initially established as a home industry. Staff have reviewed the current version of the proposal against the policies contained in Section 5.j.1 of the Official Plan as they relate to home based businesses (which includes home industry), and it is the opinion of staff that the proposed use does not conform to this section. This is due to the scale of the use exceeding what is permitted for a home industry - i.e. up to 25% of the gross floor area up to a maximum of 50 square metres. The use is well in excess of the 50 square metre cap, between completely occupying the accessory structure as well as a portion of the detached garage. As well, the people employed by the use are not restricted to those living on the property, as is the direction of the policies in this section of the Official Plan. There are 6 off-site employees. The fact this use goes beyond the initial home industry classification further creates the need for the Official Plan Amendment.

Land Use Compatibility

Where a new use is proposed on lands which abut a sensitive land use (i.e. in this case a residential dwelling), a compatibility review must be undertaken to ensure the appropriateness of the development and potential for mitigation measures. In this instance the sensitive land use is located to the east of the lands where the proposed amendments are to affect. The property line for the residential lot is located approximately 125 metres from the nearest structure where the proposed use is to be located. The house is setback approximately an additional 90 metres from the nearest lot line where the amendments are to occur. These measurements total to a setback of 215 metres from the nearest barn included in the amendments. The review and measures that need to be addressed include the following:

i. separation of uses by increased setbacks;

Planning Comment:

The intent of this proposal is to establish permissions to use existing structures on site, and no new construction is proposed at this time. As the lands will be subject to site plan control for the future, any new development on the site and the final details of those designs, will be reviewed and further mitigation measures as may be deemed necessary, can be included as part of the site plan approval process. The review would include the location and orientation of buildings, orientation of use, grading and drainage, landscaping, vehicular movements and parking.

ii. screening and buffering such as landscape strips, architectural screenings, fences or berms;

Planning Comment:

At present, the subject lands benefit from natural features such as the distances between the subject use and any potential receptors (the nearest being approximately 210 metres), buffering provided by the treeline to the south, and general topography of the area. Site Plan Control will be employed to ensure that if concerns arise as a result of future site works, they can be mitigated using site design criteria which will be utilized where needed.

iii. location of lighting so that it is deflected away or shielded from adjacent sensitive uses;

Planning Comment:

Any lighting installations would be assessed via photometrics plan and mitigation of light spillage, and will be part of any site plan approvals. At present, staff are not aware of any lighting installations existing on the site. As noted above, the nearest potential receptor is located approximately 210 metres away and separated by natural features such as a treeline and topography. In the future, a photometrics plan would be required at the site plan review stage, if a site plan application is deemed to be required.

iv. proper location of parking, loading and unloading areas, and outside storage; and

Planning Comment:

The gross floor area of both buildings included in this application is approximately 975 square metres in size. The office component will occupy an area of 232 square metres in the detached garage which is also subject to these amendments. The remaining 743 square metres of floor area is dedicated to the workshop for the business. There is adequate space on the site to accommodate parking for employees. A maximum of 6 would be required and there is a supply greater than that available. Additionally, there is sufficient space on site to accommodate safe loading and unloading of vehicles and equipment.

v. provision of safe, convenient pedestrian access with minimal interference from vehicular movement.

Planning Comment:

In terms of parking location, customer parking is proposed to be located on the existing gravelled area. The proponents note that the customer traffic to the site is quite limited, and the majority of the people who attend the property are employees.

Another consideration of this proposal as it relates to compatibility is the aspect of traffic. The applicant has indicated that the hours of operation will be during standard business hours of 9-5, Monday to Friday, and that the majority of their business will be occurring off-site. As such, the majority of the traffic will occur at times of the day when people would be commuting to and from work, school, etc. with limited activity occurring throughout the day. The proponents note that on average 3-5 deliveries of materials and supplies occurs to the premise per day, and are delivered directly to the workshop.

Based on the policy framework, Planning staff are of the opinion that this amendment is considered appropriate and will serve to maintain the general intent of the Haldimand County Official Plan by permitting a use on the site that will not have a negative impact on the surrounding land uses, and also, provides a service and benefit to some of those within the agricultural/rural community.

Town of Haldimand Zoning By-law 1-H-86

The subject lands are currently zoned “Agricultural (A)”. The intent of the subject proposal is to establish a site specific zoning provision on the subject lands to permit a millwork business on the subject lands subject to the restrictions described below.

Planning staff are of the opinion that establishment of this additional use is appropriate. More specifically, the type of use is generally commercial in nature, with some of the services taking place off site, so there is a limit to the intensity and potential impact of the additional use to surrounding land uses. The subject lands also provide an opportunity to continue to house a business that has existed in the County since 1992, and provides employment for six individuals.

To ensure that the scale, layout and approach to development is appropriate, a series of special zoning provisions are proposed as follows:

- Carpentry workshop and storage uses will be limited to a maximum area of 743 square metres which houses the current workshop portion of the business;
- A related management office shall be limited to a maximum of 232 square metres, this floor area represents the current size of the management office;
- Cap the number of employees at six (6) which has been identified by the owners as the number of people employed during peak demand; and
- Open storage shall be prohibited in the required front yard.

These provisions would apply to the lands identified in the mapping associated with Attachment 4. The collection of these special provisions will ensure that the use is regulated appropriately and remains small in scale with appropriate land use separations. These regulations apply and will be used in the future if site works are proposed. Any deviation from the above, including expansion to the operation, would require a future application, public process and Council consideration.

Overall, the proposal is appropriate as the proposed use is generally in keeping with the intent of the Zoning By-law and represents an opportunity to create a new commercial opportunity within the County.

Site Plan Control

As noted previously in this report, any future development of the subject lands will be subjected to site plan review and approval from the County. As the subject lands are within an Agricultural (A) zone, a site plan control by-law must be passed by Council given that the ‘A’ zone is exempt from the site plan control process. The site plan control by-law is attached to this report at Attachment 5.

Draft Amendments

Copies of the proposed draft Official Plan amendment (Attachment 3), and a Zoning By-law amendment (Attachment 4) have been prepared and attached to this report. With the approval of the requested Official Plan and Zoning amendment, the proposed development on the subject lands will have a new site specific policy added to the site and the Zoning By-law will have an added site specific zoning provision.

Planning Opinion:

Planning staff has reviewed the proposal in relation to Provincial and County policy frameworks and are of the opinion that the proposed amendments are consistent with and generally maintain the intent and purpose of the Provincial Policy Statement, 2014, the Places to Grow Plan and the Haldimand

County Official Plan. Additionally, the proposed amendment to the Zoning By-law maintains the intent and purpose of the Town of Haldimand Zoning By-law 1 H 86. Therefore, Planning staff is supportive of the subject applications.

The proponents have sent notice to the neighbours within 120 metres of the subject property and hosted an open house on May 16th, 2019. The following points were raised during the meeting by the attendees:

- Supportive of the business on the site.
- Disappointed that the County is pursuing this as a by-law issue.
- Disappointed that permission is required to continue operating, as it is.

Planning Comment:

The recently implemented policy interpretations that have been provided by the province are not yet reflected in the Haldimand County Official Plan, and will be assessed as part of the forthcoming Official Plan update process. The subject proposal proceeding at this time, needs to receive policy support, as it is not covered by County policy at this time and thus the application is required. Staff do support the applications due to the clarified application/interpretation of Provincial Policy, by the Province.

FINANCIAL/LEGAL IMPLICATIONS:

Not applicable.

STAKEHOLDER IMPACTS:

Ministry of Municipal Affairs/Ministry of Housing Ontario – No objections.

Emergency Services – No objections.

Planning and Development (Development and Design) – No objections.

Building & Municipal Enforcement Service – No objections.

Hydro One – No objections.

Six Nations – No comments received.

Mississaugas of the Credit First Nation – No comments received.

Road Operations – No objections.

Haldimand-Norfolk Health Unit – No objections.

MPAC – No objections.

Other – No objections to the proposal have been received from any other agency or member of the public.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

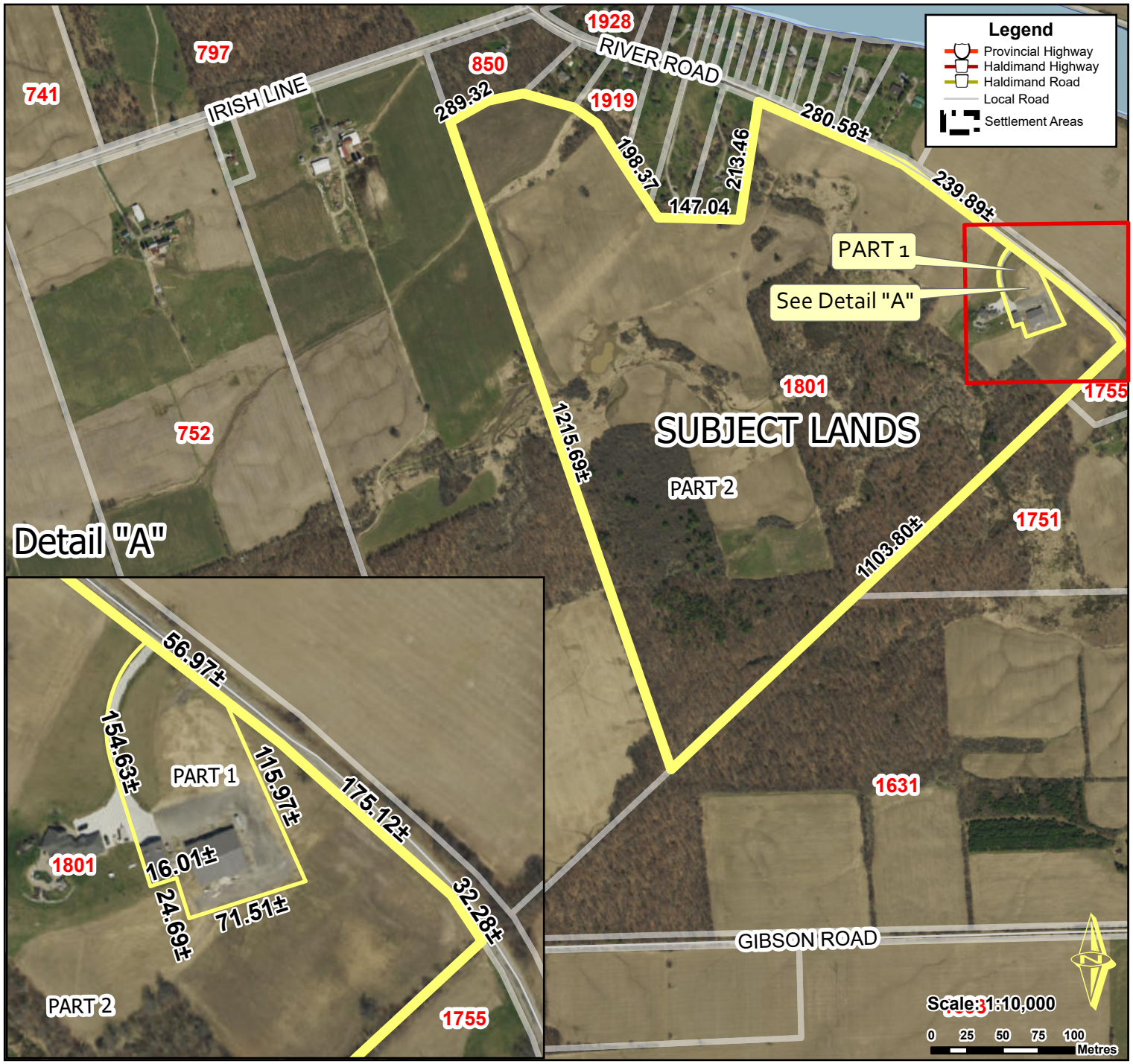
Policy: No

ATTACHMENTS:

1. Location Map.
2. Owner’s Sketch.
3. Official Plan Amendment By-law.
4. Zoning By-law Amendment.
5. Site Plan Control By-law.

Location Map FILE #PLOP-HA-2019-037 & PLZ-HA-2019-038 APPLICANT: Williams

PDD-22-2019, Attachment 1



Location:

1801 RIVER ROAD
GEOGRAPHIC TOWNSHIP OF NORTH CAYUGA
Ward 2

Legal Description:

NCAY CON 2 STR PT LOTS 30 TO 32

Property Assessment Number:

2810 155 002 04070 0000

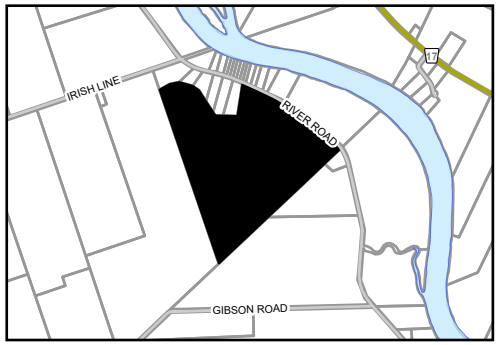
Size:

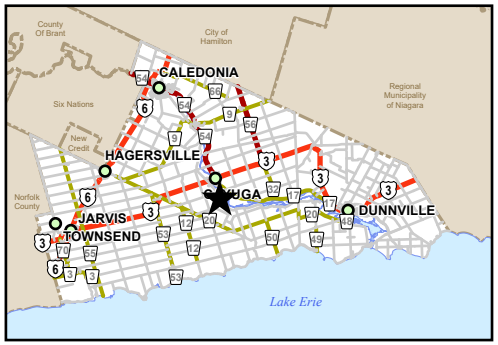
191.00 Acres

Zoning:

A (Agricultural) & HL (Hazard Lands)

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.



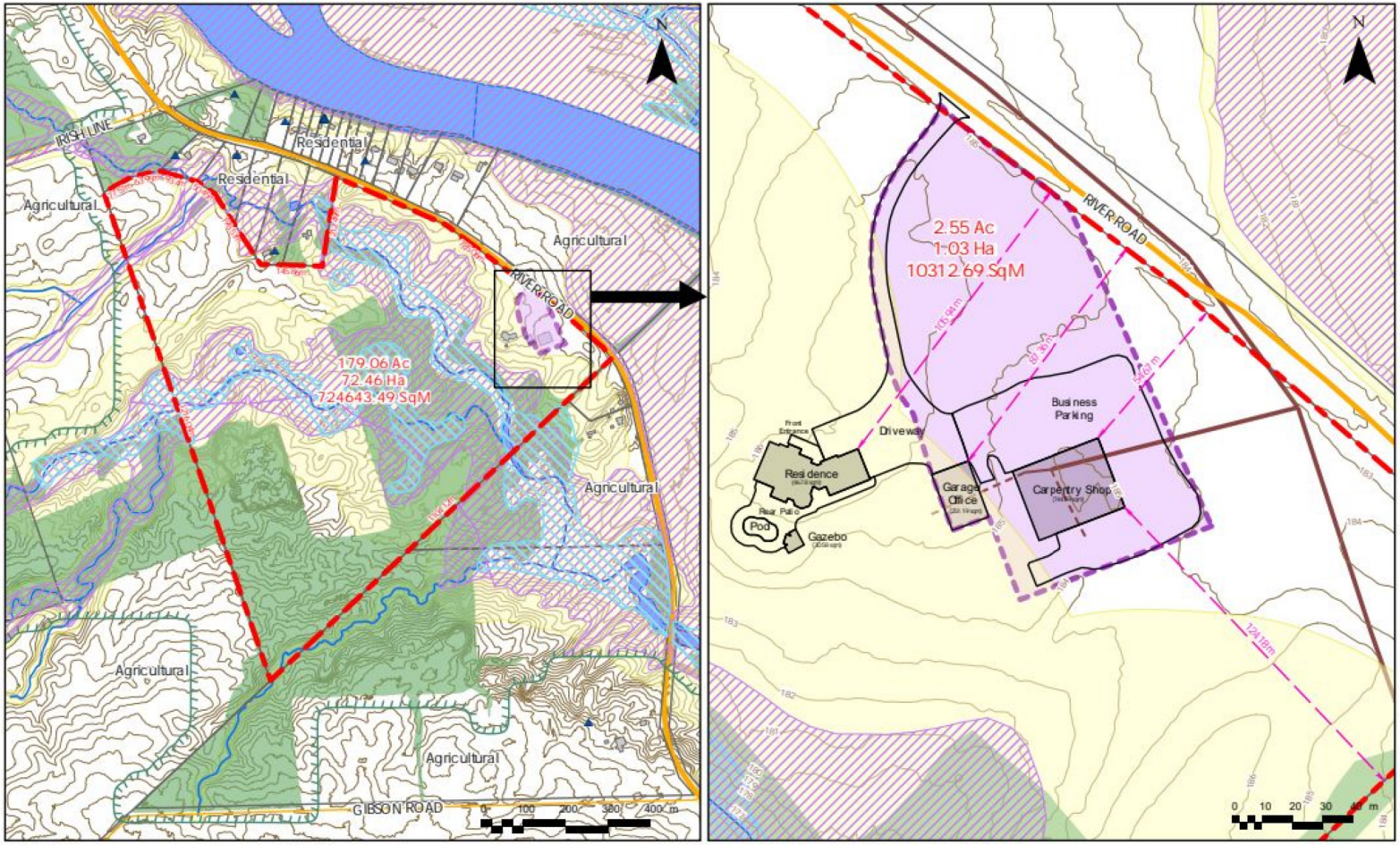


PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. Mar 2019

T:\Planning and Economic Development\PD\GIS\Applications\2019\PLOP\PLOP-HA-2019-037 & PLZ-HA-2019-038 - Williams\PLOPHA2019037PLZHA2019038\PLOPHA2019037PLZHA2019038.aprx

Owner's Sketch 1of2 FILE #PLOP-HA-2019-037 & PLZ-HA-2019-038 APPLICANT: Williams

PDD-22-2019, Attachment 2



WILLIAMS

Key Map

Legend

- 1801 River Rd Property Boundary
- Proposed On Farm Diversified Uses
- Parcels
- Building Footprint
- Elevation Contour
- Woodlots
- Road Service Class 4
- Road Service Class 6
- Regulatory Floodplain
- Wetland
- Waterbody
- Watercourse
- Regulation Limit
- Natural Heritage System
- Hydro Primary Lines
- Hydro Secondary Lines
- Secondary Underground Hydro
- Wells

Notes:
1.0 Hydro Lines, Building Footprints, Parcel Boundaries, Roads, Hydro Lines, Woodlot - Contains information licensed under the Open Government License - Haldimand County
2.0 Elevation Contours, Wetlands, Regulatory Floodplain, Waterbody, Watercourses, Regulation Limit - Contains information made available under Grand River Conservation Authority's Open Data License v1.0
3.0 Natural Heritage System, Wells - Contains information licensed under the Open Government License - Ontario.

F:\WILLIAMS (Individual)\4. Graphics\GIS\02_Analysis\ProWilliams_1801RiverRd_GISDataCompilation_20190228.aprx < > 2019.02.28 11:20 AM

Conceptual Site Plan

1801 River Road, Haldimand, ON

LARKIN+ land use planners inc.

849 Gorham Street
Newmarket, ON
Canada L3Y 1L7
905-895-0554 / 888-854-0044
www.larkinplus.com

DATE	PROJECT
20190228	WILL

SCALE	DRAWING
GRAPHIC	CSP1

THE CORPORATION OF HALDIMAND COUNTY

By-law No. /19

Being a by-law to adopt Amendment Number HCOP-48 to the Haldimand County Official Plan by Shelagh Williams.

WHEREAS Haldimand County is empowered to enact this by-law, by virtue of the provisions of Sections 17 and 21 of the *Planning Act*, R.S.O. 1990, Chapter P.13, as amended;

AND WHEREAS this by-law conforms to the Haldimand County Official Plan;

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** Amendment No. HCOP-48 to the Haldimand County Official Plan for a property described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular; known municipally as 1801 River Road, Haldimand County, consisting of the map and explanatory text, as attached to form a part of this by-law, be hereby adopted.

2. **AND THAT** the effective date of this by-law shall be the date of final passing hereof.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____

MAYOR

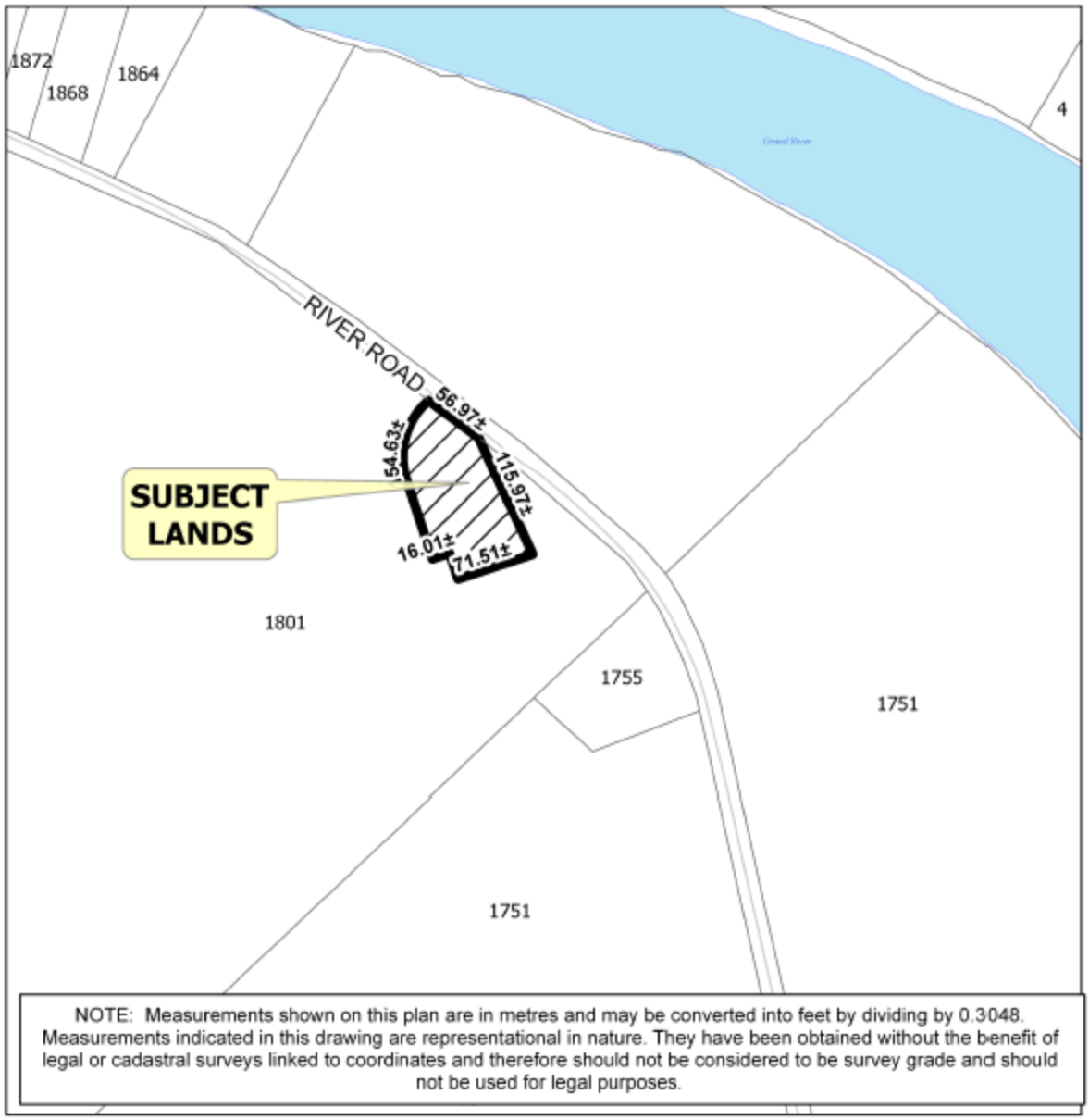
_____

CLERK

Amendment No. HCOP-48

To the Haldimand County Official Plan

0 1530 60 90 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considered to be survey grade and should not be used for legal purposes.

SCHEDULE 'A'

Ref: PLOP-HA-2019-037

AMENDMENT NO. HCOP-48
TO THE HALDIMAND COUNTY OFFICIAL PLAN

PART A: PREAMBLE TO THE AMENDMENT

1. Purpose of the Amendment:

The purpose of this Official Plan Amendment is to amend the designation of certain lands to include a site-specific 'Agriculture' designation to facilitate the establishment of a millwork business with management office. The Official Plan amendment would apply to the subject lands as illustrated on Schedule 'A'.

2. Location of the Lands Affected:

The subject lands are described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular, Haldimand County; known municipally as 1801 River Road, Haldimand County. The location of the subject lands is illustrated on the attached Schedule "A".

3. Basis of the Amendment:

The subject lands are designated 'Agriculture' within the Haldimand County Official Plan. Within the 'Agriculture' designation, the land base is to be protected and the use of the lands must be predominately agriculturally oriented, with permitted uses including all forms of farming, as well as land uses compatible with or related to agriculture. In terms of the proposed amendment there is no perceived negative impact on the prime agricultural area and the intent and purpose of the Provincial and local policies are maintained as the site does not represent a specialty crop area, there are no issues with the Minimum Distance Separation (MDS) formulae, and there are no alternative sites or sites with lower soil classes due to the general soil class in the County being between Class 1-3 soils. Further, due to the nature of the proposed use, and constraints (size and location) the subject lands represent an appropriate location for the proposed use. Furthermore, the subject proposal has been considered as an on-farm diversified use as defined in the Provincial Policy Statement. The lands subject to the amendment are identified in Schedule A of this amendment.

PART B: THE AMENDMENT:

The Haldimand County Official Plan is hereby amended as follows:

Map Amendment:

Schedule A.2 is hereby further amended by:

Identifying the lands shown as the subject lands on Schedule "A" of this amendment (attached to and forming part of this amendment) as being amended a site-specific 'Agricultural' designation (HCOP-48).

Text Amendment:

The following is added to Section 9.C (Site-Specific Policies) as HCOP-48:

The following policies shall apply only to those lands on Schedule “A.2” as having reference to this special provision:

a) Notwithstanding Section 3.A.5. of the Agriculture designation, a millwork and carpentry business employing no more than 6 staff, and associated management office shall also be permitted within the structures existing at the time this amendment was passed.

PART C: ADDITIONAL INFORMATION

Implementation:

This amendment will be implemented by Haldimand County by enacting an amendment to the Town of Haldimand Zoning By-law 1-H 86.

The subject lands will also be subject to site plan control, which will ensure that subsequent development on the parcel is subject to review by the County. Site plan control will provide the opportunity to review the location of road access, parking, massing of buildings, vegetative buffers, stormwater management/drainage and other identified measures. A site plan agreement may also be required to be registered on title as part of the site plan process.

Report Number:	PDD-22-2019
File Number:	PLOP-HA-2019-037
Name:	Steel City Millwork
Roll No.	2810-155-002-04070-0000

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend Zoning By-law 1 H-86, as amended, of the Town of Haldimand in the name of Steel City Millwork.

WHEREAS this by-law conforms to the Haldimand County Official Plan;

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** Schedule "A3" to Zoning By-law 1-H 86, as amended, is hereby amended by identifying as having reference to those lands described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular;, and being shown on Maps 'A' and 'B' attached hereto to form part of this By-law.

2. **THAT** Schedule "A3" to Zoning By-law 1-H 86 is hereby further amended by identifying the Subject Lands shown on Maps 'A' and 'B' attached hereto, as having reference to subsection 36.441.

3. **THAT** the following subsections shall be added to Section 36 (Special Provisions for Particular Parcels of Land) of the said By-law 1-H 86:

36.441

a) Section 28.1 (Permitted Uses) of the "Agricultural Zone (A)" shall also include:
    i. Carpentry and millwork business;
    ii. Office space accessory to an established carpentry and millwork business.

b) That notwithstanding the provisions of sections of the "Agricultural Zone (A)" of the Town of Haldimand Zoning By-law, 1-H 86 to the contrary, the following additional provisions shall apply:

    i. A workshop or storage building for a carpentry and millwork business shall be limited to a maximum area of 743 square metres;
    ii. A management office for a carpentry and millwork business shall be limited to a maximum of 232 square metres;
    iii. The number of employees shall not exceed six (6);
    iv. Open storage shall be prohibited in the required front yard.

4. **AND THAT** this by-law shall take effect and force on the day of passing.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

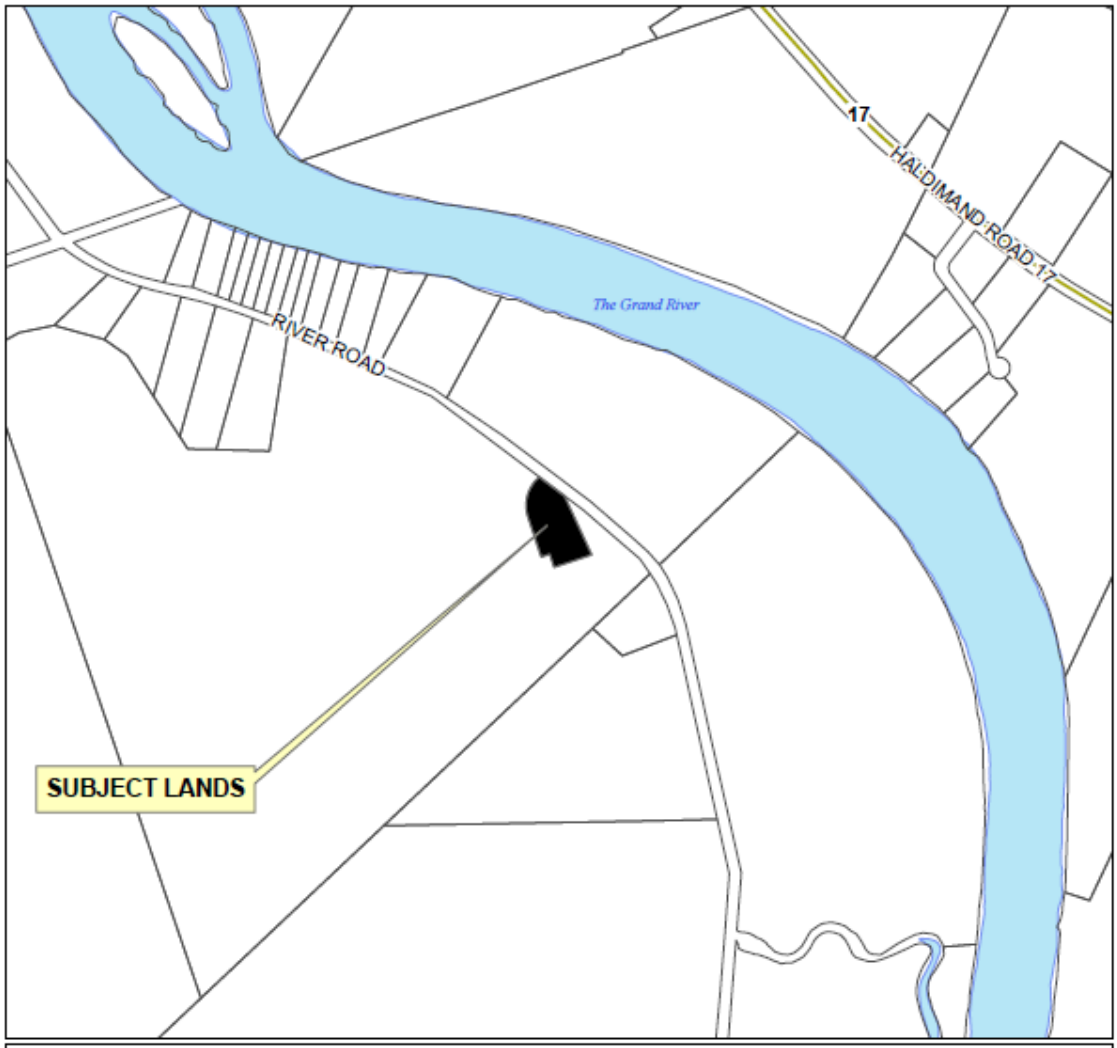
_____
CLERK

Schedule "A"

MAP A - Key Map

Haldimand County
Geographic Township of North Cayuga
Ward 2

0 125 250 375 500 Metres



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

_____ _____

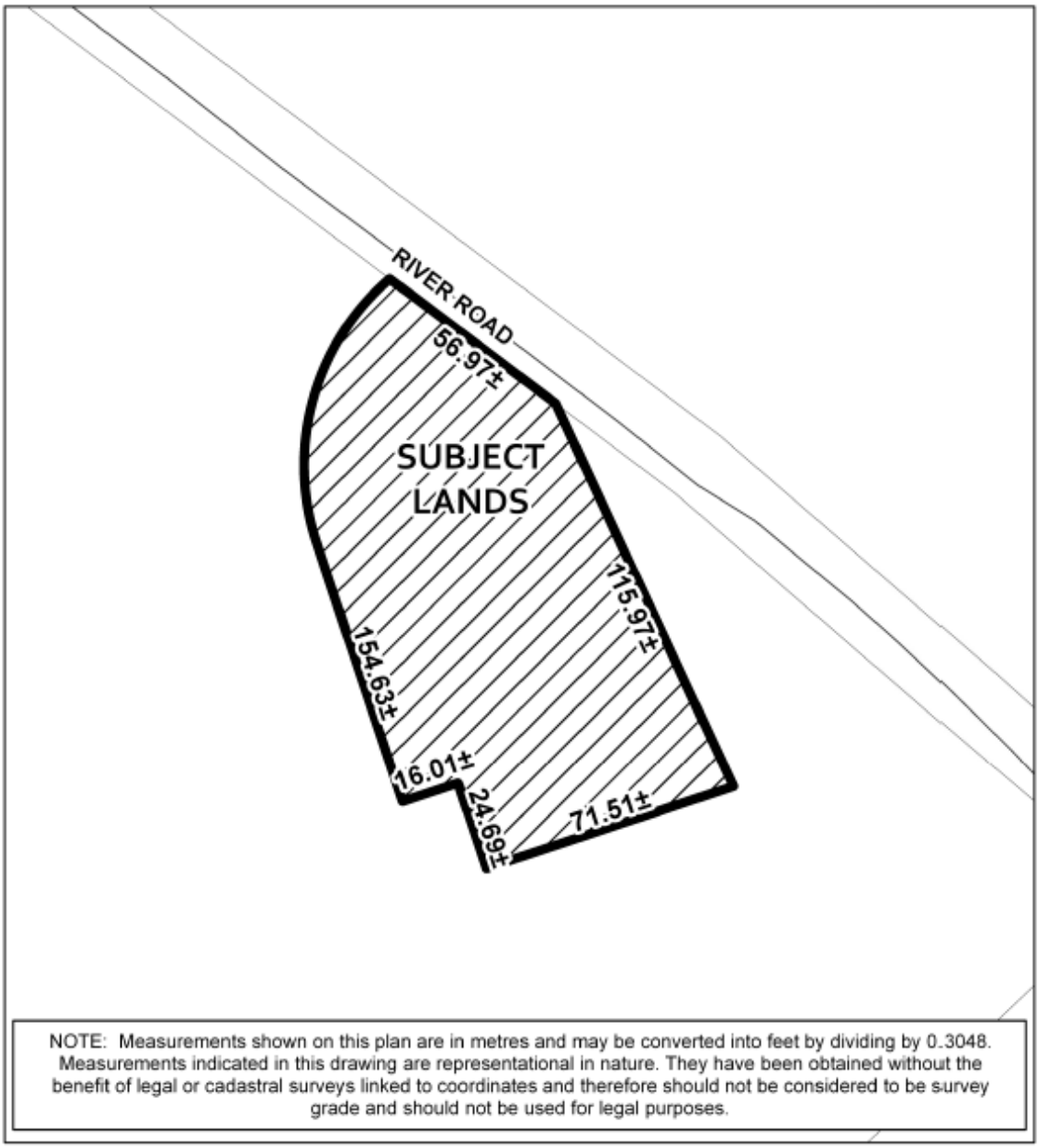
MAYOR CLERK

Ref: PLZ-HA-2019-038

MAP B - Detail Map

Haldimand County
Geographic Township of North Cayuga, Ward 2

SCALE: 1:1,500
0 10 20 30 40 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considered to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2018-038

PURPOSE AND EFFECT OF BY-LAW /19

This by-law affects lands located south of River Road in a predominantly agricultural area. The lands are described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular; known municipally as 1801 River Road, Haldimand County.

The purpose of this by-law is to permit a millwork and carpentry business and accessory office space on the subject lands through a site specific Zoning By-law Amendment to By-law 1-H 86.

In the Haldimand County Official Plan the subject lands are designated as 'Agriculture' which is also subject to a site specific amendment to support the proposed use.

The permitted uses in the 'A' zone are: farm, animal kennel, farm produce outlet, farm produce grading station, storage of school buses, seasonal storage of recreational vehicles and equipment as a secondary use to a permitted farm, commercial radio, television and telecommunication towers, but excluding any office or studio associated there with, structures accessory to a mine ventilation or emergency access shaft, one airstrip and one hangar, motor homes and bunk houses for seasonal workers provided they are located on the farm on which the seasonal workers are employed, one family dwelling house, farm stand, on-farm market, farm-related processing, and experiential activities.

In order to ensure appropriate on site development, this proposal will be subject to site plan control. Site plan control will address aspects of future development such as stormwater management, lot grading, location of entrance, grading to match shoulder, provision of the required number of parking spaces, and barrier-free access to building.

Report Number: PDD-22-2019
File Number: PLZ-HA-2019-038
Name: Steel City Millworks
Roll No. 2810-155-002-04070-0000

PDD-22-2019, Attachment 5

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend Zoning By-law 1 H-86, as amended, of the Town of Haldimand in the name of Shelagh Williams.

WHEREAS this by-law conforms to the Haldimand County Official Plan**;**

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** Schedule "A3" to Zoning By-law 1-H 86, as amended, is hereby amended by identifying as having reference to those lands described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular; and being shown on Maps 'A' and 'B' attached hereto to form part of this By-law, are hereby declared as a Site Plan Control Area and shall be subject to the provisions of Section 41 of the *Planning Act*, R.S.O. 1990, Chapter P.13, as amended.

2. **THAT** all development on said lands shall be subject to and in accordance with a development agreement, if required, pursuant to Section 41 of the *Planning Act*, R.S.O. 1990, Chapter P.13, as amended.

3. **THAT** the General Manager of Community and Development Services, or designate, is hereby delegated the power and authority of the Council of Haldimand County, as granted under Section 41 of the *Planning Act*, R.S.O. 1990, Chapter P.13, as amended.

4. **AND THAT** this by-law shall take effect and force on the day of passing.

READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

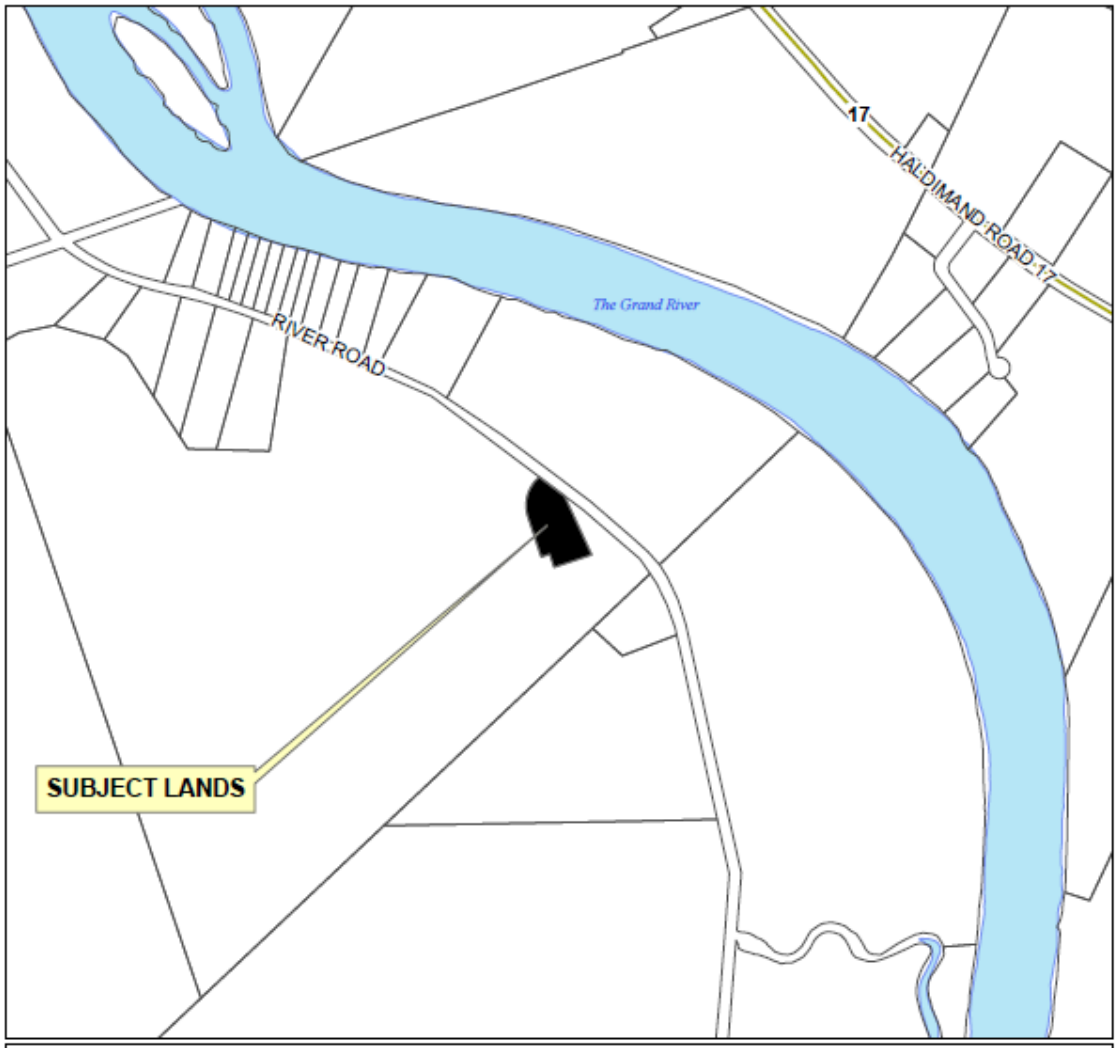
_____
CLERK

Schedule "A"

MAP A - Key Map

Haldimand County
Geographic Township of North Cayuga
Ward 2

0 125 250 375 500 Metres



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

_____ _____

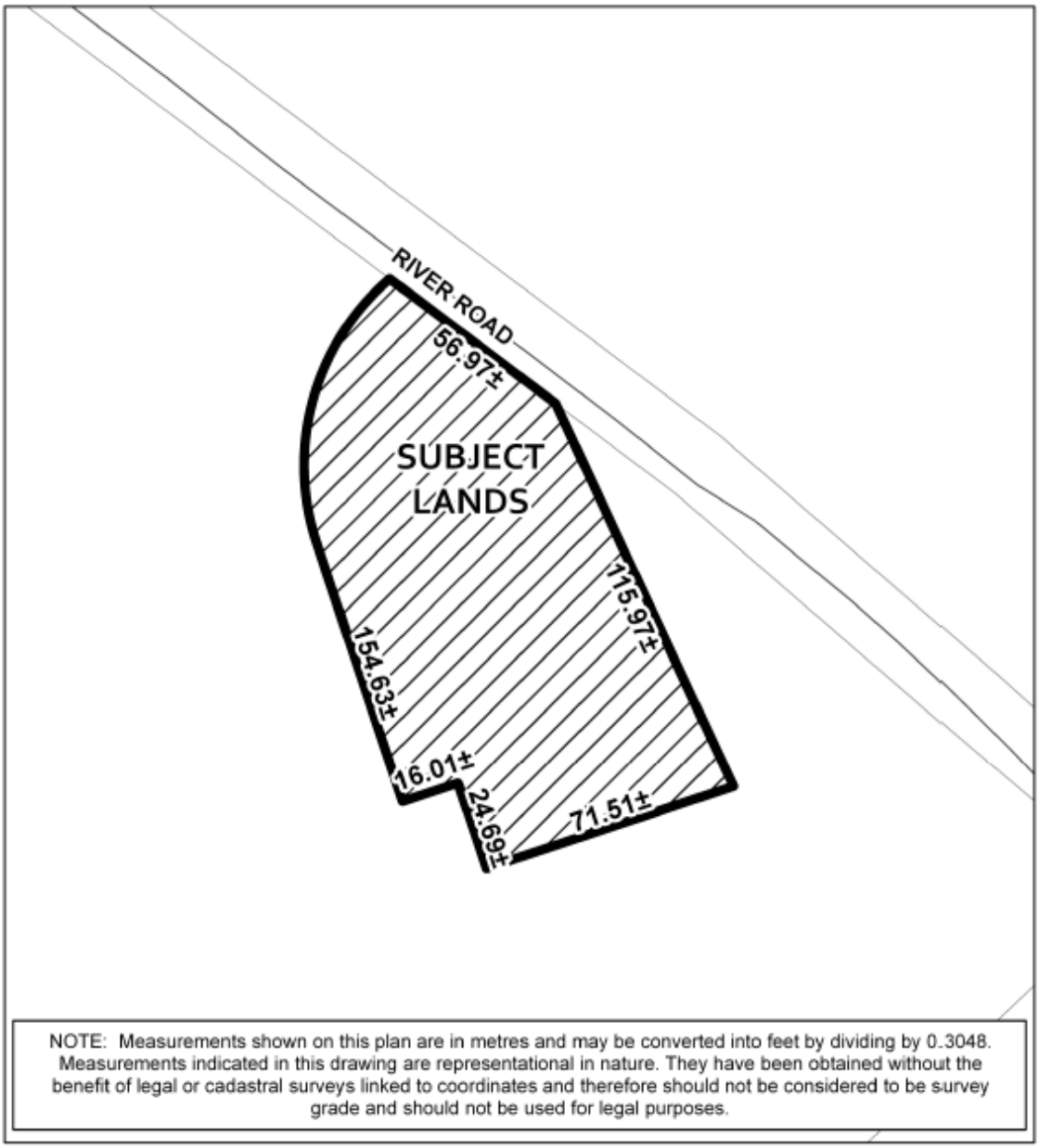
MAYOR CLERK

Ref: PLZ-HA-2019-038

MAP B - Detail Map

Haldimand County
Geographic Township of North Cayuga, Ward 2

SCALE: 1:1,500
0 10 20 30 40 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considered to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: PLZ-HA-2018-038

PURPOSE AND EFFECT OF BY-LAW /19

This by-law affects lands located south of River Road in a predominantly agricultural area. The lands are described as North Cayuga Concession 2 STR Part Lots 30-32 Irregular; known municipally as 1801 River Road, Haldimand County.

The purpose of this by-law is to designate the subject lands as a Site Plan Control area. Site Plan Control will ensure that any future development of a millwork and carpentry business on the subject parcel will be subject to a review by the County which will regulate many aspects of the development, including stormwater management, lot grading, location of entrance, parking area, grading to match shoulder, provision of the required number of parking spaces, septic tank, and barrier-free access to building.

Report Number:	PDD-22-2019
File Number:	PLOP-HA-2019-037 & PLZ-HA-2019-038
Name:	Steel City Millwork
Roll No.	2810-155-002-04070-0000

HALDIMAND COUNTY

Report PDD-18-2019 Jarvis Master Servicing Plan Update

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To inform Council of the conclusions and recommendations of the Jarvis Master Servicing Plan and to seek Council adoption of the study.

RECOMMENDATIONS:

1. THAT Report PDD-18-2019 Jarvis Master Servicing Plan Update be received;
2. AND THAT the Jarvis Master Servicing Plan - Final Report dated June 7, 2019, prepared by J.L. Richards and Associates Ltd. be adopted;
3. AND THAT staff be directed to include the recommended improvement works for new infrastructure identified within the Jarvis Master Servicing Plan - Final Report in the 2020 Ten Year Capital Budget and Forecasts;
4. AND THAT the Jarvis Master Servicing Plan be used to review development applications to identify improvements that are to be funded by developers;
5. AND THAT the recommendations of the Jarvis Master Servicing Plan - Final Report be included in future updates to the Development Charges By-law;
6. AND THAT the presentation by J.L. Richards and Associates Ltd. be received.

Prepared by: Peter Minkiewicz, MPL, Supervisor, Planning and Development

Reviewed by: Mike Evers, MCIP, RPP, BES, Director of Planning and Development

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The Jarvis Master Servicing Plan and Class Environmental Assessment were initiated in 2018 to, in part, address a preferred wastewater servicing option for the community of Jarvis, and to review the plan in total and conduct a comprehensive review of the servicing requirements within the community to meet expected growth. The plan will serve as the engineering and planning blueprint to inform development for the next 20 years.

BACKGROUND:

The community of Jarvis has been identified by Haldimand County as requiring a Master Servicing Plan (MSP) Update for storm drainage, wastewater conveyance, water distribution and transportation servicing, to meet the objectives of the County's Official Plan. The Plan is developed to be responsive

to population growth expectations, changing development densities and changes to transportation demands within the community. A Master Servicing Plan was developed in 2010 to address these issues. This report presents an update to those engineering considerations in light of current development conditions and demands upon the Town of Jarvis. The Master Servicing Plan Update Report documents the existing servicing conditions, identifies future servicing needs and recommends a servicing plan regarding the existing area designated for development. Of note, the plan lays out detailed needs and recommendations for those lands required for the 20 year growth forecasts of Jarvis, and which is generally focused on the northeast and southeast portions of the community. Lands that are outside of the 20 year requirement are not addressed in detail.

A separate Municipal Class Environmental Assessment was also conducted as part of the project to address the requirements for a wastewater servicing strategy for the Town of Jarvis, in which a number of options were reviewed to add new treatment capacity to be able to facilitate additional development. A preferred option was identified as a forcemain to convey wastewater to the existing Townsend Lagoons, as a longer term solution which would utilise existing surplus capacity and take advantage of built infrastructure.

The Master Servicing Plan Update was prepared by J.L. Richards and Associates Ltd. in accordance with the Master Servicing Approach of the Municipal Class Environmental Assessment (Class EA). The first two phases of the Municipal Class EA process, Problem Identification and Alternative Solutions have been followed. Stakeholder and agency consultation has been incorporated to address each study component within these two Class EA phases to produce comprehensive master plan in the form of a series of technical reports. The development of an updated Master Servicing Plan for Jarvis has the following benefits to the County:

- Establishes a long term servicing strategy that identifies key infrastructure improvements and responsibilities.
- Assists in a more appropriate assessment of Development Charges related to infrastructure upgrade requirements.
- Assists in the ability to process development applications as the overall servicing scheme is in place.
- Optimizes the process when done in concert with an Official Plan update. When development opportunities and population densities are established, servicing requirements are more readily determined.
- Enhances the ability to plan capital work and the financial plan associated with the capital program. MSP identifies infrastructure improvements and the key points where infrastructure improvements will be required to ensure key improvements are implemented as required.
- Fulfills Phases 1 and 2 of the Municipal Class EA process. Projects that are identified as Schedule A and Schedule B (below) could be advanced within the ten-year timeframe without additional study or process. After that timeframe, only an addendum to the original report would be required. Schedule C projects would still be subject to an individual EA regardless of the timeframe to advance the project. For further explanation, the below describes the differences between Schedules A, B and C:

  Schedule A projects are identified as being limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Class EA planning process. Schedule A projects generally include normal or emergency operational and maintenance activities.

  Schedule B projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process involving mandatory contact with directly affected public

and relevant review agencies, to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities.

Schedule C projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures as specified. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.

- This study forms the basis for the long-term (20 year) servicing plan for Jarvis and includes water, wastewater, stormwater and transportation. The purpose in taking this approach is to avoid short-term, reactive responses that are inefficient, more costly and not in keeping with an overall, sustainable strategy. By having a long-term strategy in place, decision-making can occur that is in keeping with that strategy and enables the incremental build-out of infrastructure that is part of an overall plan.

A Public information Centre was held on May 30, 2019 and was attended by 4 individuals. There were no project specific comments received from any of the attendees, nor were any comments received as part of the notification process. The summary project report produced by J.L. Richards & Associates Ltd. is included as Attachment 1 (part of the print and digital agendas). The appendices to that report, as well as the Jarvis EA for the wastewater solution, are included as Attachments 2 to 8 of the digital agenda (website) only due to the length and technical nature of those documents.

ANALYSIS:

The Jarvis Master Servicing Plan utilized two approaches to fulfill the requirements for completion of the Master Servicing Plan. The first was public consultation, which involved meeting with stakeholders and agencies, and one Public Information Centre to receive input and maximize public awareness about the process. Comments, suggestions and concerns received throughout the consultation process have been considered and/or addressed in the recommended plan.

The second approach was analysis and design of the required infrastructure to support the twenty-year timeframe for the study. This work involved a detailed study of the existing infrastructure within Jarvis combined with future projections for growth to determine the optimum timelines and requirements for improvement works.

In an effort to identify an immediate need for additional wastewater capacity within Jarvis, a Class Environmental Assessment process was concurrently undertaken to identify a preferred solution in which a separate Public Information Centre was also advertised and notification given to stakeholders including local developers and First Nations, and held to receive public input. Comments received through that process were generally supportive of the preferred option (forcemain to Townsend) and have been considered and/or addressed within the final recommendations and plans for the provision of additional wastewater capacity.

The following sections discuss each component analyzed as part of the overall Master Servicing Plan:

Water Distribution

The Jarvis water system consists of distribution pipes ranging from 100 mm to 400 mm in diameter. The Nanticoke Water Treatment Plant provides the potable water for Jarvis which is conveyed through a 750 mm transmission main to Townsend and a 500 mm transmission main to Jarvis and Hagersville.

An elevated storage tank is located north of Townsend and is responsible for providing storage for both Townsend and Jarvis. The distribution system operates as a single pressure zone with pressures maintained by water levels in the Townsend elevated storage tank.

Proposed upgrades to service the 20-year projected water demand volumes for the community of Jarvis, improve redundancy of supply and system looping include:

- Construction of approximately 1.8 KM of new distribution watermain to service development in the north east and south west quadrants of Jarvis. This will be funded by development (developers) as it proceeds; and
- Construction of a secondary supply line from the Nanticoke Water Treatment Plant (WTP) transmission main. Construction of this supply line will provide redundancy and additional capacity.

The total cost of the proposed distribution watermain upgrades is $2,439,000 with 100% of the cost being attributed to development as the distribution watermain is considered local service. Additionally, the cost of a new secondary supply line from the Nanticoke WTP transmission main is $2,197,000. Funding will be from DC's with a portion from the Water Reserve Fund, as there will be a benefit to existing users. Funding percentages cannot be determined until the timing of the project is confirmed.

Wastewater Servicing

The existing Jarvis wastewater system consists of one pumping station, the Jarvis Wastewater Lagoons and a collection system with sewers ranging in size from 150 mm to 375 mm.

Proposed upgrades to service the 20-year projected wastewater production volumes for the community of Jarvis include:

- Construction of a new Class 1 pumping station to service development in the south west quadrant of Jarvis. This will be a local service funded by development (developers);
- Construction of approximately 1 kilometre of new wastewater piping to service development in the north east quadrant of Jarvis. This will be a local service funded by development (developers);
- Construction of approximately 200 metres of new wastewater piping to service development in the south west quadrant of Jarvis. This will be a local service funded by development (developers);
- Replacement of existing pumps in the Jarvis Sanitary Pumping Station (SPS) to increase pumping capability. This is considered a system improvement and will be funded by DC's; and
- Construction of a forcemain from the Jarvis SPS to the Townsend lagoons. This is considered a system improvement and will be funded by DC's.

The total cost of new wastewater piping is $2,124,000 and the cost to construct the new forcemain and pump station upgrades is $5,400,000.

Stormwater Servicing

In general, the storm drainage system for Jarvis consists of a mixture of traditional rural servicing through roadside ditches and driveway culverts, urban curb and gutter with underground sewer infrastructure along Highways 3 and 6 in the central portion of town and newer development areas.

Jarvis Municipal Drains 1 and 2 were rehabilitated in 2010 and provide an outlet for much of the stormwater system.

Proposed stormwater infrastructure upgrades to meet 20-year projected stormwater needs include:

- Construction of approximately 500 m of new storm sewers to service development in the north east and south west quadrants of Jarvis. This will be a local service funded by development (developers);
- Construction of a new storm water management pond in the north east quadrant of Jarvis. This will be a local service funded by development (developers). The total cost of the proposed upgrades is $1,193,000.

Transportation

The majority of the existing roadways in Jarvis are designated as “Local” roads. Exceptions to this classification are Talbot Street (Highway 3) and Main Street (Highway 6), which are designated as “Connecting Links (Provincial Highway)”.

Proposed improvements to the transportation network system include:

- Construction of a new collector road extending south from Talbot Street East, across from Craddock Boulevard. Intersection improvements at Main Street/Talbot Street and Talbot Street/Craddock Boulevard (both locations are under MTO jurisdiction as connecting links).

Master Servicing Plan Next Steps:

Master Servicing Plans and updates conducted under the Municipal Class Environmental process must be formally filed as documents for a 30 day review period as part of Class EA Master Plan protocol to provide final public notice. Upon acceptance of the Plan by Council, this process will be initiated. If the process unfolds without a Part II Order (‘Bump up’ which would mean additional analysis required) the studies would be deemed complete.

FINANCIAL/LEGAL IMPLICATIONS:

The total cost of infrastructure upgrades to service potential new developments and upgrade existing systems is approximately $14 million, as shown below:

Service	Cost Estimate (2018 $)
Water Servicing	$4,600,000
Wastewater Servicing	$7,500,000
Stormwater Servicing	$1,500,000
Transportation Servicing	$400,000*
Total	**$14,000,000**

**Some cost to be attributed to MTO – amount to be determined.*

All projects associated with wastewater and stormwater servicing that have DC funding requirements, have been identified in the County’s DC by-law. For the projects that are planned to occur within the next ten years, these appear in the Council Approved 2019 Rated Supported Water and Wastewater Budget.

With the exception of the water supply main project and the intersection improvements that are under MTO jurisdiction, all projects associated with water servicing and transportation servicing that have DC funding requirements, have been identified in the County’s DC by-law. For the projects that are planned to occur within the next ten years, these appear in the Council Approved 2019 Rated Supported Water and Wastewater Budget.

It should be noted that upon future approval and implementation of the proposed capital works identified in the Master Servicing Plan, there would be reciprocal operating budget impacts for the ongoing operation and minor and major maintenance of the proposed new infrastructure.

STAKEHOLDER IMPACTS:

Through the implementation of the required works identified within the Jarvis Master Servicing Plan Public Works staff will need to conduct environmental assessments, conduct additional studies, prepare tenders and administer contracts to complete the work. Assistance by other Departments may be required through out the implementation of the plan.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: Yes

Policy: No

ATTACHMENTS:

1. Jarvis Master Servicing Plan Project File Report.
2. Existing Conditions (included with website agenda only).
3. Growth Forecast (included with website agenda only).
4. Implementation Plan (included with website agenda only).
5. Notice of Commencement (included with website agenda only).
6. Public Information Centre Materials (included with website agenda only).
7. Correspondence (included with website agenda only).
8. Jarvis Class Environmental Assessment (EA) Phase 2 Report (included with website agenda only).

June 7, 2019

Prepared for:

HALDIMAND COUNTY
Hagersville Satellite Office
1 Main Street South
Hagersville, ON N0A 1H0

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
107-450 Speedvale Ave West
Guelph, ON N1H 7Y6
Tel. 519-763-0713
Fax:519-763-9261

Master Plan – Project File Report

Jarvis Master Servicing Plan Update

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through service and commitment

Table of Contents

1.0 INTRODUCTION 1
1.1 Project Overview 1
1.2 Objectives of the Master Plan 1
1.3 Study Area Overview 1
1.4 Previous Studies 3
2.0 PUBLIC AND AGENCY CONSULTATION 4
2.1 Notice of Study Commencement 4
2.2 Public Information Centre 4
2.3 Public Stakeholder Comments 4
2.4 Developer Stakeholder Comments 5
2.5 Review Agency Consultation 5
3.0 WORK PACKAGE OVERVIEW 6
3.1 Work Package 1 – Existing Conditions 6
3.2 Work Package 2 – Growth Forecast and Assessment of Future Needs 6
3.3 Work Package 3 & 4 – Preferred Strategies and Implementation Plan 7
4.0 NEXT STEPS 8
5.0 LIMITATIONS 8
6.0 REFERENCES 9

List of Figures

Figure 1 - Jarvis MSP Study Area Boundary 2

List of Tables

Table 1 - Summary of Public Stakeholder Comments 4
Table 2 - Summary of Developer Stakeholder Comments 5
Table 3 - Summary of Agency Comments 5
Table 4 - Cost Estimate of Preferred Servicing Alternatives 7

List of Appendices

Appendix A – Work Package 1 – Existing Conditions
Appendix B – Work Package 2 – Growth Forecast and Future Needs
Appendix C – Work Package 3&4–Preferred Servicing Strategies and Implementation
Appendix D – Notice of Study Commencement and Distribution List
Appendix E – Public Information Centre Materials
Appendix F – Correspondence

1.0 INTRODUCTION

1.1 Project Overview

The community of Jarvis is located approximately 15 kilometres north of Lake Erie in the western part of Haldimand County (the County) at the cross roads of Highway 6 and Highway 3. The community has a population of approximately 2,000 residents (Watson, 2018), and development is predominantly residential. Industrial, commercial, and institutional (ICI) development is concentrated in the north side of the community along Highway 6.

In 2010 the Jarvis Master Servicing Plan (MSP) for Water, Wastewater, Stormwater, and Transportation (Stantec, 2010) was completed. To support planned growth and intensification identified in the County's Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP). The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area, and identify updates to existing conditions and related assumptions based on growth that has since occurred.

1.2 Objectives of the Master Plan

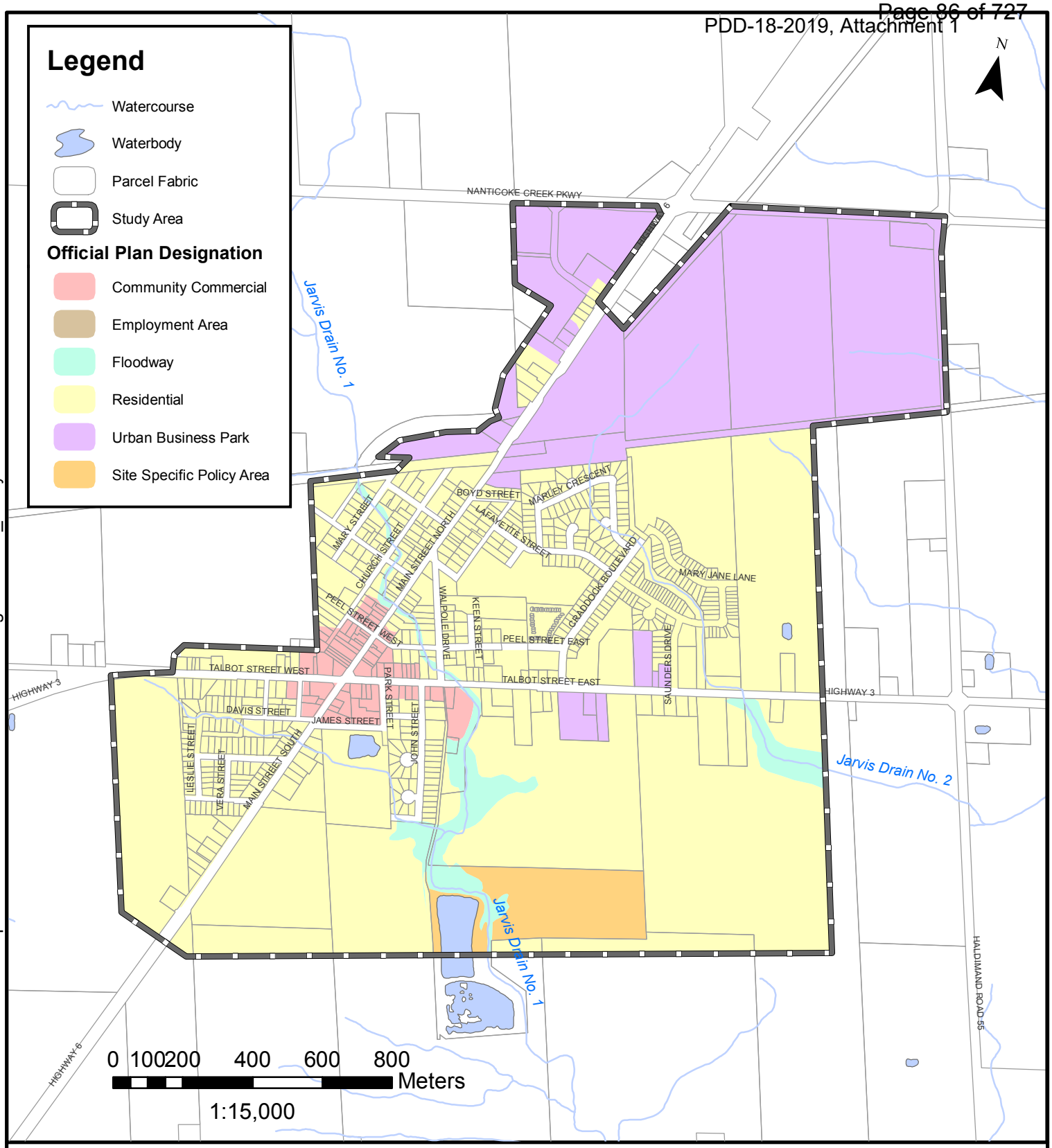
The Master Plan update considers the findings from the 2010 MSP, as well as changes to the environment (as defined in the EA Act) and infrastructure since it was completed. Each component of the MSP update will be provided in the framework provided below:

- Work Package 1 – Existing Conditions (Appendix A)
- Work Package 2 – Growth Forecast and Future Needs (Appendix B)
- Work Package 3&4–Preferred Servicing Strategies and Implementation Plan (Appendix C)

As well as updating the MSP, the County is concurrently conducting a review of fire flow requirements in the County (Work Package 5) and a Class EA to determine the preferred alternative to increase wastewater treatment capacity for Jarvis (Project File Report to be issued June 2019). The fire flow review and Class EA are documented in separate reports.

1.3 Study Area Overview

The study area for the MSP update encompasses the urban boundary of Jarvis, and is consistent with the 2010 Jarvis MSP study area. Figure 1 illustrates the study area boundary. Municipal infrastructure in Jarvis includes a communal water and wastewater system, stormwater infrastructure and a transportation network.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

STUDY AREA BOUNDARY AND DESIGNATED LAND USES

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

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DESIGN:	JW
DRAWN:	KTK
CHECKED:	JW
JLR #:	28176

DRAWING #:

FIGURE 1

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 1\28176_StudyArea.mxd

Plot Date: March 21, 2019 10:44:24 AM

Community water is supplied via a transmission main from the Nanticoke Water Treatment Plant (WTP) and is stored in a shared elevated tank north of Townsend. Wastewater in Jarvis is conveyed to the Jarvis wastewater treatment lagoons which are owned and operated by the County. The storm system in Jarvis generally consists of traditional stormwater management infrastructure (e.g. ditches, urban curb and gutter networks) and two (2) stormwater management (SWM) facilities. The community of Jarvis is built adjacent to Highway 6 (Main Street) and Highway 3 (Talbot Street). Both those highways are “connecting links” in the Provincial highway network.

1.4 Previous Studies

In 2010, a Master Servicing Plan report was prepared (Stantec, 2010) to help guide the development of water, wastewater, storm and transportation services with respect to the County’s Official Plan to accommodate future development. Further details of the report findings are discussed in Work Package 1 (Appendix A).

In addition to the 2010 MSP referenced throughout this report, the following studies related to water, wastewater, stormwater and transportation infrastructure in Jarvis are referenced in the preparation of this Master Servicing Plan Update.

2010 MSP – present

Haldimand County Services and Planning Division. *Design Criteria*, Version 4.0, April 2015.

Ministry of Municipal Affairs and Housing. Ontario Government, *Provincial Policy Statement, 2014*, Section 3 Planning Act, 30 April 2014.

Haldimand County Planning & Economic Development Department. *The Haldimand County Official Plan*, Council adopted 26 June 2006, Ministry approved 8 June 2009.

Lake Erie Region Source Protection Committee. Long Point Region Source Protection Area Approved Source Protection Plan, Under Clean Water Act 2006, 4 November 2015.

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update*, 2016-2046 - Preliminary Draft Findings. October 2018.

Upper Canada Consultants. *Topographic Volumetric Survey of Jarvis Sewage Lagoons*, 17 July 2018.

Dave Chapman (CPO Inc.). *Jarvis lagoons: Capacity Assessment & Contingency and Abatement Plan Technical Memo,* 6 June 2011.

CPO Inc. and Haldimand County. *Jarvis lagoon Effluent Phosphorous Offsetting,* 20 July 2016.

Stantec Consulting Ltd. *Jarvis Master Servicing Plan Water, Wastewater, Stormwater, and Transportation*, September 2010.

Prior to 2010 MSP

Stantec Consulting Ltd. *Jarvis Inflow and Infiltration Study*, March 2010.

2.0 PUBLIC AND AGENCY CONSULTATION

2.1 Notice of Study Commencement

A Notice of Study Commencement (provided in Appendix D) was prepared by the consulting team. The Notice included a comment form for stakeholders to return by mail or email. A project mailing list was developed identifying developer and review agency stakeholders. A copy of the mailing list is also provided in Appendix D. The Notice was issued via the following means:

- Placed on the County's website starting March 29, 2019.
- Placed in two (2) issues of the local newspaper between March 28, 2019 and May 30, 2019.
- Mailed to developers and review agencies on March 29, 2019.
- Emailed to Aboriginal Communities on April 5, 2019.

Responses received to the Notice of Commencement are included in Section 2.3 to 2.5.

2.2 Public Information Centre

The Public Information Centre (PIC) for the Master Servicing Plan took place on May 30, 2019 at the Jarvis Library from 4:00 to 6:00 pm. A Notice of PIC (provided in Appendix E) was prepared by the consulting team. The Notice was issued via the following means:

- Placed on the County's website starting May 22, 2019.
- Placed in two (2) issues of the local newspaper between May 22, 2019 and May 30, 2019.
- Mailed to developers and review agencies on May 21, 2019.

Boards presenting the project information were on display (provided in Appendix E) and representatives from the project team and staff from the County were available to answer questions during the PIC. The PIC was attended by four (4) members of the public. Comment forms were provided; however, no completed forms were received. Refer to Appendix E for a copy of the comment form.

2.3 Public Stakeholder Comments

Table 1 below provides a summary of public comments received to date regarding this Master Plan. Comments regarding the Jarvis Additional Wastewater Treatment Capacity Class EA are documented in the Class EA Phase 2 Report (Work Package 6).

Table 1 - Summary of Public Stakeholder Comments

Stakeholder	Comment	Action
Public Commenter 1	May 27, 2019 – Questioned if property is located in the study area.	Confirmed that property is located outside of study area. No further action required.

2.4 Developer Stakeholder Comments

Table 2 provides a summary of developer comments received to date regarding this Master Plan. Refer to Appendix F for a copy of the Developer written correspondence received.

Table 2 - Summary of Developer Stakeholder Comments

Stakeholder	Comment	Action
Developer 1	April 3, 2019 – Noted that the Notice of Commencement did not include information regarding the PIC. Asked that this information be provided.	Included on distribution list for the PIC.
Developer 2	April 30, 2019 - Asked if any works are proposed for Hagersville.	Provided the developer with Peter Minkiewicz's contact information. No further action required.

2.5 Review Agency Consultation

Table 3 provides a summary of agency comments received to date regarding this Master Plan. Refer to Appendix F for a copy of the Agency written correspondence received.

Table 3 - Summary of Agency Comments

Stakeholder	Comment	Action
Ministry of Tourism, Culture, and Sport (MTCS)	April 3, 2019 – The MTCS indicated that a Heritage Impact Assessment (HIA) should be undertaken by licensed consultants, submitted to MTCS for review, and incorporated into the Master Plan. MTCS also recommends determining if an archaeological assessment will be required using MTCS *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential*.	The proposed projects will be screened using the MTCS Criteria for Evaluating Archaeological Potential and the MTCS Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes prior to implementation
Ministry of the Environment, Conservation and Parks	April 5, 2019 – The MECP provided a list of Aboriginal communities that require consultation as part of the duty to consult and outlined steps that must be followed in relation to Aboriginal consultation. The MECP requested that all Notices and the completed project information form is sent to the West Central Region.	Aboriginal communities were contacted on April 5, 2019

3.0 WORK PACKAGE OVERVIEW

Four (4) work packages have been prepared by the project team in support of this Master Plan. This section summarizes the main findings of each package. These findings were used to evaluate and select future water, wastewater, stormwater, and transportation servicing alternatives in Jarvis. The findings from each package are summarized in the following sections.

3.1 Work Package 1 – Existing Conditions

J.L. Richards & Associates Limited (JLR) completed a background review of the existing servicing conditions in Jarvis. This included a review of the findings from the 2010 MSP, as well as an analysis of the existing servicing conditions and constraints present in Jarvis. The following major constraints were identified:

- Water Servicing: Under existing conditions, approximately 40% of junctions are capable of meeting the proposed fire flow requirement of 80 L/s. It was also identified that the County may wish to consider an additional connection from the Nanticoke WTP to increase water supply redundancy and improve system looping.
- Wastewater Servicing: A bottleneck exists in the system at the intersection of Talbot Street and Walpole Drive.
- Stormwater Servicing: During the 5-year event, there are two (2) locations where water surcharges to the surface, both of which are in the Marley/Cradoock sewershed. As well, two (2) independent inlets and sewers on Cabot Court and Craddock Boulevard accept more inflow than the sewer capacity can handle, causing surcharge to the surface.
- Transportation Servicing: No critical movements were identified at any of the study intersections.

Please refer to Appendix A for the full work package.

3.2 Work Package 2 – Growth Forecast and Assessment of Future Needs

JLR completed an analysis of the future servicing needs required by Jarvis based on the projected residential and Industrial, Commercial, and Institutional (ICI) growth projections. Based on a study by Watson & Associates Economists Limited (Watson, 2018), the anticipated population growth for the 20-year horizon from 2018 to 2038 is an increase of 340 persons and 178 units respectively.

Based on the population and development growth in Jarvis, the following future conditions and constraints were identified:

- Water Servicing: Under future conditions, due to improved looping, approximately 80% of junctions are capable of meeting the proposed fire flow requirement of 80 L/s. Consideration should be given to an additional connection from the Nanticoke WTP to increase water supply redundancy and improve system looping.

- Wastewater Servicing: Under future conditions, there is potential flood risk at Walpole Drive and Talbot Street East intersection (existing constraint) as well as at the intersection of Cradock Boulevard and Peel Street East. There will be capacity constraints at Main Street North, just south of Lydia Street.
- Stormwater Servicing: During the 5-year event, there are two (2) locations where water surcharges to the surface, both of which are in the Marley/Cradoock sewershed. As well, two (2) independent inlets and sewers on Cabot Court and Craddock Boulevard accept more inflow than the sewer capacity can handle, causing surcharge to the surface.
- Transportation Servicing: Under future conditions, there is a decrease in Level of Service (LOS) at the intersection of Talbot Street and Main Street, and the eastbound approach movement of Nanticoke Creek Parkway. There is potential for remedial measures at these intersections.

Please refer to Appendix B for the full work package.

3.3 Work Package 3 & 4 – Preferred Strategies and Implementation Plan

Work Package 3 – Preferred Servicing Strategies and Work Package 4 – Implementation Plan were combined into one (1) document. JLR developed a number of servicing strategies based on the 2010 MSP as well as the identified existing and future servicing constraints. Required projects and cost estimates were updated for the various servicing projects proposed in the 2010 MSP. A summary of the total cost of the proposed upgrades to meet 20-year projected demands is provided in Table 4.

Table 4 - Cost Estimate of Preferred Servicing Alternatives

Service	Cost Estimate 2018-2038 (2018$)	Cost Estimate >2038 (2018$)
Water Servicing	$4,636,000	$1,059,000
Wastewater Servicing	$7,524,000*	$1,810,000
Stormwater Servicing	$1,516,000	$3,914,000
Transportation Servicing	$1,060,000	$2,230,000
Total	**$14,736,000**	**$9,013,000**

* Includes $5.4M for upgrades to the main SPS and a new forcemain to Townsend

Please refer to Appendix C for the full work package.

4.0 NEXT STEPS

Following the receipt of comments from affected parties and review agencies, and confirmation of the preferred alternative, the Town will be in a position to post the Class EA Project File that documents the Class EA process. After the 30-day period for comment closes, and if there is no request for a “Part II Order” from the MECP, the Phase 1 and 2 of the Class EA will be complete. The County will then be in position to consider Project Implementation of Schedule B projects and proceed directly into preliminary design.

5.0 LIMITATIONS

This report has been prepared for the exclusive use of Haldimand County, for the stated purpose. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Haldimand County and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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6.0 REFERENCES

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update, 2016-2046 - Preliminary Draft Findings*. October 2018.

Appendix A

Work Package 1 – Existing Conditions

Issued: November 16, 2018
Revised: June 7, 2019

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Work Package 1 – Existing Conditions

Jarvis Master Servicing Plan Update

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Table of Contents

1.0 INTRODUCTION 1
1.1 Project Overview 1
1.2 Objectives Of The Master Plan 1
1.3 Study Area Overview 1
1.4 Previous Studies 3
2.0 CLASS ENVIRONMENTAL ASSESSMENT 4
2.1 Class Environmental Assessment and Master Planning Process 4
2.2 Problem Statement 4
2.3 Public Consultation Plan 5
3.0 EXISTING CONDITIONS 5
3.1 Planning Policy Context 5
3.2 Population and Household Forecast 6
3.3 Environmental Features 9
4.0 WATER SERVICING 11
4.1 Summary of Findings from the 2010 MSP 11
4.2 Water Demand Update 11
4.3 Updated System Information and Modelling 12
4.4 Existing Water Servicing Conditions and Constraints 16
5.0 WASTEWATER SERVICING 20
5.1 Summary of Findings from 2010 Master Servicing Plan 20
5.2 Wastewater Flow Update 20
5.3 Updated System Information and Modelling 22
5.4 Existing Wastewater Servicing Conditions and Constraints 24
6.0 STORMWATER 26
6.1 Summary of Findings from 2010 Master Servicing Plan 26
6.2 Updated System Information and Modelling 26
6.3 Existing Stormwater Servicing Conditions and Constraints 28
7.0 TRANSPORTATION SERVICING 32
8.0 CONCLUSION 32
9.0 REFERENCES 33

List of Figures

Figure 1 Study Area Boundary and Designated Land Uses 2
Figure 2 Development from 2010 to 2018 8
Figure 3 Updates to Existing Water System 13
Figure 4 System Pressures under Peak Hour Demand 17
Figure 5 Available Fire Flow under Maximum Day Demand 19
Figure 6 Updates to Existing Wastewater Collection System 23
Figure 7 Flow to Pipe Capacity Ratio 25
Figure 8 Updates to Existing Stormwater Drainage System 27
Figure 9 Surcharge to Surface Map under 5-Year 30
Figure 10 Flow to Pipe Capacity Ratio 31

List of Tables

Table 1 Summary of Equivalent Population for Jarvis 6
Table 2 Historical Average Water Demand (2013-2017) 12
Table 3 Summary of Modelled Water Demands (Existing) 14
Table 4 Existing Treated Water Storage Requirements 15
Table 5 Percentage of Junctions Capable of Meeting Fire Flow (2018) 18
Table 6 Historical Average Raw Sewage Flows (2013 – 2017) 21
Table 7 Historical Maximum Day Raw Sewage Flows (2013 – 2017) 21
Table 8 Summary of Modelled Wastewater Flow (Existing) 24

List of Appendices

Appendix A – Water Model Parameters

Appendix B – Wastewater Model Parameters

Appendix C – Stormwater Model Parameters

Appendix D – Transportation Report

1.0 INTRODUCTION

1.1 Project Overview

The community of Jarvis is located approximately 15 kilometres north of Lake Erie in the western part of Haldimand County (the County) at the cross roads of Highway 6 and Highway 3. The community has a population of approximately 2,000 residents (Watson, 2018) and development there is predominantly residential. Industrial, commercial, and institutional (ICI) development is concentrated in the north side of the community along Highway 6.

In 2010, the Jarvis Master Servicing Plan (MSP) for Water, Wastewater, Stormwater, and Transportation (Stantec, 2010) was completed. To support planned growth and intensification identified in the County's Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP). The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area, and identify updates to existing conditions and related assumptions based on growth that has since occurred.

1.2 Objectives of the Master Plan

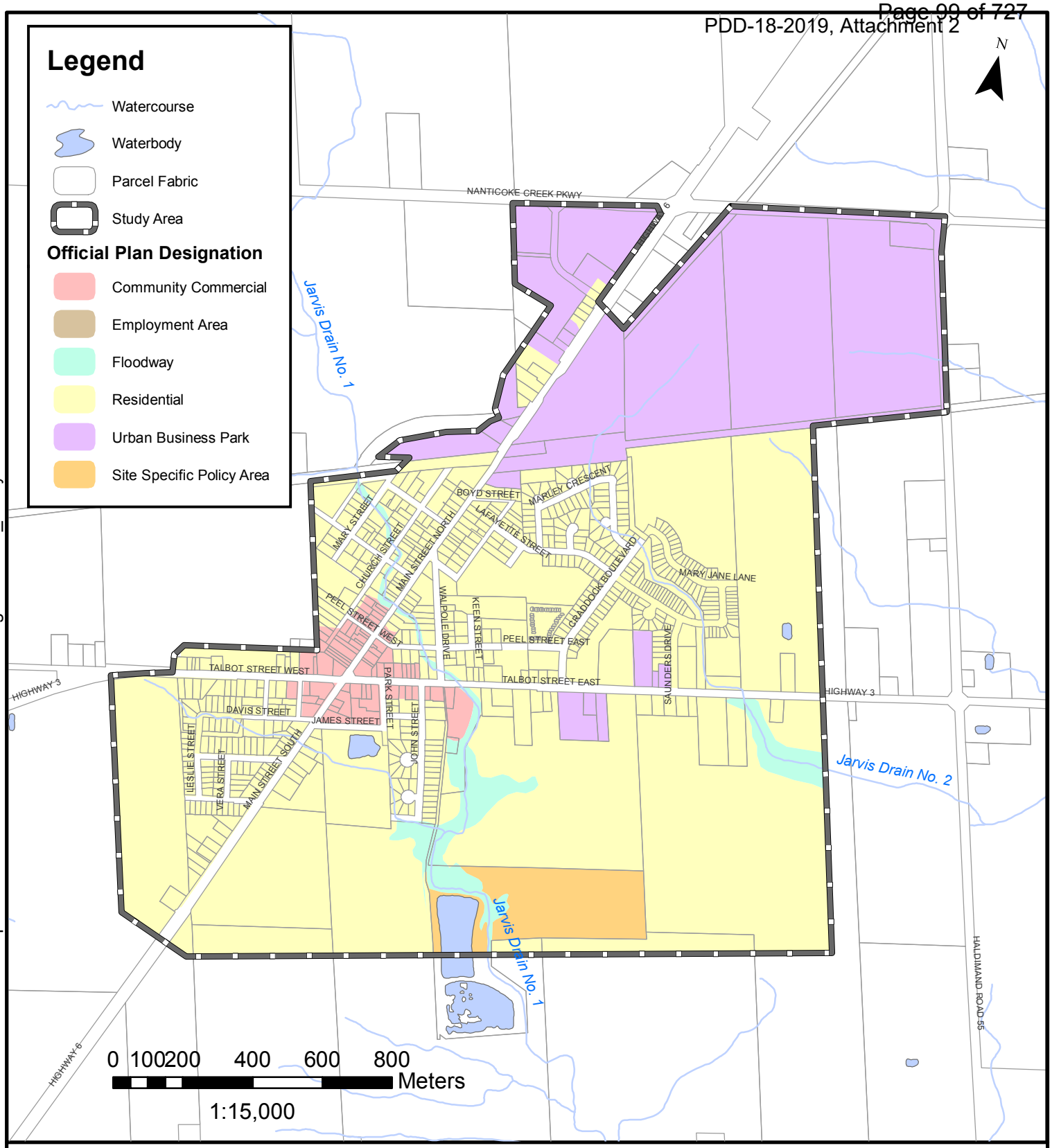
The Master Plan update will consider the findings from the 2010 MSP, as well as changes to the environment (as defined in the EA Act) and infrastructure since it was completed. Each component of the MSP update will be provided in the framework provided below:

- Work Package 1 – Background Review and Updates to Existing Conditions
- Work Package 2 – Growth Forecast and Assessment of Future Needs
- Work Package 3 – Development of Preferred Servicing Strategies
- Work Package 4 – Implementation Plan, Final Report and Presentation.

As well as updating the MSP, the County is concurrently conducting a Class EA to determine the preferred alternative to increase wastewater treatment capacity for Jarvis. The Class EA will be documented in a separate report.

1.3 Study Area Overview

The study area for the MSP update encompasses the urban boundary of Jarvis, consistent with the 2010 Jarvis MSP study area. Figure 1 illustrates the study area boundary. Municipal infrastructure in Jarvis includes a municipal water and wastewater system, stormwater infrastructure, and a transportation network.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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STUDY AREA BOUNDARY AND DESIGNATED LAND USES

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FIGURE 1

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Community water is supplied via a transmission main from the Nanticoke Water Treatment Plant (WTP) and stored in a shared elevated tank north of Townsend. Wastewater in Jarvis is conveyed to the Jarvis wastewater treatment lagoons which are owned and operated by the County. The storm system in Jarvis generally consists of traditional stormwater management infrastructure (e.g. ditches, urban curb and gutter networks) and two (2) stormwater management (SWM) facilities. The community of Jarvis is built adjacent to Highway 6 (Main Street) and Highway 3 (Talbot Street). Both those highways are “connecting links” in the Provincial highway network.

1.4 Previous Studies

In 2010, a Master Servicing Plan (MSP) was prepared (Stantec, 2010) to help guide the development of water, wastewater, storm and transportation services with respect to the County’s Official Plan to accommodate future development. Further details of the report findings are discussed in each of the respective servicing subsections.

In addition to the 2010 MSP referenced throughout this report, the following studies related to water, wastewater, stormwater, and transportation infrastructure in Jarvis are referenced in the preparation of this Master Servicing Plan Update.

2010 MSP – present

Haldimand County Services and Planning Division. *Design Criteria*, Version 4.0, April 2015.

Ministry of Municipal Affairs and Housing. Ontario Government, *Provincial Policy Statement, 2014*, Section 3 Planning Act, 30 April 2014.

Haldimand County Planning & Economic Development Department. *The Haldimand County Official Plan*, Council adopted 26 June 2006, Ministry approved 8 June 2009.

Lake Erie Region Source Protection Committee. Long Point Region Source Protection Area Approved Source Protection Plan, Under Clean Water Act 2006, 4 November 2015.

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update*, 2016-2046 - Preliminary Draft Findings. October 2018.

Upper Canada Consultants. *Topographic Volumetric Survey of Jarvis Sewage Lagoons*, 17 July 2018.

Dave Chapman (CPO Inc.). *Jarvis lagoons: Capacity Assessment & Contingency and Abatement Plan Technical Memo,* 6 June 2011.

CPO Inc. and Haldimand County. *Jarvis lagoon Effluent Phosphorous Offsetting,* 20 July 2016.

Stantec Consulting Ltd. *Jarvis Master Servicing Plan Water, Wastewater, Stormwater, and Transportation*, September 2010.

Prior to 2010 MSP

Stantec Consulting Ltd. *Jarvis Inflow and Infiltration Study*, March 2010.

2.0 CLASS ENVIRONMENTAL ASSESSMENT

2.1 Class Environmental Assessment and Master Planning Process

The Ontario Environmental Assessment Act (Act) sets out a planning and decision-making process to consider potential environmental effects before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. In 1987, the first Class EA document prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011 and 2015.

This Master Servicing Plan Update is being completed with sufficient detail to fulfil the requirements for Schedule B projects (Approach #2), concurrently with a Class Environmental Assessment, for additional wastewater treatment capacity at the Jarvis Wastewater Treatment Lagoons.

Projects categorized as Schedule B or Schedule C undertakings have the potential for significant environmental impacts and are required to follow specific phases under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project and the preparation of a Class EA Project File or Environmental Study Report that documents the Class EA process.

For the Master Servicing Plan Update, a Project File or Environmental Study Report will be made available for public and agency review at the completion of the Class EA process for a mandatory 30-day period. If there are no requests to the Minister of the Environment, Conservation and Parks (MECP) for a ‘Part II Order’ within the review period, then the project can proceed to implementation (Phase 5).

2.2 Problem Statement

To support planned growth and intensification identified in the County’s Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP) The purpose of the Master Servicing Plan Update is to evaluate the community’s long-term infrastructure needs and identify a preferred solution to be implemented to match growth in Jarvis over the next 20 years.

The Class EA framework will enable consideration of options and identify a preferred solution that is environmentally, socially, and financially responsible and sustainable.

The study will consider the needs and viewpoints of all participating stakeholders including, but not limited to, residents, government agencies, the general population, and Indigenous communities.

2.3 Public Consultation Plan

Public and agency consultation for this assignment is anticipated to consist of:

- Notice of Commencement
- Meetings with Review Agencies (as required)
- Project Committee Meetings
- Public Information Centre(s)
- Filing of the Project File/ESR and Notice of Completion

Consultation activities undertaken as part of the MSP Update will be documented in subsequent Work Packages.

3.0 EXISTING CONDITIONS

3.1 Planning Policy Context

3.1.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) enacted in 2005 was in place at the time of the 2010 MSP. Its purpose was to establish the planning framework for all future development within the province.

The 2005 PPS was replaced on April 30, 2014 by the 2014 Provincial Policy Statement (PPS). Like the earlier version, the updated Statement provides general policy guidance on matters of provincial interest related to land use planning and development. The 2014 PPS also provides policy direction for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural environment.

All local planning matters must be consistent with the 2014 PPS, which is issued under Section 3 of the Planning Act.

As part of the update, changes were made to policies related to infrastructure, servicing (sewer and water), climate change, natural heritage wetlands and water, and aboriginal interests that may have implications at the Master Plan level. In subsequent phases of this Master Plan and Class EA, alternatives will be assessed on the basis of conformance with the 2014 PPS.

3.1.2 Places to Grow

The Growth Plan for the Greater Golden Horseshoe, 2017 was released on May 18, 2017 and came into effect on July 1, replacing the Growth Plan for the Greater Golden Horseshoe, 2006. The present study area is in the Greater Golden Horseshoe Growth Plan Area.

3.1.3 Haldimand County Official Plan

The Haldimand County Official plan was adopted by Council in 2006 and approved by the Ontario Ministry of Municipal Affairs & Housing in 2009. The Official Plan has not been updated since the completion of the 2010 MSP and an update is underway to incorporate changes from the Growth Plan for the Greater Golden Horseshoe.

3.2 Population and Household Forecast

3.2.1 Population

Estimates of population and household growth for Jarvis are currently being prepared in the Population, Housing, and Employment Projections Study Update, 2016-2046 (Watson, 2018). A preliminary version of the study indicates that that the population of Jarvis was 2,000 in 2016, down from the 2011 population of 2,500 persons.

3.2.2 Equivalent Population

The following assumptions updated from 2010 MSP based on Haldimand County Design Criteria Version 4.0, April 2015 and input from County staff were used to calculate equivalent population.

- Low/medium density housing equivalent population of 55 persons/ha.
- High density housing equivalent population of 135 persons/ha.
- Commercial equivalent population of 90 persons/ha.
- Actual development coverage to be 75% of vacant land for industrial, commercial and institutional land uses.

Since the completion of the 2010 MSP, approximately 5.9 ha (99 units) of low density residential land, 0.65 ha (24 units) of high density residential land, and 0.51 ha of commercial land has been developed.

A summary of existing equivalent population is provided in Table 1

Table 1 Summary of Equivalent Population for Jarvis

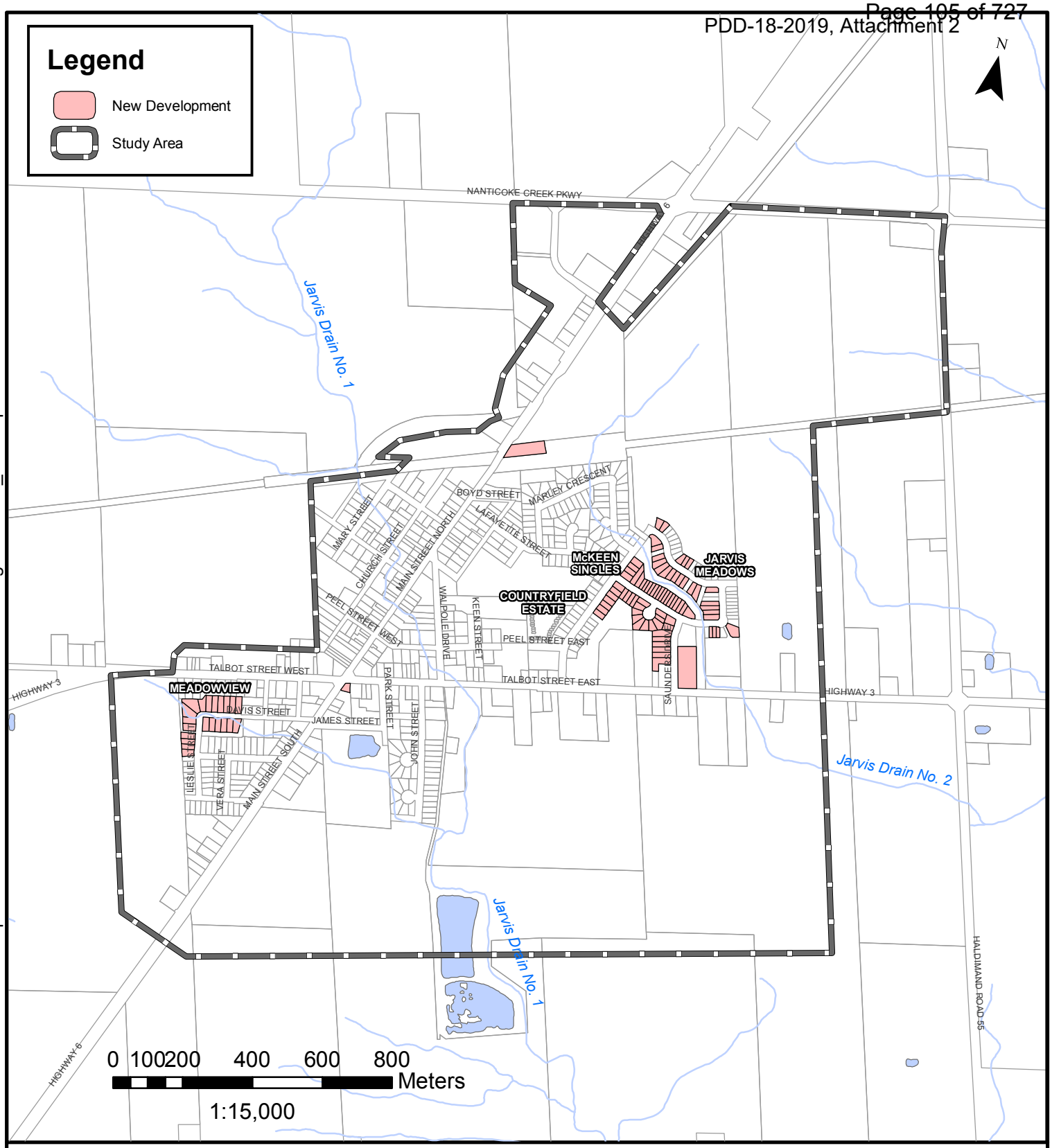
Year(s)	Equivalent Population
2010	2168 (1)
2010-2018 Residential Growth	345
2010-2018 ICI Growth	47
Total Existing	**2560**

Table 1 Notes:

1. From 2010 MSP.

3.2.3 Land Use and Existing Development

Existing land use in Jarvis consists of residential, industrial, institutional, and commercial uses. Since the completion of the 2010 MSP, in spite of an overall decline in population, approximately 5.9 ha (99 units) of low density residential land, 0.65 ha (24 units) of high density residential land, and 0.51 ha of commercial land has been developed. The distribution of existing development, highlighting new development since the 2010 MSP is provided in Figure 2.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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DEVELOPMENT FROM 2010 TO 2018

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FIGURE 2

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3.3 Environmental Features

3.3.1 Source Water Protection

Ontario's Clean Water Act provides the mandate for a provincial drinking water source protection program in Ontario. Its focus is on the protection of water sources for municipal drinking water systems, with additional attention to surface water and groundwater sources on the broader landscape.

The Long Point Region Source Protection Area Approved Source Protection Plan (the Source Protection Plan) released in 2015 identified Intake Protection Zones to protect the source water for municipal residential drinking water systems. Jarvis' drinking water comes from the Nanticoke Industrial Pump Station Intake at the Nanticoke WTP.

Changes near the intake at the Nanticoke WTP are beyond the scope of this study, and no part of the Intake Protection Zone (IPZ), or any other IPZ, is located within the study area boundary for this Master Plan and Class EA. As such, impacts to the IPZ are not anticipated as part of the alternatives considered.

3.3.2 Subsurface Natural Gas

As part of the Jarvis 2010 MSP, Stantec conducted a Methane Review in June 2009. The review followed two (2) separate house explosions that occurred in Jarvis between 1991 and 2009 as a result of the release of subsurface natural gas. The review conclusions showed that Jarvis is situated on highly fractured bedrock, providing an easy pathway for natural gas to reach the surface. Stantec concluded that the release and accumulation of natural gas is an ongoing threat in Jarvis.

3.3.3 Geology and Hydrogeology

Results of the Jarvis 2010 MSP indicate the area has a relatively flat landscape and the topography is divided into two (2) drain subwatersheds that drain to Jarvis Municipal Drain No. 1 and No. 2 respectively. It was found that overland drainage is generally restricted by the limited relief which results in flooding.

Information regarding soil in the Jarvis 2010 MSP was gathered from Ontario Soil Survey 57 – Regional Municipality of Haldimand-Norfolk. The soil survey conclusions showed the watershed soils are situated entirely on the poorly draining Haldimand Clay Plain, and site soils are primarily lacustrine heavy clay with limited infiltration capability.

The bedrock is shallow in several areas of Jarvis, including Municipal Drain No. 1. Portions of the channel bottom are formed by bedrock. The Jarvis 2010 MSP included a Canada Land Inventory (CLI) review that classified the soil in the urban boundary of Jarvis as Class 2D agricultural soil. Class 2 soils have moderate limitations and can be managed and cropped with little difficulty. Subclass D classifies undesirable soil structure and/or low permeability with critical clay contents in the upper soil profile.

Geotechnical or hydrological conditions in the study area are generally understood to be consistent with the 2010 MSP. Investigations should be completed prior to any construction to verify site specific conditions.

3.3.4 Natural Heritage

As part of the Jarvis 2010 MSP, Stantec conducted a Fisheries Habitat and Community Inventory Survey in June 2009. The survey concluded that Jarvis Municipal Drains No. 1 and 2 are classified as warm water intermittent systems, but only Jarvis Municipal Drain No. 1 was found to support direct fish habitat.

Stantec also completed a Vegetation Survey in 2009 as part of the Jarvis 2010 MSP that included a review of Long Point Region Conservation Authority (LPRCA) wetland/woodlot mapping for the study area, and an Ecological Land Classification field survey. The study concluded that 1) a large portion of Jarvis contained agricultural land, 2) there are two (2) different forest community types, 3) no wetland communities exist, and 4) all communities are considered provincially common.

All species observed are ranked S5 (secure) with the exception of black walnut S4 (apparently secure) which is noted as common in Haldimand County. No nationally, provincially, or locally rare, threatened, or endangered species were observed.

As part of the environmental features survey in the Jarvis 2010 MSP, Stantec conducted a review of the National Heritage Information Centre (NHIC), as well as Department of Fisheries and Oceans (DFO) databases to identify species at risk in the study area. None were identified within the Jarvis study area.

Based on the findings from these previous studies, the potential for disruption to the natural environment is relatively low. However, that should be confirmed prior to implementation of the preferred alternative, particularly if work in or near a watercourse is proposed.

3.3.5 Archaeological Resources

No archaeological studies were completed as part of the Jarvis 2010 MSP. It is recommended that if ground disturbance is associated with future developments, an archaeological assessment (Stage 1 or Stage 2) should be conducted by a licenced consultant archaeologist prior to implementation of the preferred alternative.

3.3.6 Cultural Heritage

No cultural heritage studies were completed as part of the Jarvis 2010 MSP. It is recommended that a Cultural Heritage Assessment Report be conducted prior to project implementation, if required.

3.3.7 Hydrologic Setting

Hydrologic setting details/information were established in the Jarvis 2010 MSP. One change to the established hydrologic setting is that Jarvis Municipal Drain No.2 now also flows through the Jarvis Meadows development to the south-east of Craddock Boulevard, as well as predominately agricultural and open space lands.

4.0 WATER SERVICING

4.1 Summary of Findings from the 2010 MSP

As part of the Stantec 2010 MSP Report, a hydraulic model was developed to analyze the existing water distribution system and aid in the selection of preferred future system upgrades. The hydraulic model was prepared using H2OMAP Water software with County Geographic Information Systems (GIS) information to provide a basis for model infrastructure.

Existing water demands were based on available metering records, while future demands were generated based on projected growth areas. Haldimand County Design Criteria was used to supplement unavailable water usage data.

Conclusions from the 2010 MSP Report found that the water pressures throughout the Jarvis water distribution system were acceptable. A watermain restriction was observed, however, near the intersection of Main Street and Boyd Street where the pipe diameter reduces to 200 mm diameter. The restriction creates a bottleneck that limits fire flows availability, but the limited flows remain within acceptable limits.

The report recommended a new 400 mm diameter watermain be constructed along Talbot and Main Street and connect to the existing 750 mm diameter watermain on Keith Richardson Parkway. This proposed watermain would add a secondary connection to the Nanticoke WTP and eliminate the bottleneck restriction near the Main and Boyd intersection.

The report also recommended construction of new watermains to service proposed growth areas as well as to those vacant lots that provide opportunities to loop the existing water distribution system.

4.2 Water Demand Update

4.2.1 Average Day Water Demand

A review of available flow data from 2013 to 2017 was conducted to confirm the estimated existing demand. Water demand in Jarvis is measured at the main meter, at the Jarvis water depot, and on a customer-by-customer basis at the point of use.

The average annual day flows from each recording device are summarized in Table 2.

Table 2 Historical Average Water Demand (2013-2017)

Year	Jarvis Main Meter (m^3/day)	Jarvis Internal Meters (m^3/day)	Jarvis Depot (m^3/day)	Jarvis Unaccounted (m^3/day)	Jarvis Unaccounted (%)
2013	637	353	198	86	14%
2014	651	477	187	81	12%
2015	640	441	269	65	10%
2016	709	--(1)	252	55	--(1)
2017	741	409	220	42	6%
Average (m^3/day)	676	420	225	66	10%
Average (L/s)	7.82	4.86	2.61	0.76	10%

Table 2 Notes:

1. Internal water meter read records were incomplete for 2016 and only included January and February. This year was removed from the calculation of the average meter readings and unaccounted water.

4.2.2 Maximum and Peak Hour Demand

Because maximum day and peak hour flows are not recorded at the Jarvis metering points, no further assessment could be made of those flows. In the following section, maximum day and peak hour demands are estimated based on peaking factors recommended by Haldimand County staff.

4.3 Updated System Information and Modelling

4.3.1 Water Distribution System Modelling

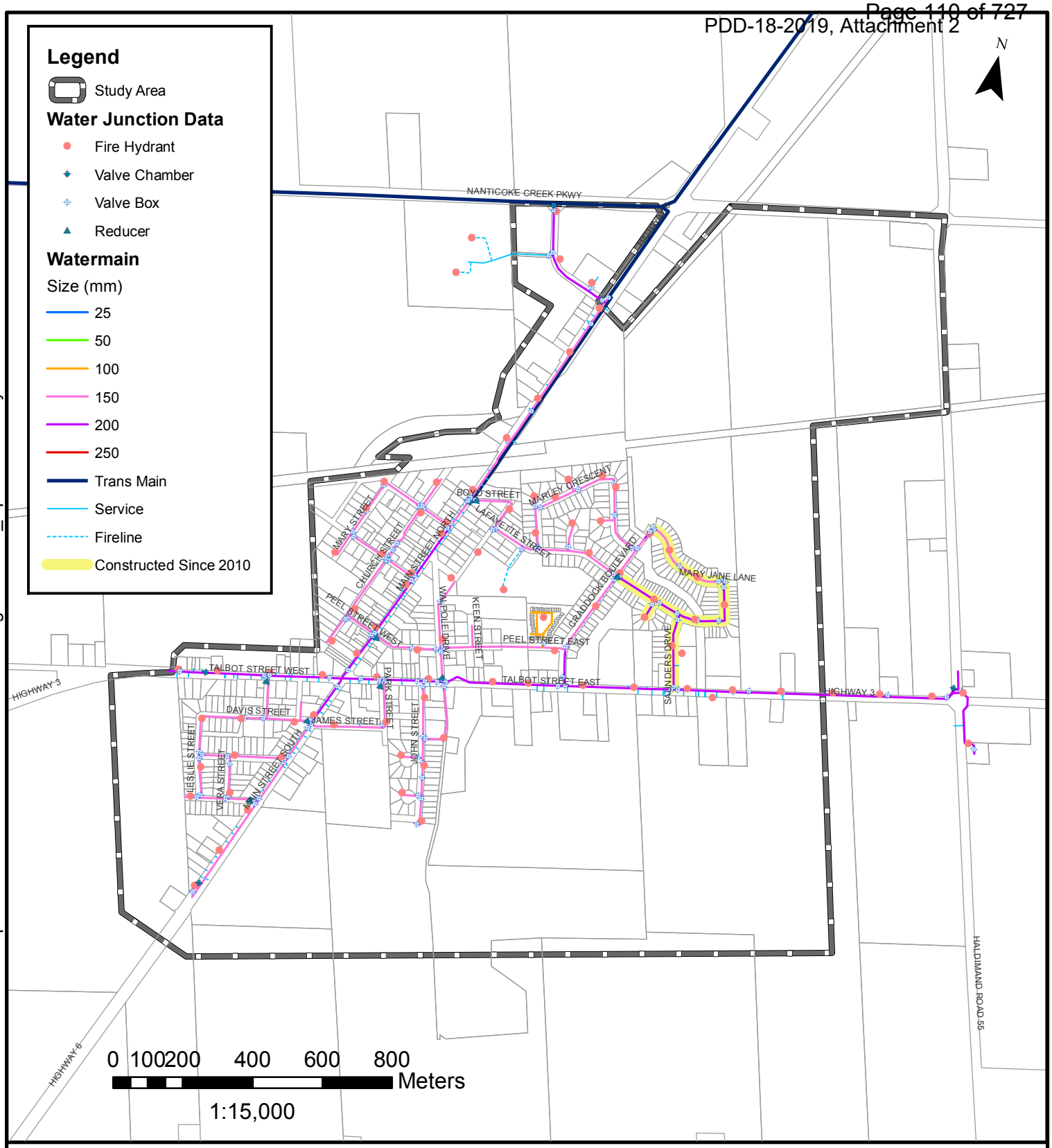
The water model was updated in the Innovyze modelling software, InfoWater as the software developer no longer supports the H20MAP platform used at the time of the 2010 MSP. All model inputs can be found in Appendix A.

4.3.2 Water Treatment Plant

Water for Jarvis is supplied by the Nanticoke WTP (which also supplies Hagersville, Townsend, and the Nanticoke Industrial Park) with a rated capacity of 13,625 m^3/day. As per discussions with the County, water supply was assumed to be adequate and was not further reviewed.

4.3.3 Water Distribution System

The County's GIS data was used to update the watermain in the InfoWater model and the existing water distribution system is shown in Figure 3. Watermain extensions or upgrades since the 2010 MSP are highlighted in yellow. No other major changes to the water distribution system were noted since completion of the 2010 MSP.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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UPDATES TO EXISTING WATER SYSTEM

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FIGURE 3

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4.3.4 Modelled Water Demand

Since the completion of the 2010 MSP, approximately 5.9 ha (99 units) of low density residential land, 0.65 ha (24 units) of high density residential and 0.51 ha of commercial land has been developed. To update the existing conditions in the model, the metered flow from each new parcel from 2017 was used. Metered flows were increased by 10% (per Table 1) to adjust for unaccounted water. Based on input from the County, the maximum day and peak hour factors used are maximum day factor of 2.0 and a peak hour demand factor of 3.0. This new demand was added to the 2010 MSP existing conditions water demand. The demand from the water depot has been updated to reflect average usage. The updated average, maximum, and peak water demands included in the model are summarized in Table 3.

Table 3 Summary of Modelled Water Demands (Existing)

Land Use	Average Day (L/s)	Maximum Day (L/s)	Peak Hour (L/s)
2010 Residential Demand	3.94	8.87	15.76
2010 ICI Demand	0.94	1.88	2.82
Water Depot	2.61	5.22	7.83
Additional Residential to 2017	0.39	0.79	1.18
Additional ICI to 2017 (1), (2)	0.006	0.012	0.018
Total 2017 Water Demand	**7.89**	**16.77**	**27.61**

Table 3 Notes:

1. Inconsistent internal meter records for Tim Hortons (2120 Main Street North) ICI development. Only internal meter records for August 2017 – December 2017 were included for average day flow calculation.

2. No internal meter records available for Motorcycle Sales & Service Operation (1 Talbot Street East) ICI development. Meter records for 2002 Main Street South (Neighbouring property owned by same company) were used in place.

As shown above the updated existing average, maximum, and peak water demands are estimated to be 7.89, 16.77, and 27.61 L/s, respectively. The updated average day demand is consistent with measured demand of 7.82 L/s noted in the previous section.

4.3.5 Storage Requirements

An elevated storage tank located at the north-east of Townsend provides storage for both Jarvis and Townsend. The storage volume provided by the tank is 2,300 m^3. Storage requirements were calculated based on the MECP (formally MOE) Design Guidelines for Drinking-Water Systems (2008), with fire storage requirements modified to assume that 50% of fire flow volume is pumped and the remainder is from storage. Using this approach adopted by Haldimand County, there is adequate storage to serve existing development. Table 4 summarizes the existing total water storage volume required for Jarvis, Townsend, and for overall.

Table 4 Existing Treated Water Storage Requirements

Area	Maximum Daily Demand (m^3/day)	Average Day Demand (m^3/day)	Equivalent Population	Fire Storage Volume Required (m^3) A	Equalization Storage (m^3) B	Emergency Storage (m^3) C	Total Water Storage Volume Required (m^3) A+B+C
Jarvis	1,449 (1)	681 (1)	2,560	372	362	184	918
Townsend	772 (2)	386 (2)	1,000 (3)	230	193	106	529
Total	**2,221**	**1,067**	**3,560**	**603**	**555**	**289**	**1,447**

Table 4 Notes:

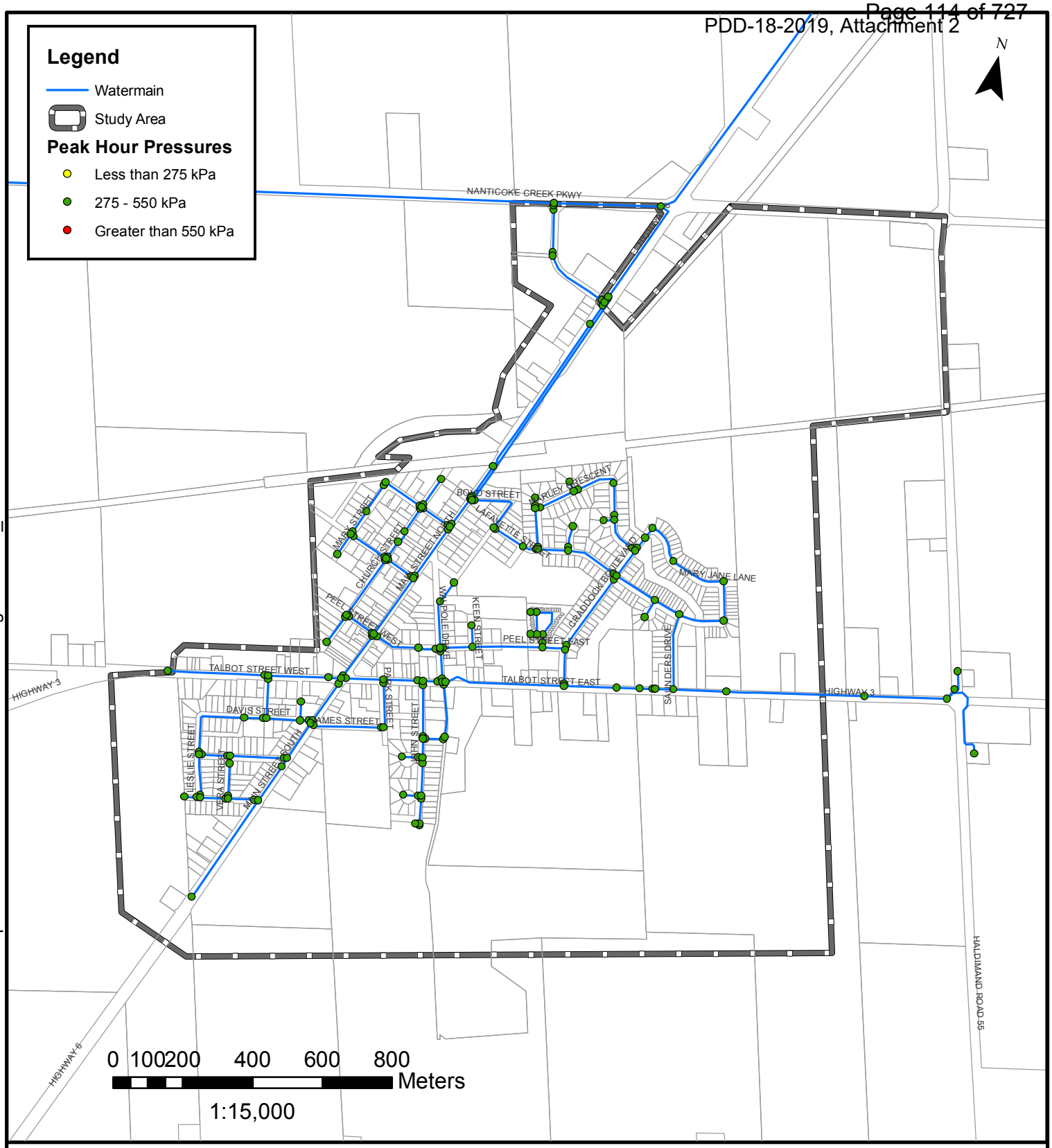
1. Refer to Table 3 for development of Jarvis maximum daily and average day demand. The maximum daily demand and average day demand includes Water Depot Demand of 5.22 L/s (451 m^3/day) and 2.61 L/s (226m^3/day) respectively.
2. Calculated Average Daily Demand using Townsend 2017 internal meter records and calculated Maximum Daily Demand using Maximum Day Factor of 2.0.
3. Townsend equivalent population from preliminary findings of Watson & Associates Economists Limited update for the Halidmand County Population, Housing and Employment Projections Study for 2016 to 2046 (Watson, 2018).

The existing storage capacity of the elevated storage tower is 2,300 m^3 and the existing storage capacity required is 1,447 m^3. The existing storage capacity provided is sufficient for the total required storage with available surplus.

4.4 Existing Water Servicing Conditions and Constraints

4.4.1 Service Pressure

No existing service pressure deficiencies were identified in Jarvis. Modeling results indicate that the system currently operates within the MECP recommended pressure range of 275 kPa to 550 kPa during the peak hour demand scenario. Existing system pressures are shown in Figure 4.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

SYSTEM PRESSURES UNDER PEAK HOUR DEMAND

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FIGURE 4

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4.4.2 Available Fire Flow

Existing fire flow availability in Jarvis was found to range between 33 L/s and 294 L/s during the maximum day demand scenario. Areas with low available fire flow are at the extremities (dead-ends) of the system, and include the Water Depot, located at 1342 Nanticoke Rd., Jarvis.

Table 5 presents a baseline for the percentage of junctions in the water model that are capable of meeting the indicated fire flow under existing conditions. Fire flow availability from the existing water distribution system is shown in Figure 5 .

The County is currently developing design criteria for minimum fire flow requirements for new developments. It is anticipated that that the minimum flow permitted will be approximately 160 L/s from two (2) adjacent hydrants (approximately 80L/s from each hydrant).

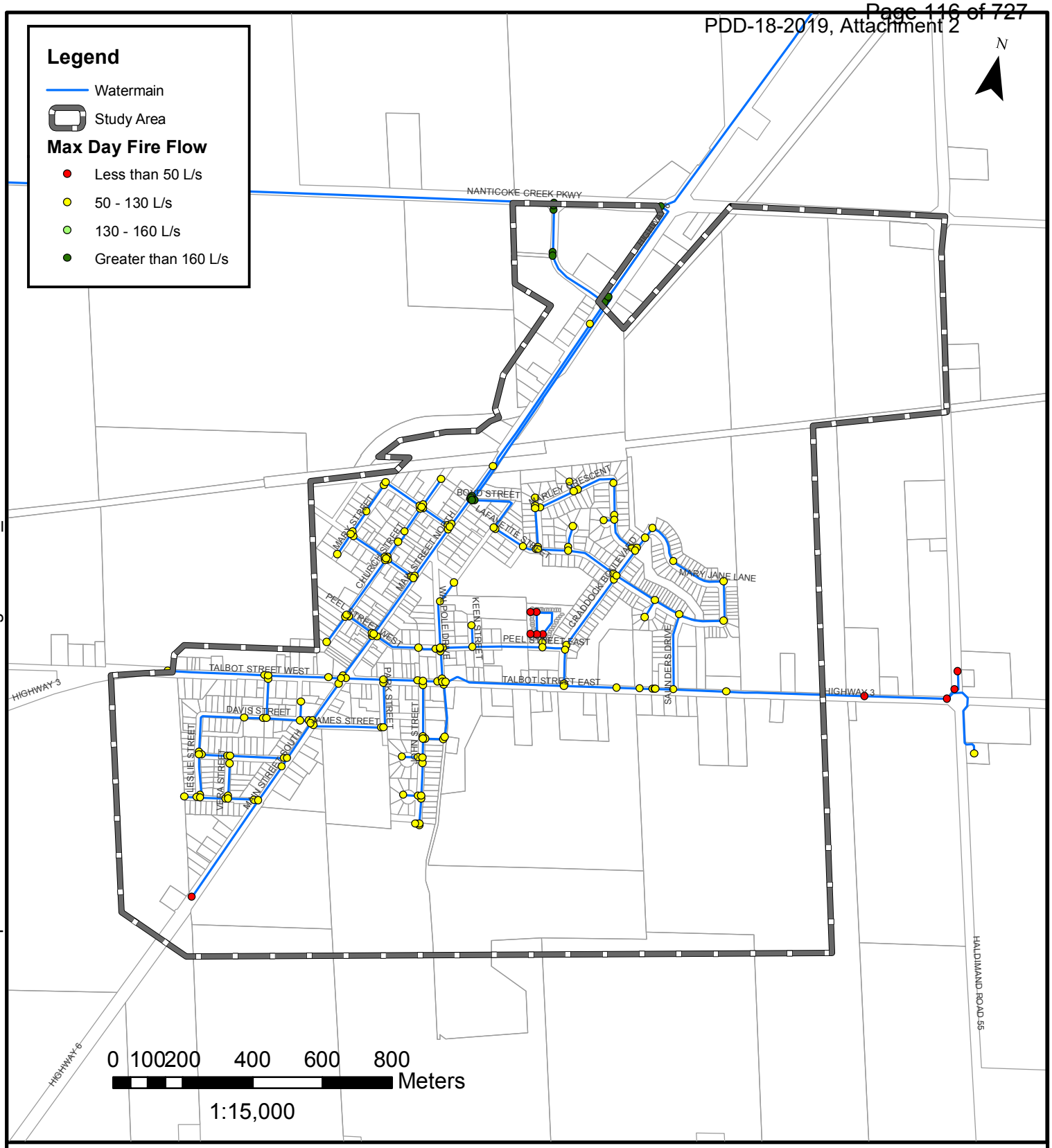
Approximately 40% of junctions are capable of meeting the proposed requirement of 80 L/s under existing conditions.

Table 5 Percentage of Junctions Capable of Meeting Fire Flow (2018)

EXISTING - Max Day + Fire Flow	
Fire Flow (L/s)	**Percentage (%) of Junctions Capable of Meeting the Fire Flow Indicated**
60	85.6%
80	39.4%
100	10.6%
150	9.6%
200	6.4%
250	3.2%

4.4.3 System Redundancy

As noted in the 2010 MSP, is a single connection via a 500 mm diameter transmission main provides water to Jarvis and Hagersville. The County may wish to consider an additional connection from the Nanticoke WTP to increase water supply redundancy and improve system looping.



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JARVIS MASTER SERVICING PLAN UPDATE

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AVAILABLE FIRE FLOW UNDER MAXIMUM DAY DEMAND

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FIGURE 5

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5.0 WASTEWATER SERVICING

5.1 Summary of Findings from 2010 Master Servicing Plan

As part of the 2010 MSP, a steady state simulation model was prepared using H2OMAP Sewer GIS Professional (Version 9.0) software. Infrastructure information was generated by means of a field survey of the wastewater collection system, which was supplemented as required by the County's GIS system, 'As-built' plan and profile drawings, design briefs, and partial Aqua Data GIS files. Flow rate data was calculated using results from the Inflow & Infiltration (I&I) study, following Haldimand County Design Criteria procedure. Future flows were generated using the Design Criteria.

Conclusions from the 2010 MSP found the wastewater collection system operates as designed for the majority of the year, with the exception of one (1) bottleneck that forms at the intersection of Talbot Street and Walpole Street. The report found that overloading of the Peel Street Sewer and portions of the Main Street Trunk occurs following spring freshet flows. There is significant demand on the collection system from additional inflow and infiltration sources particularly in the spring. The flow velocities were found to be for the most part acceptable except for select upstream areas with flat pipes and small drainage areas.

Overall, in the 2020 MSP, many areas of the wastewater collection system demonstrated capacity to accept future growth. Provided I&I reduction efforts are successful in reducing extraneous flows to system design levels, the wastewater system can accommodate peak design flows until 2018. Construction of the Municipal Drain No. 1 channel will also help to reduce amounts of extraneous flows entering the system.

5.2 Wastewater Flow Update

5.2.1 Average Wastewater Flow Rates

Since 2007, raw sewage flow to the lagoon has been measured by a magnetic flow meter. A new replacement magnetic flow meter was installed in April 2017 and in 2009, a Milltronic Multi-Ranger unit was installed to calculate flows based on the level in the pump wet well. In recent years, effluent flow has been measured by two (2) Palmer Bowlus Flumes, one for Cell No. 1 and/or 2 and one for Cell No. 3 and/or 4.

The average annual day flows from each recording device are summarized in Table 6.

Table 6 Historical Average Raw Sewage Flows (2013 – 2017)

Year	Magnetic Flow Meter (m^3/day)	Multi-Ranger Unit (m^3/day)	Palmer Bowlus Flumes (m^3/day) (1)
2013	887	623	739
2014	1295	594	945
2015	697	605	739
2016	691	553	583
2017	985	855	867
Average	911	646	775

Table 6 Notes:

1. Effluent flows measured by the Palmer Bowlus Flumes were adjusted by adding annual precipitation (from the Hamilton International Airport) and subtracting evaporation, estimated at 554 mm/year from CPO, Inc (2011).

In 2018, the Jarvis Lagoons Operation and Capacity Update study was conducted by Haldimand County to assess the capacity of the Jarvis Lagoons for re-rating (Haldimand County, 2018). The study reviewed historical average influent flow measurements and concluded that due to improper equipment installation, the flow measurement devices are unreliable and all the influent flow data is potentially inaccurate. The 2017 Magnetic Meter average day flow value appears to be representative of a wet year with a higher and more conservative estimate of the average day flow. As such, the 2017 Magnetic Meter average day flow volume of 985 m^3/day will be used for treatment system design purposes at the lagoon (documented in a separate Class EA report). Refer to section 5.3.5 for an estimation of existing wastewater collection system flows.

5.2.2 Maximum Day Wastewater Flow Rates

The maximum day flows from each recording device are summarized in the Table 7.

Table 7 Historical Maximum Day Raw Sewage Flows (2013 – 2017)

Year	Magnetic Flow Meter (m^3/day)	Multi-Ranger Unit (m^3/day)
2013	5210	1100
2014	5991	1065
2015	5620	9266
2016	4515	1070
2017	5363	2157 (1)
Average	5340	2932

Table 7 Notes:

1. Multi-Ranger Unit in 2017 had an error reading of 11,046 m^3/day as the maximum day raw sewage flow. This entry was excluded and the next highest maximum day raw sewage flow reading of 2157 m^3/day for 2017 was used.

For maximum day flow, the most accurate data is believed to be from the magnetic flow meter. The average maximum day flow is 5,340 m^3/day which will be used for treatment system design purposes at the lagoon (documented in a separate Class EA report).

5.3 Updated System Information and Modelling

5.3.1 Hydrologic and Hydraulic Modelling

PCSWMM was the preferred software used for model development. The 2010 MSP used H2OMAP Sewer GIS Professional for wastewater analysis, but this software is now obsolete. The selection of PCSWMM was based on cost efficiency and consistency with the stormwater modelling. It also uses the open-source EPA SWMM engine, which can be freely downloaded from the EPA website. PCSWMM also produces shapefiles, which can be exported and used in a GIS database. The SWMM engine can perform a steady state analysis as was accepted in 2010 as the study was primarily focussed on conveyance capacity and this remains the case.

Infrastructure attributes, including flow rates for existing areas, were entered into the model from the previous H2OMAP model. Flow rates for areas developed since 2010, specifically the Jarvis Meadows area, were calculated as per Section 5.1.1. Wastewater catchment areas for the Jarvis Meadows development were generated so that flows were assigned to the nearest upstream manhole. As per the 2010 MSP, extraneous flow allowances were calculated in the model using the design rate per hectare and multiplying by the contributing catchment area for each pipe section. All model inputs can be found in Appendix B.

5.3.2 Wastewater Treatment Lagoon

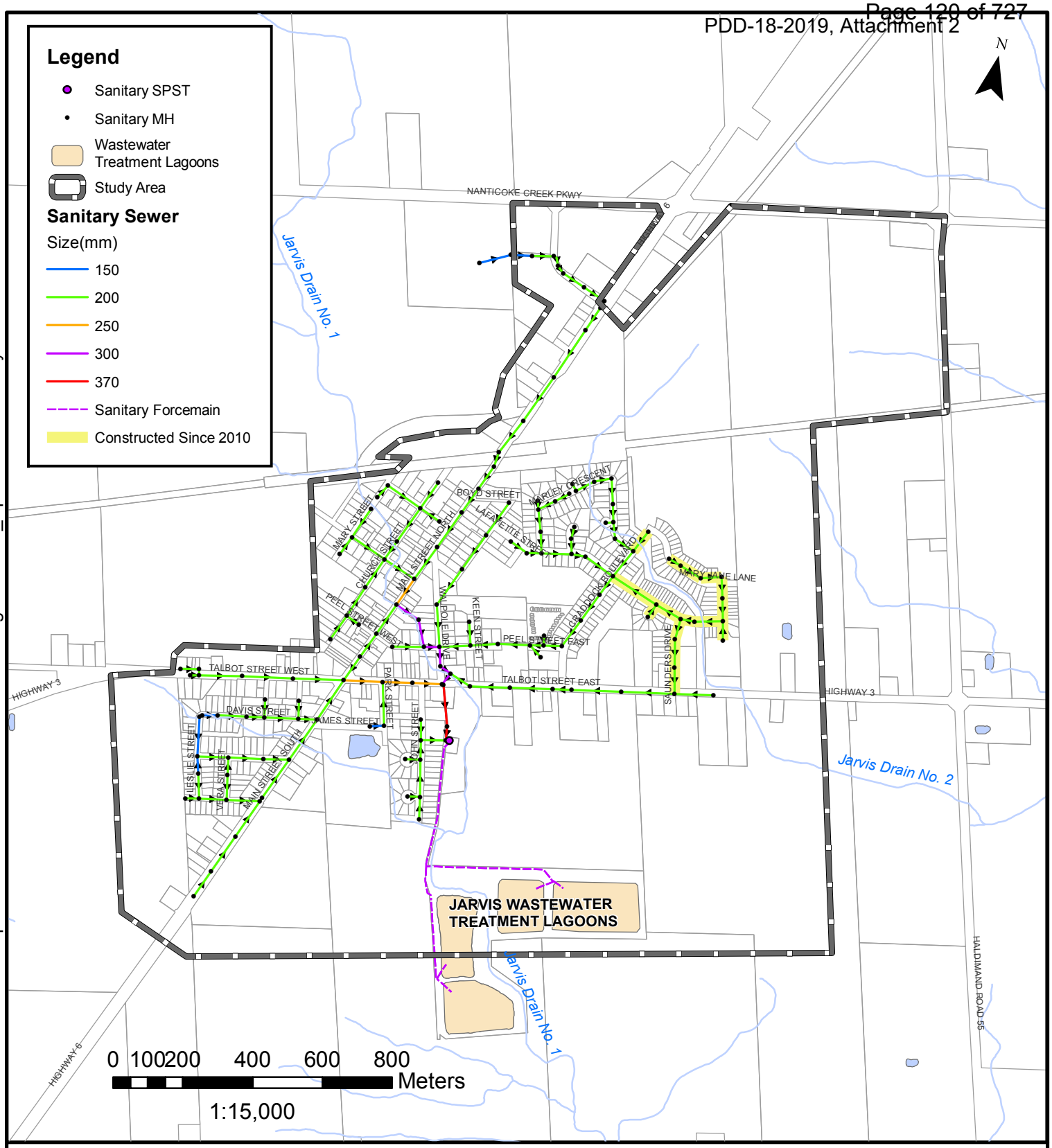
The gravity sewer network collects all sewage flow from the Jarvis community that is directed to the Jarvis Sewage Pumping Station (SPS) from which flow proceeds south via a 250 mm diameter forcemain to the Jarvis Wastewater Lagoons for treatment (rated capacity of 853 m^3/day). The Jarvis Treatment Lagoon system is being reviewed as part of a Class EA being conducted concurrently with this Master Plan update. Refer to Class EA documents for additional information about the Jarvis Treatment Lagoon.

5.3.3 Pumping Station

The Jarvis SPS is located south of Talbot Street and east of the access road. The station has three (3) submersible pumps, each with an approximate pumping capacity of 60 L/s. A pump has been upgraded since the 2010 MSP and the current the firm capacity of the SPS is 120 L/s.

5.3.4 Wastewater Collection System

The County's GIS data was used to update the sewermain in the model. There are six (6) primary sewersheds: Main Street North, Craddock Boulevard/Peel Street, Talbot Street West, Talbot Street East, Walpole Street/John Street, and Jarvis Meadows. The existing wastewater collection system is shown in Figure 6. Sewermains added or upgraded since the 2010 MSP are highlighted in yellow. There have been no other changes to the wastewater collection system since the 2010 MSP was completed.



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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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UPDATES TO EXISTING WASTEWATER COLLECTION SYSTEM

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FIGURE 6

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5.3.5 Modelled Wastewater Flows Collection System

Since the 2010 MSP, approximately 5.9 ha (99 units) of low density residential land, 0.65 ha (24 units) of high density residential land and 0.51 ha of commercial land has been developed. In the 2010 MSP, the existing wastewater flow rates were calculated using a uniform per capita generation rate and an equivalent population. To add wastewater flow on lands developed since 2010 into the model, the equivalent population for each residential parcel added since the 2010 MSP was calculated. The 2015 Haldimand County Design Criteria equivalent population density for single family home is 55 persons/ha (3 person/unit). Once equivalent populations for newly developed parcels were established, the total existing flow was determined as follows:

- The average dry weather flow was calculated for each new parcel using the per capita sewage generation rate from the 2010 MSP of 280 L/capita/day.
- Peaking factors, based on the Harmon formula, were then used to determine the peak flow rates generated from newly added and existing parcels.
- Wet weather flow rates were calculated by assuming an inflow and infiltration (I/I) rate of 0.23 L/s/ha per the 2015 Haldimand County Design.

The updated average, peaked dry weather, inflow and infiltration, and total peaked wet weather flow are summarized in Table 8

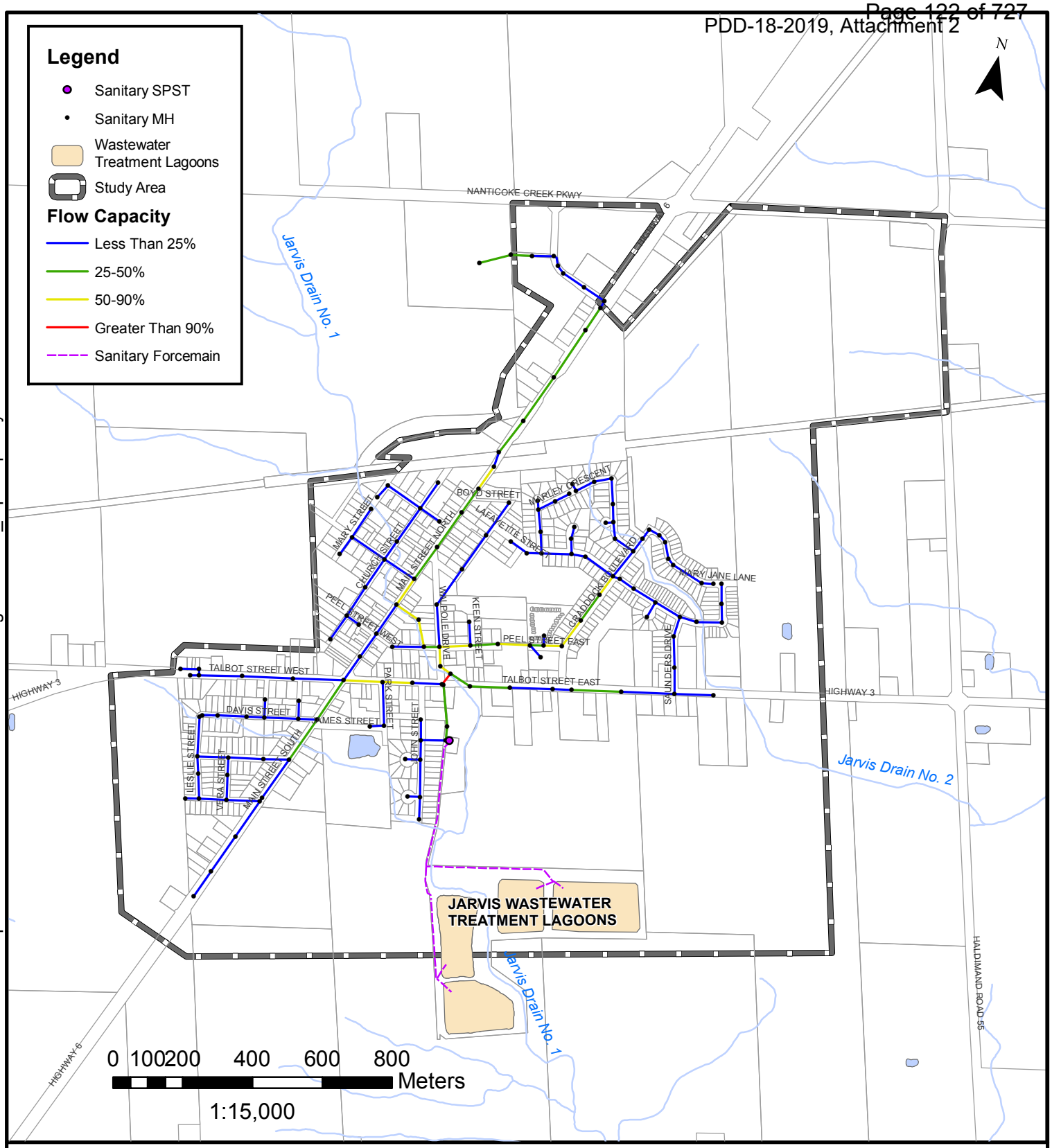
Table 8 Summary of Modelled Wastewater Flow (Existing)

Land Use	Average Day Dry Weather (L/s)	Peaked Dry Weather (L/s)	Inflow and Infiltration (L/s)	Total Peaked Wet Weather Flow (L/s)
2010 Residential & ICI Flow	7.3	25.9	25.0	50.9
Additional Residential to 2017	1.12	4.76	2.68	7.44
Additional ICI to 2017	0.15	0.64	0.96	1.60
Total 2017 Wastewater Flow	**8.56**	**31.3**	**28.7**	**60.0**

Using this approach the updated existing peaked wet weather wastewater flow rate is estimated to be 60.0 L/s (5,184 m^3/day). As noted in the 2010 MSP, actual I&I rates during the spring can be higher than the design value; however, for normal wet weather events the I&I rates are within the design range.

5.4 Existing Wastewater Servicing Conditions and Constraints

The modelling results show that the wastewater conveyance system appears to operate as intended with the exception of one location. There is a bottleneck in the system at the intersection of Talbot Street and Walpole Street, which accepts flow from the north and eastern portion of Jarvis. The surcharge experienced in the system during the design dry weather peak condition remains just above the pipe. The remainder of the system exhibits several locations where there is available residual capacity to accept growth. Velocities in the system under design conditions range from 0.15 m/s to 1.34 L/s, with the low velocities occurring in upstream areas where flat pipes and small drainage areas exist. Figure 7 shows the flow to pipe capacity ratio for the existing wastewater conveyance system.



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JARVIS MASTER SERVICING PLAN UPDATE

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FLOW TO PIPE CAPACITY RATIO

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6.0 STORMWATER

6.1 Summary of Findings from 2010 Master Servicing Plan

Stormwater servicing assessed as part of the 2010 MSP included conveyance infrastructure and stormwater management practices. Hydrologic and hydraulic modelling was completed using Wallingford Software (MWH-Soft) InfoWorks CS and generated GIS, field survey data and previous modeling files. The model was used to estimate stormwater runoff rates and the capacity of the storm sewer and drainage network. Conclusions from the 2010 MSP found that the stormwater drainage system functions as expected for regular rainfall events. Based on synthetic design rainfall events, the hydraulic modeling shows that the majority of the storm sewers are surcharged under the design 5-year event. The report found water to be contained below the surface for the 5-year event with the exception of three (3) locations where water surcharges to the surface: Marley/Craddock, Talbot Street East and Main Street North.

The report recommended a stormwater management servicing strategy for each development area in Jarvis, including conveyance and stormwater management practices to be implemented. Report recommendations included improvements to existing storm sewers to handle 5-year storm events, new stormwater sewers to serve future developed areas, and stormwater management facilities to improve water quality and limit peak flows within respective areas.

6.2 Updated System Information and Modelling

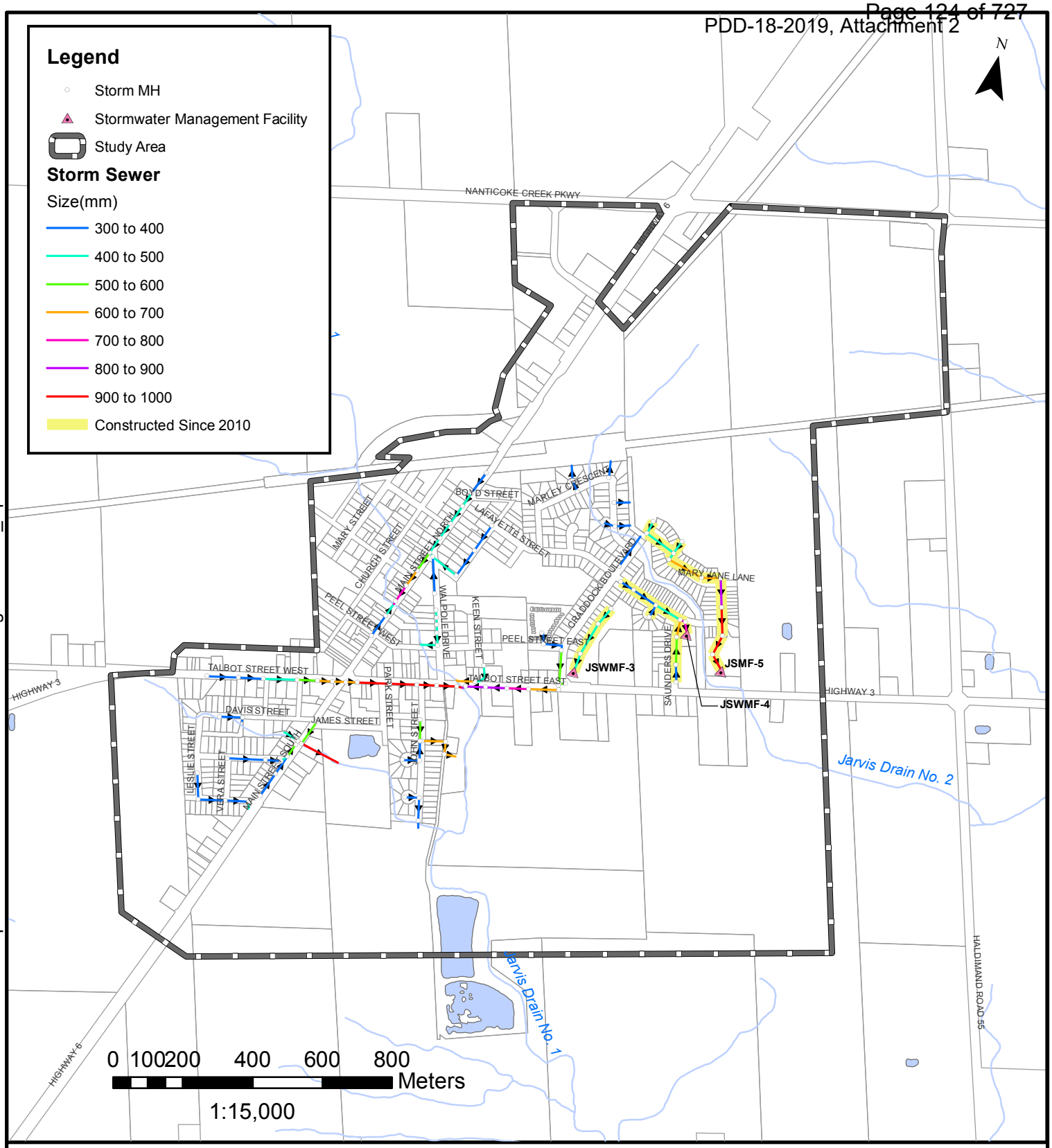
6.2.1 Hydrologic and Hydraulic Modelling

The computer simulation model was updated from the 2010 MSP and converted from the InfoWorks CS to PCSWMM. The PCSWMM modeling software uses the open source EPA SWMM 5.0 engine in a GIS environment. The model was constructed using the validated inputs from the 2010 Master Plan model with some updates.

The PCSWMM model was used to generate peak flows for the 2-year, 5-year, and 100-year design storm events. Jarvis was modeled using subcatchments, junctions, and conduits to represent the drainage areas, maintenance holes/inlets, storm sewers, culverts, roads, drains, and ditches. The drainage system was analyzed under existing conditions to determine where constraints exist. No flow monitoring was undertaken for the update. The general impervious land use characteristics have been updated to reflect the sub-area routing in the SWMM engine. No model verification was undertaken for the update. All parameters are from the previous model completed for the 2010 MSP that did go through a verification process. Detailed input files are found in Appendix C.

6.2.2 Stormwater Drainage System

The minor drainage system is intended to handle drainage from relatively frequent storms generally having a return period of less than five (5) years. These works typically consist of storm sewers and roadside ditches/swales. The existing stormwater drainage system is shown in Figure 8. Roads and drainage infrastructure added or upgraded since the 2010 MSP are highlighted in yellow.



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JARVIS MASTER SERVICING PLAN UPDATE

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UPDATES TO EXISTING STORMWATER DRAINAGE SYSTEM

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FIGURE 8

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6.2.3 Municipal Storm Drainage Infrastructure

The storm sewer system is divided into seven (7) main sewersheds. The Jarvis Meadows area to the south east of the town has been developed since the previous MSP in 2010. Both phases of the Jarvis Meadows residential subdivision outlet to Jarvis Municipal Drain No. 2, upstream of Talbot Street.

A storm sewer on the northeast side of the Jarvis Meadows area builds to a 900 mm diameter sewer, which discharges into a stormwater management facility to provide quantity and quality control prior to release into Jarvis Municipal Drain No. 2. Phase 2 of the development on the west side of Jarvis Municipal Drain No.2 drains via 675 mm diameter sewer to a Stormwater Management Facility which also provides quantity and quality control prior to discharging to Jarvis Municipal Drain No.2.

The Countryfield Estate property is a combined higher density residential and commercial site that drains westerly to Jarvis Municipal Drain No. 1. A 450 mm diameter storm sewer conveys flows from the development to a stormwater management facility, which provides quantity and quality control prior to discharge to Jarvis Municipal Drain No.1 via the existing storm sewers conveying flow west on Talbolt Street.

Four (4) stormwater management facilities are included in the model. Since Jarvis is mainly an older settlement that was constructed prior to the widespread implementation of integrated drainage design and SWM practices, there was only one (1) SWM facility included in the 2010 Master Plan. Three (3) SWM facilities have been constructed since 2010 and are included in the model using:

- Jarvis Meadows Phase 1 SWM Facility (JSWMF5) - Environmental Compliance Approval, Number 8730-A26JD4, Issue Date: September 10, 2015
- Jarvis Meadows Phase 2 SWM Facility (JSWMF6) - Certificate Of Approval, Municipal and Private Sewage Works, Number 7850-8C4K63, Issue Date: December 22, 2010
- Countryfield Estate SWM Facility (JSWMF6) – 2010 Master Plan Appendix I, SWMF Conceptual Sizing Calculations

6.3 Existing Stormwater Servicing Conditions and Constraints

6.3.1 Surcharge Under Rainfall Events (5-Year Storm)

In general, the existing stormwater servicing system operates as intended under everyday rainfall events. In comparison with design rainfall events, the majority of storm sewers are surcharged under the design 5-year event (refer to Figure 9); however, water is mostly contained below ground surface.

There are two (2) locations where water surcharges to the surface in the 5-year event, both of which are in the Marley/Craddock sewershed.

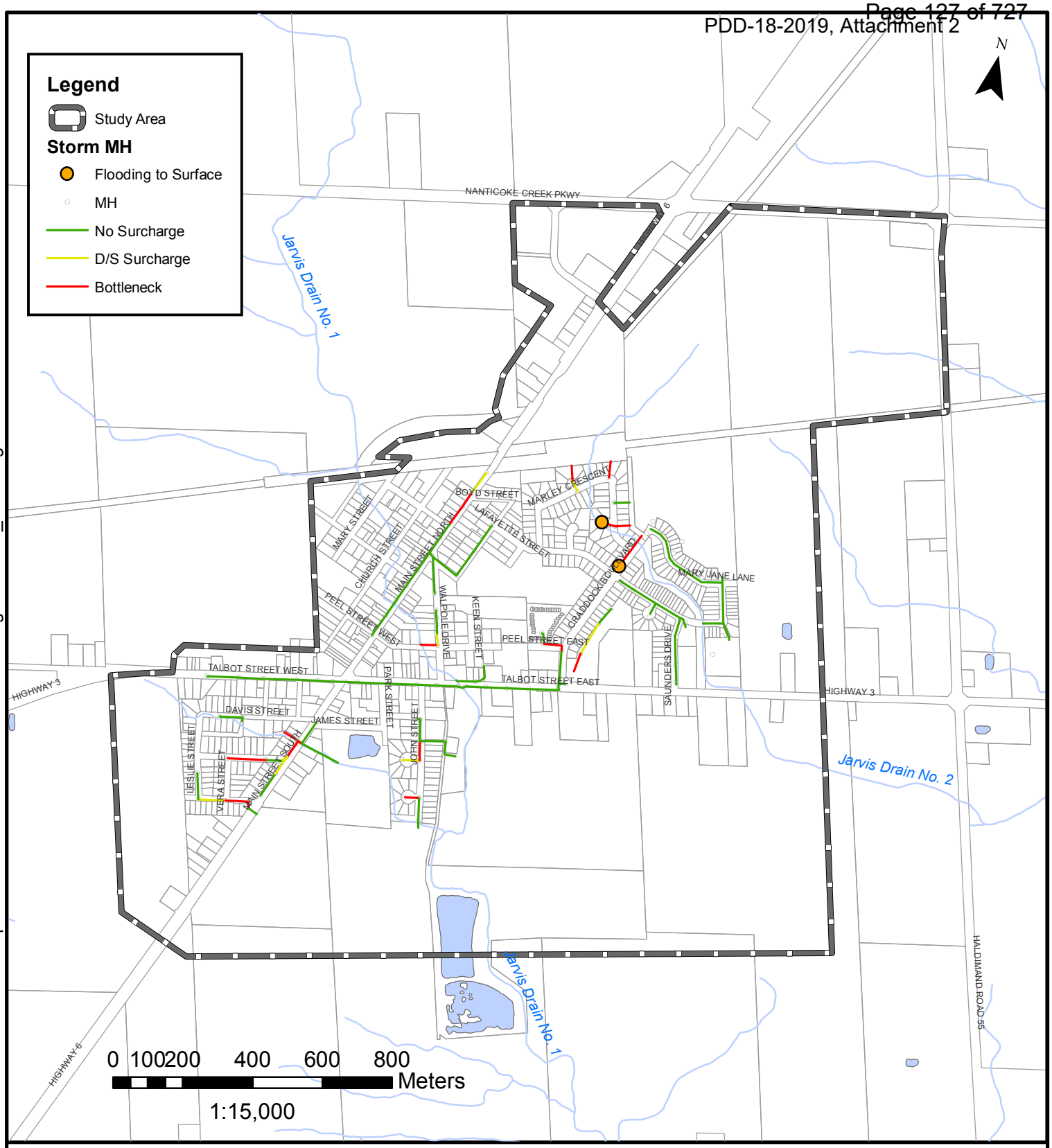
6.3.2 Flow to Pipe Capacity Ratio

As shown in Figure 10, two (2) independent inlets and sewers discharging to Jarvis Municipal Drain No. 1 on Cabot Court and Craddock Boulevard accept more inflow than the sewer capacity can handle, causing surcharge to the surface. In the case of Cabot Court, the road grade slopes away from Marley Crescent and traps overland drainage which sits and ponds over the inlet. The water level of Jarvis Municipal Drain No. 2 will also influence the ability for this sewer to outlet under extreme events. Surcharge occurs in the 2-year storm at Cabot, but does not flood the surface.

6.4 Limitations of Stormwater Modelling

The results of the PCSWMM model were compared to the 2010 MSP results for each subcatchment to confirm the appropriateness of the PCSWMM simulation. Most of the subcatchments have runoff values similar to the previous model. Due to differences in the simulation of minor system capture via catchbasins in the PCSWMM model, there are slight differences in the results of the modelling, however overall the results are consistent with those of the 2010 MSP model. Further details are included in Appendix C.

It is noted that this MSP was not conducted as a subwatershed study and is intended to address the storm sewer conveyance and SWM servicing requirements to accommodate future development. While background information was reviewed, detailed water quality, fluvial geomorphology, and floodplain analyses were out of scope for this MSP that primarily focused on the urban drainage conveyance systems. Any future watershed or subwatershed planning on the Jarvis Municipal Drains will further augment and/or supersede the recommendations presented herein.



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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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SURCHARGE TO SURFACE MAP UNDER 5-YEAR

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FIGURE 9

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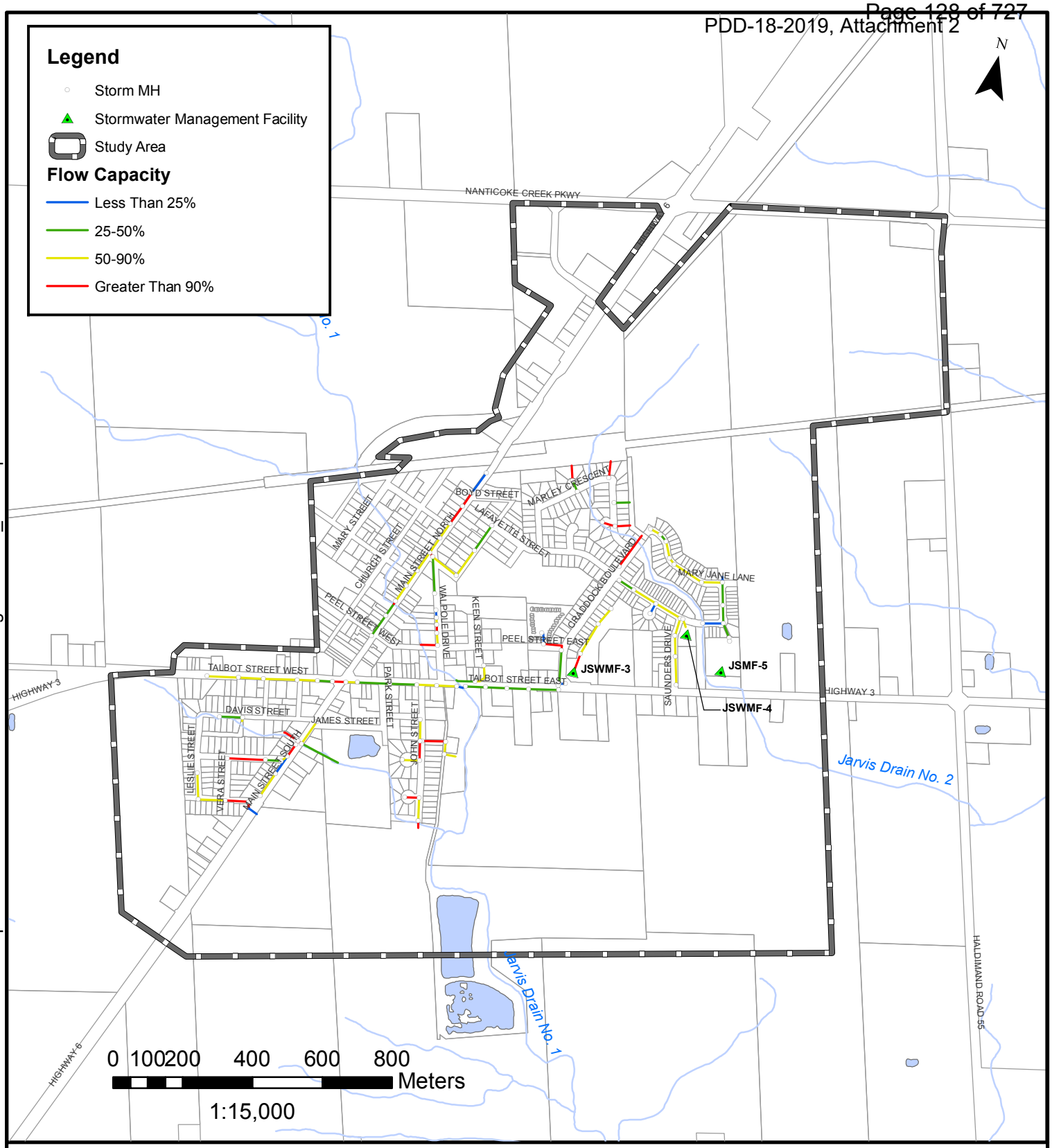

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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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FLOW TO PIPE CAPACITY RATIO

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FIGURE 10

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7.0 TRANSPORTATION SERVICING

The study area intersections were analyzed under existing traffic conditions, using Synchro 9.2 software which implements Highway Capacity Manual (HCM) 2000 procedures. The results indicate the study area intersections are operating with acceptable levels of service and well within capacity. No critical movements are identified at any of the study intersections.

Please refer to Appendix D for the full report.

8.0 CONCLUSION

This Work Package has been prepared for the exclusive use of Haldimand County, for the stated purpose. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Haldimand County and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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Reviewed by

Michael Troop, P.Eng.
Senior Environmental Engineer

9.0 REFERENCES

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Appendix A

Water Model Parameters

28176 Jarvis - EXISTING - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	NANT_04	0.000000	260.000000	254.283661	-56.015629
2	☐	NANT_03	0.000000	260.000000	254.415390	-54.724766
3	☐	NANT_02	0.000000	260.000000	254.428085	-54.600437
4	☐	NANT_01	0.000000	260.000000	259.987732	-0.120139
5	☑	60V0030-B	0.000000	217.500015	253.183914	349.674255
6	☑	60DEPO01	20.999851	209.307343	245.573532	355.380096
7	☑	60V0108-B	0.000000	217.000000	253.270905	355.426270
8	☑	60V0050	0.000000	216.484467	253.263885	360.409363
9	☑	60D0016	0.525424	213.013535	250.084290	363.264191
10	☑	60V0108	0.000000	216.121643	253.268265	364.007599
11	☑	60V0060	0.000000	215.645859	253.222580	368.222198
12	☑	60T0102	0.000000	215.500000	253.115417	368.601440
13	☑	60V0008	0.000000	215.500000	253.117874	368.625519
14	☑	60V0067	0.000000	215.500000	253.119339	368.639923
15	☑	60T0101	0.029824	215.500000	253.123978	368.685303
16	☑	60V0044	0.000000	212.000015	249.625183	368.697052
17	☑	60T0073	0.263026	212.000015	249.631699	368.761047
18	☑	60T0104	0.000000	215.565323	253.217834	368.964874
19	☑	60V0043	0.000000	212.000015	249.694229	369.373749
20	☑	60T0115	0.170255	211.933945	249.631668	369.407959
21	☑	60T0114	0.149255	212.000015	249.702515	369.454895
22	☑	60V0042	0.000000	212.000015	249.702545	369.455261
23	☑	60T0071	0.199511	211.944672	249.702560	369.997742
24	☑	60V0004	0.000000	209.500000	247.302719	370.436768
25	☑	60V0045	0.389853	211.650864	249.568115	371.559204
26	☑	60D0013	0.023168	208.500000	246.476120	372.136047
27	☑	60CHAM01	0.000000	208.500000	246.476120	372.136047
28	☑	60T0110	0.000000	208.500000	246.476120	372.136047
29	☑	60T0117	0.209351	211.500000	249.527527	372.639771
30	☑	60T0066	0.000000	211.500000	249.527603	372.640503
31	☑	60V0046	0.088523	211.500000	249.532623	372.689728
32	☑	60V0068	0.000000	215.000000	253.128540	373.629578
33	☑	60T0116	0.196119	211.500000	249.667847	374.014862
34	☑	FUT14	0.003402	211.059418	249.409836	375.803894
35	☑	60V0047	0.210687	211.116364	249.495087	376.081177
36	☑	60T0094	0.040812	212.304474	250.770035	376.932190
37	☑	60T0065	0.000000	211.020187	249.491547	376.988983
38	☑	60V0048	0.000000	211.000000	249.488831	377.160187
39	☑	60T0063	0.113255	211.000000	249.491547	377.186798
40	☑	60V0037	0.135650	211.000000	249.495651	377.227112
41	☑	FUT22	0.123275	210.930786	249.431595	377.277496
42	☑	60V0038	0.341278	211.000000	249.502548	377.294556
43	☑	60V0030	0.057428	214.500000	253.067383	377.929962
44	☑	60T0050	0.000000	210.668259	249.294205	378.503784
45	☑	60T0049	0.000000	210.651367	249.294205	378.669312
46	☑	J10	0.021852	210.809509	249.476028	378.901337
47	☑	60V0039	0.000000	211.000000	249.667984	378.915741
48	☑	60T0068	0.300550	211.000000	249.668015	378.916107
49	☑	60V0005	0.000000	210.582504	249.300674	379.407715
50	☑	FUT30	0.064719	210.500015	249.239151	379.613159

28176 Jarvis - EXISTING - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
51	✓	60T0052	0.256440	209.935852	248.696289	379.821686
52	✓	60V0041	0.000000	210.945236	249.777496	380.525726
53	✓	60V0006	0.666901	210.500015	249.338028	380.582092
54	✓	60T0118	0.268618	210.912445	249.781860	380.889587
55	✓	FUT20	0.121595	210.557388	249.431610	380.936707
56	✓	60V0040	0.000000	210.926422	249.802582	380.955688
57	✓	FUT92	0.000000	210.500015	249.412903	381.315826
58	✓	FUT26	0.056265	210.504349	249.447510	381.612457
59	✓	60T0069	0.065536	210.950851	249.939346	382.056580
60	✓	60T0009	0.277510	210.987991	250.058411	382.859344
61	✓	60V0017	0.000000	211.000000	250.085327	383.005463
62	✓	60V0098	0.000000	210.954376	250.058411	383.188751
63	✓	60V0099	0.573160	210.934845	250.058533	383.381226
64	✓	FUT18	0.065823	210.248367	249.403275	383.687347
65	✓	60T0017	0.273888	210.923599	250.085373	383.754486
66	✓	60V0016	0.000000	210.902222	250.084473	383.955383
67	✓	60D0008	0.000000	210.195251	249.478119	384.941132
68	✓	60D0004	0.000000	210.773239	250.057999	384.959747
69	✓	60V0065	0.000000	210.509949	250.058029	387.539948
70	✓	FUT28	0.126470	209.834488	249.396133	387.672882
71	✓	60V0095	0.000000	210.474167	250.058365	387.893860
72	✓	60V0066	0.000000	210.466293	250.057999	387.967560
73	✓	60T0006	0.269718	210.453217	250.057999	388.095673
74	✓	60T0060	0.000000	210.003021	249.622437	388.239227
75	✓	60T0010	0.401197	210.391907	250.058365	388.699951
76	✓	60V0033	0.000000	210.607468	250.288727	388.845215
77	✓	60T0077	0.432645	210.591934	250.311447	389.219879
78	✓	60V0096	0.000000	210.312668	250.058289	389.475677
79	✓	60V0064	0.000000	210.300110	250.057983	389.595856
80	✓	60V0063	0.400913	210.278503	250.057983	389.807739
81	✓	60D0019	0.000000	209.826233	249.622437	389.971466
82	✓	60T0004	0.000000	210.257309	250.057983	390.015259
83	✓	60V0087	0.225046	210.174545	250.069748	390.941650
84	✓	60V0029	0.277210	212.792007	252.695679	391.024750
85	✓	60T0014	0.226118	210.042816	250.074539	392.279358
86	✓	60V0020	0.000000	210.038116	250.073395	392.314148
87	✓	60D0002	0.000000	210.000000	250.058075	392.537598
88	✓	60V0036	0.259490	209.404602	249.579697	393.684357
89	✓	60V0062	0.000000	209.811752	250.058060	394.382111
90	✓	60T0002	0.313392	209.763763	250.058075	394.852539
91	✓	60D0009	0.072495	209.571365	249.914261	395.328644
92	✓	60T0058	0.000000	209.218567	249.622437	395.926086
93	✓	60V0081	0.000000	210.039459	250.457016	396.060181
94	✓	60T0059	0.000000	209.192245	249.622437	396.184052
95	✓	60T0096	0.572064	210.492371	250.934540	396.301575
96	✓	60D0007	0.079533	210.000000	250.457001	396.446655
97	✓	60V0027	0.000000	210.451721	250.922134	396.578308
98	✓	60V0026	0.000000	210.392151	250.920334	397.144409
99	✓	60V0103	0.000000	210.554169	251.094086	397.259247
100	✓	60T0023	0.098307	209.500000	250.046005	397.318909

28176 Jarvis - EXISTING - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
101	✓	60V0011	0.000000	209.491943	250.046707	397.404785
102	✓	60T0085	0.199213	209.892593	250.457031	397.499664
103	✓	60V0082	0.000000	209.867691	250.447845	397.653473
104	✓	60T0047	0.216938	208.974655	249.585190	397.951294
105	✓	60V0056	0.000000	208.969894	249.585220	397.998291
106	✓	60T0045	0.000000	208.958603	249.585648	398.113098
107	✓	60T0080	0.131041	209.646225	250.306290	398.436554
108	✓	60D0020	0.000000	208.939255	249.622437	398.663147
109	✓	60T0044	1.526909	208.906113	249.622437	398.987915
110	✓	60V0014	0.000000	209.367783	250.093307	399.078094
111	✓	60V0052	0.000000	208.896820	249.622437	399.079102
112	✓	60T0015	0.000000	209.257446	250.076065	399.990326
113	✓	60V0015	0.000000	209.211105	250.092926	400.609589
114	✓	60V0013-B	0.000000	209.199997	250.095032	400.739044
115	✓	60V0013	0.221216	209.184113	250.104202	400.984741
116	✓	60V0091	0.000000	209.817917	250.770050	401.298645
117	✓	60V0019	0.000000	209.098526	250.059662	401.386841
118	✓	60V0012	0.000000	209.109009	250.089661	401.578156
119	✓	60V0092	0.000000	209.743240	250.768173	402.012024
120	✓	60T0091	0.179135	209.706726	250.770050	402.388397
121	✓	60V0090	0.000000	209.683838	250.781433	402.724091
122	✓	60D0021	0.148371	208.929535	250.075974	403.202667
123	✓	60V0089	0.000000	209.558136	250.765854	403.803253
124	✓	60V0018	0.000000	208.859222	250.076736	403.899353
125	✓	60T0090	0.215738	209.472870	250.732071	404.307587
126	✓	60V0105	0.000000	208.740967	250.072891	405.020264
127	✓	60V0097	0.000000	208.723145	250.059937	405.068024
128	✓	60V0034	0.149855	208.878708	250.221344	405.125275
129	✓	60V0076	0.000000	209.347702	250.729889	405.512817
130	✓	60V0028	0.000000	211.093811	252.481842	405.570038
131	✓	60T0098	0.404153	211.190002	252.626999	406.049927
132	✓	60T0013	0.382733	208.588837	250.060028	406.385040
133	✓	60V0106	0.000000	208.597763	250.072159	406.416412
134	✓	60T0016	0.108289	208.595398	250.077011	406.487183
135	✓	60T0113	0.000000	211.122955	252.624100	406.678497
136	✓	60T0021	0.121303	208.500000	250.055817	407.214203
137	✓	60V0107	0.000000	208.500000	250.056366	407.219666
138	✓	60V0021	0.000000	208.744949	250.332352	407.523773
139	✓	60T0097	0.000000	211.058395	252.653076	407.595154
140	✓	85CHAM01	0.000000	211.054688	252.653076	407.631470
141	✓	60V0022	0.000000	208.706741	250.345612	408.028168
142	✓	60T0038	0.243002	208.248505	249.914291	408.291901
143	✓	60V0093	0.000000	208.294495	249.988647	408.569855
144	✓	60V0023	0.000000	208.613220	250.323273	408.725647
145	✓	60T0036	0.361157	208.601425	250.343048	409.035004
146	✓	60V0007	0.000000	211.054688	252.931259	410.357391
147	✓	60V0069	0.000000	208.019089	249.977966	411.164124
148	✓	60T0024	0.315340	207.831192	249.979538	413.020538
149	✓	60V0035	0.000000	207.715210	250.051071	414.858032
150	✓	60T0087	0.054200	208.223663	250.685684	416.094391

28176 Jarvis - EXISTING - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
151	✓	60T0040	0.000000	207.551987	250.058853	416.533844
152	✓	60T0039	0.210691	207.459885	250.059052	417.438202
153	✓	60V0032	0.000000	208.000000	250.683609	418.265656
154	✓	60T0088	0.148523	208.000000	250.685699	418.286255
155	✓	60V0104	0.000000	208.000000	250.688187	418.310516
156	✓	60V0080	0.000000	207.292313	250.052170	419.012817
157	✓	60V0049	0.209247	207.944290	250.719589	419.164154
158	✓	60V0079	0.000000	207.194122	250.073563	420.184692
159	✓	60V0077	0.149999	207.816422	250.705551	420.279846
160	✓	60V0009	0.000000	207.053787	249.965530	420.501373
161	✓	60V0074	0.000000	207.000000	249.956482	420.939667
162	✓	60V0073	0.000000	207.000000	249.956573	420.940582
163	✓	60T0031	0.149799	207.000000	249.956619	420.940948
164	✓	60V0071	0.000000	207.000000	249.958084	420.955353
165	✓	60T0029	0.234978	207.000000	249.958267	420.957184
166	✓	60T0108	0.255054	206.997284	249.956436	420.965759
167	✓	60V0070	0.000000	207.000000	249.959198	420.966278
168	✓	60T0027	0.000000	206.985001	249.956635	421.088104
169	✓	60V0102	0.000000	206.950684	249.956833	421.426422
170	✓	60V0078	0.000000	207.000000	250.128052	422.620850
171	✓	60V0025	0.000000	207.510071	250.668793	422.921509
172	✓	60V0051	0.000000	206.792816	249.952972	422.935486
173	✓	60T0081	0.439407	207.435562	250.657608	423.542053
174	✓	60V0024	0.000000	207.433746	250.657730	423.560913
175	✓	60T0112	0.000000	207.463470	250.691299	423.598694
176	✓	60T0025	0.269240	206.671402	249.961014	424.203979
177	✓	60T0026	0.000000	206.635651	249.952728	424.473206
178	✓	60V0010	0.000000	206.603424	249.970245	424.960754
179	✓	60V0086	0.000000	207.281921	250.660355	425.074554
180	✓	60V0072	0.000000	206.561234	249.955643	425.231049
181	✓	60V0085	0.000000	207.242386	250.662231	425.480225
182	✓	60T0083	0.255014	207.215729	250.659119	425.710999
183	✓	60D0006	0.000000	206.506790	249.955643	425.764557
184	✓	60V0031	0.000000	207.189072	250.652985	425.912231
185	✓	60V0072-B	0.000000	206.475525	249.955643	426.070923
186	✓	60V0100-B	0.000000	206.467896	249.955643	426.145691
187	✓	60V0084	0.000000	207.131897	250.659012	426.531403
188	✓	60T0032	0.159695	206.390778	249.955643	426.901367
189	✓	60V0100	0.000000	206.381790	249.955643	426.989471
190	✓	60V0101	0.000000	206.339981	249.955612	427.398773
191	✓	60T0107	0.266822	206.270767	249.955460	428.075562
192	✓	65WBS01	34.499756	209.000015	252.852325	429.718231
193	✓	TOWNSEND_01	47.999660	209.000015	254.157959	442.512390

28176 Jarvis - EXISTING - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
1	☐	60D0019	89.999359	35.554634	137.862915	137.860916	60D0019	137.862915	223.895004
2	☐	60T0060	89.999359	38.743347	137.862915	137.861145	60T0060	137.862915	224.071777
3	☐	60D0020	89.999359	39.183861	137.862915	137.861267	60D0020	137.862915	223.008026
4	☐	60CHAM01	89.999359	40.427551	137.862915	146.369492	60DEPO01	129.394455	222.511932
5	☐	60T0110	89.999359	40.427578	137.862915	149.844437	60DEPO01	125.777473	222.142822
6	☐	60D0013	90.025429	40.453590	137.862915	140.216980	60DEPO01	135.511337	223.136154
7	☐	60D0002	89.999359	40.687832	137.862915	137.862213	60D0002	137.862915	224.068787
8	☐	60T0059	89.999359	43.243244	137.862915	137.860992	60T0059	137.862915	223.261017
9	☐	60V0004	89.999359	45.792122	137.862915	143.923569	60DEPO01	131.748718	222.752167
10	☐	60T0058	89.999359	46.392704	137.862915	145.548203	60T0060	130.176041	223.287338
11	☐	60DEPO01	103.999260	50.026215	137.862915	137.986877	60DEPO01	137.862915	223.376114
12	☐	60V0072-B	89.999359	50.157124	137.862915	137.862350	60V0072-B	137.862915	220.544312
13	☐	60V0072	89.999359	50.268768	137.862915	137.861084	60V0072	137.862915	220.630020
14	☐	60D0006	89.999359	50.546635	137.862915	137.861496	60D0006	137.862915	220.575562
15	☐	60V0100-B	89.999359	50.716194	137.862915	138.775879	60V0072	136.948288	220.536682
16	☐	60T0107	90.149445	53.032333	137.862915	137.862244	60T0107	137.862930	220.339539
17	☐	60V0100	89.999359	55.684406	137.862915	139.621384	60V0072	136.104507	220.450562
18	☐	60V0101	89.999359	55.840473	137.862915	137.861008	60V0101	137.862930	220.408768
19	☐	60T0032	90.089188	56.412308	137.862915	139.532150	60V0072	136.192596	220.459549
20	☐	60T0115	90.095131	56.825520	137.862915	137.860687	60T0115	137.862930	226.002731
21	☐	60D0004	89.999359	57.333740	137.862915	137.861450	60D0004	137.862930	224.842026
22	☐	60T0116	90.109680	57.541771	137.862915	137.860474	60T0116	137.862930	225.568787
23	☐	60V0052	89.999359	58.537735	137.862915	148.701263	60T0060	127.023026	222.965576
24	☐	60T0117	90.117126	58.828690	137.862915	137.860245	60T0117	137.862930	225.568787
25	☐	60D0016	90.294914	58.967121	137.862915	137.860565	60D0016	137.862930	227.082306
26	☐	60T0114	90.083321	59.315521	137.862915	137.861389	60T0114	137.862930	226.068771
27	☐	60V0044	89.999359	59.953796	137.862915	137.860184	60V0044	137.862930	226.068771
28	☐	60T0073	90.147316	60.269714	137.862915	137.861008	60T0073	137.862930	226.068771
29	☐	60V0045	90.218658	60.567242	137.862915	137.860550	60V0045	137.862930	225.719635
30	☐	60T0108	90.142830	60.718586	137.862915	138.286926	60T0108	137.862930	221.066055
31	☐	60T0052	90.236000	60.812786	137.862915	146.151840	60DEPO01	129.566071	222.529434
32	☐	60D0009	90.040138	60.962345	137.862915	137.861740	60D0009	137.862930	223.640121
33	☐	60V0066	89.999359	61.354588	137.862915	140.869659	60D0004	134.855087	224.535080
34	☐	60V0042	89.999359	62.178154	137.862915	137.860367	60T0114	137.862823	226.068771
35	☐	60V0046	90.049156	62.240135	137.862915	137.860764	60V0046	137.862930	225.568787

28176 Jarvis - EXISTING - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
36	☐	60T0066	89.999359	62.586231	137.862915	137.860916	60T0117	137.862671	225.568741
37	☐	60T0002	90.190239	62.748310	137.862915	140.595032	60D0002	135.547989	223.832535
38	☐	60T0006	90.151077	62.805202	137.862915	140.997025	60D0004	134.726959	224.522003
39	☐	60V0043	89.999359	62.818447	137.862915	137.860764	60V0043	137.862930	226.068771
40	☐	60V0065	89.999359	62.942307	137.862915	138.802460	60D0004	136.927917	224.746597
41	☐	60V0062	89.999359	62.994846	137.862915	138.283875	60V0062	137.862930	223.880539
42	☐	60T0071	90.111588	63.514038	137.862915	138.403671	60T0114	137.320465	226.013428
43	☐	60V0064	89.999359	64.316223	137.862915	138.262009	60V0064	137.862930	224.368896
44	☐	60V0063	90.224876	64.632530	137.862915	138.241379	60V0063	137.862930	224.347260
45	☐	60T0004	89.999359	64.642685	137.862915	138.252701	60T0004	137.862930	224.326080
46	☐	60T0094	90.045273	64.964897	137.862915	138.109055	60T0094	137.862930	226.373260
47	☐	60V0096	89.999359	65.018875	137.862915	138.242752	60V0096	137.862930	224.381454
48	☐	FUT26	90.036873	65.173729	137.862915	137.861252	FUT26	137.862930	224.573105
49	☐	60D0021	90.096123	65.226318	137.862915	138.189865	60D0021	137.862930	222.998322
50	☐	60V0098	89.999359	65.340508	137.862915	138.244690	60V0098	137.862930	225.023163
51	☐	60V0039	89.999359	65.441666	137.862915	142.761261	60T0116	132.962875	225.068741
52	☐	60V0074	89.999359	65.460251	137.862915	138.196762	60V0074	137.862930	221.068771
53	☐	60V0095	89.999359	65.712608	137.862915	138.228439	60V0095	137.862930	224.542953
54	☐	60T0009	90.155464	65.714073	137.862915	138.229630	60T0009	137.862930	225.056778
55	☐	60V0073	89.999359	65.774429	137.862915	138.188950	60V0073	137.862930	221.068771
56	☐	60V0099	90.333435	65.968239	137.862915	138.214752	60V0099	137.862930	225.003632
57	☐	60T0010	90.225037	66.211174	137.862915	138.206848	60T0010	137.862930	224.460678
58	☐	60V0019	89.999359	66.439415	137.862915	138.191620	60V0019	137.862930	223.167313
59	☐	J10	90.013931	66.535591	137.862915	137.862686	J10	137.862930	224.878296
60	☐	60D0008	89.999359	66.974609	137.862915	142.887466	J10	132.859879	224.367737
61	☐	FUT14	90.001633	67.497391	137.862915	137.860962	FUT14	137.862930	225.128189
62	☐	60T0031	90.083626	67.719902	137.862915	138.144745	60V0074	137.862442	221.068726
63	☐	60V0047	90.117874	68.186638	137.862915	137.862900	60V0047	137.862930	225.185135
64	☐	60V0048	89.999359	68.536064	137.862915	137.861969	60V0048	137.862930	225.068771
65	☐	60V0097	89.999359	68.609306	137.862915	144.154495	60D0004	132.241318	224.268341
66	☐	60D0007	90.048615	68.688095	137.862915	138.068298	60D0007	137.862930	224.068787
67	☐	60T0068	90.168419	68.983368	137.862915	143.127396	60T0116	132.962738	225.068726
68	☐	60T0013	90.217529	69.045158	137.862915	146.968292	60D0004	129.523865	223.991013
69	☐	60T0065	89.999359	69.197830	137.862915	138.253510	60T0065	137.862930	225.088959
70	☐	FUT18	90.043243	69.508774	137.862915	144.103516	FUT14	132.079025	224.537964

28176 Jarvis - EXISTING - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
71	☐	FUT22	90.081543	69.889503	137.862915	138.245682	FUT22	137.862930	224.999573
72	☐	FUT30	90.042511	70.299637	137.862915	143.165894	60DEPO01	132.558624	222.834824
73	☐	60V0087	90.149391	71.061485	137.862915	138.090286	60V0087	137.862930	224.243301
74	☐	60T0050	89.999359	71.177017	137.862915	138.907181	60DEPO01	137.229691	223.311508
75	☐	60T0049	89.999359	71.177078	137.862915	139.400467	60DEPO01	136.742111	223.261749
76	☐	60V0005	89.999359	71.287941	137.862915	139.808167	60DEPO01	136.339798	223.220688
77	☐	60V0017	89.999359	71.336029	137.862915	157.839294	60D0016	118.128334	225.068420
78	☐	60T0017	90.164482	72.189079	137.862915	158.567276	60D0016	117.379524	224.992004
79	☐	FUT20	90.080421	72.287750	137.862915	141.831741	FUT22	134.203873	224.626160
80	☐	60V0041	89.999359	72.296898	137.862915	144.307220	60T0114	131.839951	225.454147
81	☐	FUT28	90.083679	72.311180	137.862915	147.866547	FUT14	128.267059	224.148941
82	☐	60V0016	89.999359	72.591759	137.862915	150.878418	60D0016	125.536552	225.824417
83	☐	60V0006	90.671356	72.615097	137.862915	139.264236	60DEPO01	136.832001	223.270920
84	☐	60V0037	90.089790	72.638847	137.862915	138.150055	60V0037	137.862930	225.068771
85	☐	60V0038	90.191330	72.823380	137.862915	138.142090	60V0038	137.862930	225.068771
86	☐	FUT92	89.999359	73.199593	137.862915	138.147003	FUT92	137.862930	224.568787
87	☐	60T0118	90.150459	73.206413	137.862915	144.998688	60T0114	131.126953	225.381378
88	☐	60V0040	89.999359	73.427589	137.862915	143.850769	60T0114	132.278305	225.498871
89	☐	60T0063	90.074867	73.516777	137.862915	138.127075	60T0063	137.862930	225.068771
90	☐	60T0087	90.029846	73.548195	137.862915	137.974182	60T0087	137.862930	222.292450
91	☐	60T0044	90.858246	74.008110	137.862915	148.817978	60T0060	127.114243	222.974899
92	☐	60V0020	89.999359	74.012444	137.862915	138.030640	60V0020	137.862930	224.106903
93	☐	60T0038	90.136047	74.036842	137.862915	151.001297	60D0009	124.899994	222.317276
94	☐	60T0014	90.126556	75.331963	137.862915	138.005585	60T0014	137.862930	224.111588
95	☐	60T0069	90.036224	76.095139	137.862915	138.542419	60T0114	137.394363	226.020966
96	☐	60V0071	89.999359	76.889626	137.862915	137.974701	60V0071	137.862930	221.068771
97	☐	60V0102	89.999359	77.044418	137.862915	137.971008	60V0102	137.862930	221.019455
98	☐	60V0070	89.999359	77.094986	137.862915	137.971451	60V0070	137.862930	221.068771
99	☐	60T0029	90.131538	77.104851	137.862915	137.977951	60V0074	137.856903	221.068161
100	☐	60T0027	89.999359	77.126999	137.862915	137.970627	60T0027	137.862930	221.053787
101	☐	60V0056	89.999359	77.275917	137.862915	156.358795	60DEPO01	119.865150	221.539459
102	☐	60V0036	90.145325	77.309952	137.862915	138.008118	60V0036	137.862930	223.473358
103	☐	60T0047	90.148582	77.384270	137.862915	157.014389	60DEPO01	119.162964	221.467804
104	☐	60T0015	89.999359	77.575905	137.862915	137.963608	60T0015	137.862930	223.326218
105	☐	60V0014	89.999359	77.857002	137.862915	172.095200	60D0016	104.026726	223.629364

28176 Jarvis - EXISTING - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
106	☐	60T0045	89.999359	77.975967	137.862915	147.335052	60DEPO01	129.042831	222.476044
107	☐	60V0107	89.999359	78.398087	137.862915	137.948669	60V0107	137.862930	222.568787
108	☐	60T0021	90.088715	78.623779	137.862915	137.946106	60T0021	137.862930	222.568787
109	☐	60V0018	89.999359	79.074844	137.862915	151.133774	60D0016	126.243835	225.896591
110	☐	60V0105	89.999359	79.296806	137.862915	157.755646	60D0016	119.968712	225.256226
111	☐	60T0016	90.080597	79.349365	137.862915	164.782410	60D0016	113.009758	224.546066
112	☐	60V0106	89.999359	79.370346	137.862915	155.028290	60D0016	122.712990	225.536285
113	☐	60V0015	89.999359	79.798691	137.862915	171.516052	60D0016	104.892250	223.717697
114	☐	60V0013-B	90.000053	79.876015	137.862915	175.300430	60D0016	100.512123	223.270706
115	☐	60V0012	89.999359	80.088295	137.862915	173.602112	60D0016	102.631508	223.486969
116	☐	60V0013	90.248230	80.326447	137.862915	175.040802	60D0016	100.858086	223.306000
117	☐	60V0011	89.999359	81.128075	137.862915	156.215729	60D0016	120.859314	225.347107
118	☐	60T0023	90.109962	81.414230	137.862915	162.079056	60D0016	114.766258	224.725311
119	☐	60V0034	90.083656	82.696289	137.862915	137.898315	60V0034	137.862930	222.947495
120	☐	60V0076	89.999359	82.735298	137.862915	137.888977	60V0076	137.862930	223.416489
121	☐	60T0090	90.120712	82.901718	137.862915	137.889114	60T0090	137.862930	223.541656
122	☐	60V0081	89.999359	83.090454	137.862915	137.889923	60V0081	137.862930	224.108246
123	☐	60V0093	89.999359	83.258987	137.862915	163.554535	60D0016	114.324364	224.680222
124	☐	60V0069	89.999359	83.702316	137.862915	151.240387	60D0016	126.379509	225.910431
125	☐	60T0024	90.196899	83.769707	137.862915	166.813156	60D0016	111.455444	224.387466
126	☐	60V0009	89.999359	84.177994	137.862915	171.655502	60D0016	107.359077	223.969421
127	☐	60V0091	89.999359	84.205284	137.862915	162.247467	60T0094	113.496521	223.886688
128	☐	60V0077	90.089363	84.269310	137.862915	137.878326	60V0077	137.862930	221.885193
129	☐	60V0051	89.999359	84.385567	137.862915	162.150772	60D0016	117.036919	224.957047
130	☐	60T0026	89.999359	84.492996	137.862915	174.047302	60D0016	105.389877	223.768463
131	☐	60T0025	90.172752	84.580292	137.862915	175.297348	60D0016	104.058800	223.632645
132	☐	60V0010	89.999359	84.790352	137.862915	168.877609	60D0016	110.759651	224.316452
133	☐	60T0085	90.132538	85.077133	137.862915	139.317245	60V0081	136.423615	223.961365
134	☐	60V0104	89.999359	85.210938	137.862915	137.874100	60V0104	137.862930	222.068771
135	☐	60T0088	90.082909	85.285202	137.862915	140.065979	60T0087	135.671188	222.068771
136	☐	60V0082	89.999359	85.478012	137.862915	137.874603	60V0082	137.862930	223.936478
137	☐	60V0033	89.999359	85.687561	137.862915	143.425446	60T0114	132.649536	225.536774
138	☐	60V0032	89.999359	85.956451	137.862915	138.190399	60T0087	137.546249	222.260132
139	☐	60V0021	89.999359	86.265472	137.862915	177.272049	60D0016	99.258827	223.142807
140	☐	60V0035	89.999359	86.619987	137.862915	150.129913	60D0009	125.969437	222.426407

28176 Jarvis - EXISTING - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
141	☐	60V0022	89.999359	86.781616	137.862915	175.948807	60D0016	100.886215	223.308884
142	☐	60T0080	90.087669	86.831413	137.862915	149.314758	60T0114	127.263489	224.987122
143	☐	60V0023	89.999359	86.851044	137.862915	161.167068	60D0016	116.699432	224.922607
144	☐	60T0077	90.242722	86.876038	137.862915	144.524704	60T0114	131.583160	225.427933
145	☐	60V0080	89.999359	86.962204	137.862915	155.566818	60D0016	122.943771	225.559830
146	☐	60T0036	90.331573	87.014175	137.862915	178.923096	60D0016	97.600250	222.973557
147	☐	60V0078	89.999359	87.098511	137.862915	139.158066	60D0016	136.864090	226.980377
148	☐	60T0091	90.100121	87.116386	137.862915	163.324219	60T0094	112.406776	223.775482
149	☐	60V0079	89.999359	87.189224	137.862915	153.691330	60D0016	124.701859	225.739243
150	☐	60V0092	89.999359	87.230988	137.862915	157.780930	60T0094	118.405769	224.387665
151	☐	60T0039	90.117874	87.335846	137.862915	157.672577	60D0016	120.908249	225.352112
152	☐	60V0089	89.999359	87.348495	137.862915	160.104446	60T0094	116.082741	224.150604
153	☐	60T0040	89.999359	87.392815	137.862915	154.760727	60D0016	123.517960	225.618423
154	☐	60V0090	89.999359	87.555656	137.862915	161.750107	60T0094	114.189186	223.957367
155	☐	60V0049	90.117065	89.817474	137.862915	146.372879	60T0094	130.287430	225.600189
156	☐	60T0112	89.999359	90.359001	137.862915	152.455383	60T0094	125.411774	225.102615
157	☐	60V0024	89.999359	91.868851	137.862915	177.769226	60D0016	101.296318	223.350723
158	☐	60V0085	89.999359	92.079491	137.862915	166.395050	60T0094	111.687340	223.702057
159	☐	60V0086	89.999359	92.155487	137.862915	164.345474	60T0094	113.735664	223.911102
160	☐	60V0025	89.999359	92.221085	137.862915	179.126389	60D0016	99.710754	223.188934
161	☐	60T0081	90.261124	92.292343	137.862915	180.832352	60D0016	97.946083	223.008850
162	☐	60V0084	89.999359	92.388405	137.862915	168.185120	60D0016	111.556656	224.397781
163	☐	60V0031	89.999359	92.422348	137.862915	164.823288	60D0016	114.692635	224.717804
164	☐	60T0083	90.142807	92.503937	137.862915	168.789230	60T0094	109.220253	223.450287
165	☐	60V0027	89.999359	95.480591	137.862915	152.054276	60T0094	123.993423	224.957886
166	☐	60V0026	89.999359	96.217209	137.862915	153.288696	60D0016	123.555466	225.622253
167	☐	60T0096	90.321144	96.892761	137.862915	154.487228	60D0016	122.329163	225.497101
168	☐	60V0103	89.999359	99.545090	137.862915	153.043701	60D0016	123.827141	225.649963
169	☐	60V0029	90.275513	103.613586	137.862915	137.874252	60V0029	137.862946	226.860779
170	☐	60V0030	90.035599	116.804520	137.862915	137.891205	60V0030	137.862961	228.568787
171	☐	60V0028	89.999359	160.887909	137.862915	137.866806	60V0028	137.863007	225.162598
172	☐	60T0098	90.226692	180.583542	137.862915	137.868332	60T0098	137.863022	225.258789
173	☐	85CHAM01	89.999359	181.247513	137.862915	137.867035	85CHAM01	137.863022	225.123474
174	☐	60T0113	89.999359	188.272202	137.862915	153.928879	60D0016	122.420570	225.506439
175	☐	60V0008	89.999359	191.284348	137.862915	137.864258	60V0008	137.863052	229.568802

28176 Jarvis - EXISTING - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
176	☐	60T0097	89.999359	194.865662	137.862915	168.206848	60D0016	107.547371	223.988632
177	☐	60T0104	89.999359	216.249680	137.862915	137.864792	60T0104	137.863083	229.634109
178	☐	60V0060	89.999359	218.368637	137.862915	137.865067	60V0060	137.863083	229.714645
179	☐	60V0068	89.999359	226.358093	137.862915	137.866882	60V0068	137.863098	229.068787
180	☐	60T0101	90.016136	227.373505	137.862915	137.867340	60T0101	137.863113	229.568802
181	☐	60V0007	89.999359	234.366257	137.862915	168.510864	60D0016	107.281952	223.961548
182	☐	60V0067	89.999359	242.602570	137.862915	137.870499	60V0067	137.863129	229.568802
183	☐	65WBS01	124.499115	266.357208	137.862915	137.863647	65WBS01	137.863113	223.068802
184	☐	60V0050	89.999359	270.988586	137.862915	137.872620	60V0050	137.863190	230.553284
185	☐	60T0102	89.999359	273.001953	137.862915	137.882675	60T0102	137.863190	229.568802
186	☐	60V0030-B	89.999359	281.780121	137.862915	137.883713	60V0030-B	137.863205	231.568802
187	☐	60V0108	89.999359	288.145416	137.862915	141.055176	60V0050	134.692017	230.229645
188	☐	60V0108-B	89.999359	294.122864	137.862915	143.375565	60V0030-B	132.368561	231.008072

Appendix B

Wastewater Model Parameters

Appendix B – PCSWMM Model Parameters

The following sets out a description of each of the parameters used in the steady state wastewater conveyance system modelling for the Jarvis Master Plan. Any differences from the below at any of the specific elements are noted in the description in the model. The PCSWMM model has been based on the previous H2OMAP modelling completed for the 2010 Master Plan.

A1.0 Link Elements

A1.1 Conduits

Conduits represent sanitary sewers.

Parameter	Units	Description / Values
Name	-	Conduits taken from the 2010 Master Plan maintain the same name which appears to be linked to one of the connecting nodes. New conduits are named based on the supplied GIS data.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.
Tag	-	No tags were used in the model.
Length	m	Length is auto-calculated in PCSWMM and is consistent with the 2010 Master Plan except for new links.
Roughness	-	For links from the 2010 Master Plan the roughness coefficient is maintained. For new sections a roughness coefficient of 0.013 is used.
Inlet Offset	m	Inlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Outlet Offset	m	Outlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Initial Flow	m^3/s	No initial flows are set in the model
Flow Limit	m^3/s	No flow limits are set in the model
Entry Loss Coeff.	-	No losses are used in a steady state conveyance model.

Parameter	Units	Description / Values
Exit Loss Coeff.	-	No losses are used in a steady state conveyance model.
Ave. Loss Coeff.	-	No losses are used in a steady state conveyance model.
Seepage Rate	mm/hr	There is no seepage applied to conduits in this model.
Flap Gate	-	No flapgates are used in the model.
Cross Section	-	Cross sections are generally circular for sewers, rectangular for streets, trapezoidal for open channel flow and either circular, elliptical or rectangular for cuvlerts. Cross sections are consistent with the 2010 Master Plan.
Geom1	m	**Type** / **Description** Circular / Pipe diameter Ellipse / Maximum Depth or Standard Size ID
Geom2	m	**Type** / **Description** Circular / Not used Ellipse / Maximum Width or not used
Barrels	-	The number of identical sewers within the conduit, usually 1.
Transect	-	Refers to transect data, if used, for the open channel links.
Shape Curve	-	Not used in this model.
Culvert Code	-	Not used in this model.

A2.0 Node elements

A2.1 Storage

Storage nodes are used to represent manholes in the system.

Parameter	Units	Description / Values
Name	-	Naming is as per 2010 Master Plan.
Tag	-	No tags were used.

Parameter	Units	Description / Values
Inflows	-	Sanitary sewer flows are included as inflows as per Section A2.3.
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevations are taken from the 2010 Master Plan except new nodes where it is based on GIS data.
Rim Elevation	m	Elevation at the lid of the node taken from the 2010 Master Plan except new nodes where it is based on GIS data..
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are used if there is backwater in the system at the start of the simulation. It is not used here.
Ponded Area	m^2	No ponded areas are set in the model.
Evaporation Factor	fraction	No evaporation is considered in design event analysis.
Storage Curve	-	Manholes have an assumed storage of 1.13 m^2 representing a 1200 mm diameter manhole.

A2.2 Outfalls

A single outfall is present in the model at the pump station location. Since only a steady state analysis is being carried out the downstream boundary condition does not impact results.

Parameter	Units	Description / Values
Name	-	Outfalls are named as per the 2010 Master Plan.
Tag	-	No tags were used for the outfalls.
Inflows	-	No external inflows are applied at outfall nodes
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevation of the node is as per the 2010 Master Plan.

Parameter	Units	Description / Values
Rim Elevation	m	Elevation at the lid of the node as per the 2010 Master Plan.
Tide Gate	-	No backflow is prevented in the model outfalls and therefore 'No' is selected.
Route To	-	If flow from the outfall is directed to another subcatchment but this is not done in the model and this parameter is left blank.
Type	-	All outfalls have NORMAL outfall type which means depth of flow at the outlet is not affected by downstream conditions.

A2.3 Inflows

Parameter	Units	Description / Values
Baseline	m^3/s	For direct flow into a drainage system, not used in the model.
Baseline Pattern	-	For direct flow into a drainage system, not used in the model.
Timeseries	-	For direct flow into a drainage system, not used in the model.
Scale Factor	-	For direct flow into a drainage system, not used in the model.
Average Value	m^3/s	The average value represents the DWF into the system at the node. It consists of the base flow multiplied by the peaking factor and the infiltration component.
Time Patterns	-	Where no time patterns are applied to the average value the time value is 1.0.
Hydrograph	-	Used for wet weather flows and not included in the model.
Sewershed Area	ha	The sewershed areas contributing to the node.

Appendix C

Stormwater Model Parameters

Appendix A – PCSWMM Model Parameters

The following sets out a description of each of the parameters used in the dual drainage modelling for the Jarvis Master Plan. Any differences from the below at any of the specific elements are noted in the description in the model. The PCSWMM model has been based on the previous Infoworks CS modelling completed for the 2010 Master Plan.

A1.0 Subcatchments

Parameter	Units	Description
Name	-	The name of the subcatchment as per the 2010 Master Plan and is based on the receiving node ID. New areas have a name based on the downstream receiving node ID.
Tag	-	The catchments are tagged by one of the land use covers identified in the 2010 Master Plan. The catchments representing the most recent development occurred in 2010 were tagged as 'Recent_Development'. The catchments representing the future development that will occur by 2020 were tagged as 'Future_Development'.
Rain Gauge	-	The storm type selected for the model run. The following IDF parameters, as per the 2010 Master Plan, were used to create the 3-hour Chicago design storms: **Return Period** / **a** / **b** / **c** / **Depth (mm)** 1:2 year / 646.0 / 6.0 / 0.781 / 32.6 1:5 year / 1,049.5 / 8.0 / 0.803 / 47.0 1:100 year / 2,317.4 / 11.0 / 0.836 / 86.1
Outlet	-	The subcatchment runoff receiving node which is the same location as per the 2010 Master Plan. New areas have been allocated to the lowest elevation major system node in the catchment.
Area	ha	The area is calculated internally by PCSWMM through GIS and is the same as the 2010 Master Plan value used.

Parameter	Units	Description
Width / Flow Length	m	The width parameter has been taken from the 2010 Master Plan where the catchment has remained unchanged from 2010. For the regular shaped new subcatchments the width parameter has been calculated as the length perpendicular to overland flow direction within subcatchment. The width parameter of any new irregular shaped subcatchment are calculated to take in the account for skew within the subcatchment using the approach proposed by Guo and Urbonas (2007) (refer to EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016)).
Slope	%	Slopes are from the 2010 Master Plan except where noted in the comments. Some subcatchments had 0 slope in 2010 and a shallow slope of 0.2 has been used in the PCSWMM model to obtain similar peak flows as 2010. Three of the large agricultural subcatchments, noted in the model descriptions, have had slopes altered to provide similar flows to the 2010 model.
Imperv	%	For subcatchments from the 2010 Master Plan the Imperv is the directly and indirectly connected imperviousness used in the model. For new areas this value has been calculated based on impervious land cover. **Land Cover** — **IMP %** Agricultural — 8 EXTERNAL W/ SOME URBAN — 13 ICI - Heavy Clay — 94 Mixed LD RES with Commercial. — 40 Open Spaces — 8 Residential - LD Cul-Sac — 67 Residential - LD Heavy Clay — 70 School — 64
N Imperv	-	A constant of 0.013 is selected as the Manning's N for impervious surfaces such as roads, sidewalk and parking areas. The value is representative of smooth impervious surface as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).
N Perv	-	A constant of 0.25 is used as the Manning's N for pervious areas. The value is representative of light to tense turf land cover as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).

Parameter	Units	Description
DStore Imperv	mm	A standard value of 1.57 mm is used as the impervious depression storage.
DStore Perv	mm	The pervious depression storage is linked to the Curve Number (CN) and Soil Storage (S) using the following relationship: **CN** — **DStore Perv** ≤ 70 — 0.075*S > 70 ≤ 80 — 0.10*S > 80 ≤ 90 — 0.155*S > 90 — 0.2*S Note: $S = \frac{25400}{CN} - 254$
Zero Imperv	%	Across areas of water it is considered that there is no depression storage. This value has been set to 0.
Subarea Routing	-	For subcatchments in the 2010 Master Plan the subrouting is either to PERVIOUS or IMPERVIOUS in accordance with the pervious model. The value is the receiving subarea of flow from other subareas in the catchment. For new subcatchments the constant 'PERVIOUS' is entered to simulate the subarea of impervious surface which may flow over pervious areas prior to discharging to the outlet of the subcatchment.
Percent Routed	%	The percent of routed subarea is taken from the 2010 Master Plan for each catchment. For new subcatchments this is estimated based on direction of runoff from impervious areas in the new development areas. **Land Cover** — **%IMP to PERVIOUS** — **% PERV. to IMP** Agricultural — 62.5 — 0 EXTERNAL W/ SOME URBAN — 0 — 17.2 ICI - Heavy Clay — 0 — 100 Mixed LD RES with Commercial. — 15 — 0 Open Spaces — 75 — 0 Residential - LD Cul-Sac — 15 — 0 Residential - LD Heavy Clay — 6 — 0 School — 0 — 100

Parameter	Units	Description
CN Value	-	The following CN values have been used based on the soil type from the OMAFRA mapping and the land cover. The OMAFRA mapping indicated that soils of hydrologic soil group C and D are prevalent in the area. In the urban areas a soil class D was assumed. **Land Cover** / **C CN Value** / **D CN Value** Agricultural: 79 / 84 EXTERNAL W/ SOME URBAN: 79 / 84 ICI - Heavy Clay: 76 / 81 Mixed LD RES with Commercial.: 71 / 78 Open Spaces: 71 / 78 Residential - LD Cul-Sac: 71 / 78 Residential - LD Heavy Clay: 71 / 78 School: 71 / 78 The CN value was area weighted based on the percentage of soil class in the subcatchment. A modified CN value (CN*) was calculated for each subcatchment to account for the difference in initial abstraction from the standard value of 0.2S.
Drying Time	days	The time for a fully saturated soil to completely dry is set at 7 days though this is not used in design event analysis.

The parameters Curb Length, Snow Pack, LID Controls, Groundwater and Erosion are not used in the model.

A2.0 Link Elements

A2.1 Conduits

Conduits represent either open channels or culverts.

Parameter	Units	Description / Values
Name	-	Conduits taken from the 2010 Master Plan maintain the same name which appears to be linked to one of the connecting nodes. New conduits are named based on the supplied GIS data.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.

Parameter	Units	Description / Values
Tag	-	Conduits are tagged as follows which is consistent with the type in the 2010 Master Plan model: **Tag** — **Description** Storm_Sewer — Underground piped infrastructure FUT_Storm_Sewer — Underground piped infrastructure of future development Street — Flow through streets Culvert — Piped flow with open channel flow either side SWMF_Outlet — Outlet Pipe from Stormwater Management Facility (SWMF) Overland — Open channel flow
Length	m	Length is auto-calculated in PCSWMM and is consistent with the 2010 Master Plan except for new links.
Roughness	-	For links from the 2010 Master Plan the roughness coefficient is maintained. For new sections the roughness coefficient of 0.013 is used for all sewer and culverts links. For channels the roughness coefficient of 0.035 is used for the channel.
Inlet Offset	m	Inlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Outlet Offset	m	Outlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Initial Flow	m^3/s	No initial flows are set in the model
Flow Limit	m^3/s	No flow limits are set in the model
Entry Loss Coeff.	-	Culvert entry losses are dependent on the type of inlet used and are consistent with the 2010 Master Plan.

Parameter	Units	Description / Values
Exit Loss Coeff.	-	Exit loss coefficients are applied to culverts to simulate the losses to open channel flow and are consistent with the losses applied in the 2010 Master Plan. Sewer losses are dependent on the change in direction of flow **Angle (deg) — Loss Coef.** 0 — 0.02 10 — 0.045 20 — 0.118 30 — 0.21 40 — 0.325 50 — 0.46 60 — 0.635 70 — 0.84 80 — 1.065 90 — 1.32 No losses are applied to overland or street flow.
Ave. Loss Coeff.	-	The average loss coefficient is not used in this model.
Seepage Rate	mm/hr	There is no seepage applied to conduits in this model.
Flap Gate	-	No flapgates are used in the model.
Cross Section	-	Cross sections are generally circular for sewers, rectangular for streets, trapezoidal for open channel flow and either circular, elliptical or rectangular for cuvlerts. Cross sections are consistent with the 2010 Master Plan.
Geom1	m	**Type — Description** Circular — Pipe diameter Rectangular — Maximum Depth Trapezoidal — Maximum Depth Ellipse — Maximum Depth or Standard Size ID
Geom2	m	**Type — Description** Circular — Not used Rectangular — Bottom Width Trapezoidal — Bottom Width Ellipse — Maximum Width or not used

Parameter	Units	Description / Values
Geom3	m/m	**Type** / **Description** Circular / Not used Rectangular / Not used Trapezoidal / Left slope Ellipse / Not used
Geom4	m/m	**Type** / **Description** Circular / Not used Rectangular / Not used Trapezoidal / Right slope Ellipse / Not used
Barrels	-	The number of identical sewers within the conduit, usually 1.
Transect	-	Refers to transect data, if used, for the open channel links.
Shape Curve	-	Not used in this model
Culvert Code	-	The culvert code is used for culvert inlet links to ensure that the model treats the link as a culvert opening. Culvert codes have been selected to maintain consistency with the culvert coefficients used in the 2010 Master Plan.

A2.2 Weirs

Weirs have been used to carry overland flow through urban flow routes and across roads where culverts are overtopped. They are consistent in location with the 2010 Master Plan.

Parameter	Units	Description / Values
Name	-	Weirs maintain the same name as per the 2010 Master Plan which appears to be linked to one of the connecting nodes.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.
Tag	-	No tags used.
Type	-	All weirs links are transverse weirs where a rectangular cross section is perpendicular to the direction of flow.

Parameter	Units	Description / Values
Height	m	Maximum height of weir flow, consistent with Rim Elevation of the Inlet Node.
Length	m	Opening width of the weir.
Side Slope	m/m	Not used for rectangular transverse weirs
Inlet Elevation	m	Elevation of the crest of the weir.
Discharge Coefficient	-	Standard value of 0.85 in SI units used to represent a broad crested weir structure.
Flap Gate	-	No flap gates are applied.
End Contractions	-	Not used as consistent with the 2010 Master Plan.
End Coefficient	m^3/s	Not used as consistent with the 2010 Master Plan.
Can surcharge	-	Weirs have not been allowed to surcharge in order to represent free flow conditions in open channel flow.

A2.3 Outlets

These have been added in the model from the 2010 Master Plan. In Infoworks CS the major and minor system can be connected at the same node. In SWMM models the major and minor system must have separate nodes and be connected via an outlet link which represents catchbasin or multiple catchbasin inflows. The flows into the minor system are therefore under greater control in the updated SWMM model and may affect the behaviour of the system.

Parameter	Units	Description / Values
Name	-	Naming is based on the inlet node.
Inlet Node	-	Inlet node of the outlet link (the major system).
Outlet Node	-	Receiving node of the outlet link (minor system).
Tag	-	No tags used.
Inlet Elevation	m	The inlet elevation is set as the invert of the major system node.

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Flap Gate</td><td>-</td><td>No flapgate restrictions are set so that backflow from the minor system into the major is allowed.</td></tr>
<tr><td>Rating Curve</td><td>-</td><td>All rating curves are set as TABULAR/HEAD in order that the minor system HGL affects the inlet capacity of the system. The curves are created using the inlet rating curve of a standard catchbasin grate and/or 600mm x 600mm ditch inlet grate. The curve data contains the number of catchbasins and ditch inlets lumped in each rating curve.
<table>
<tr><th>Head above grate (m)</th><th>Catchbasin Inlet Capacity (m³/s)</th><th>Ditch Inlet Capacity (m³/s)</th></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0.01</td><td>0.002</td><td>0.012</td></tr>
<tr><td>0.015</td><td>0.002</td><td>0.013</td></tr>
<tr><td>0.021</td><td>0.003</td><td>0.016</td></tr>
<tr><td>0.03</td><td>0.005</td><td>0.018</td></tr>
<tr><td>0.04</td><td>0.006</td><td>0.023</td></tr>
<tr><td>0.05</td><td>0.008</td><td>0.027</td></tr>
<tr><td>0.054</td><td>0.010</td><td>0.028</td></tr>
<tr><td>0.06</td><td>0.013</td><td>0.03</td></tr>
<tr><td>0.08</td><td>0.022</td><td>0.04</td></tr>
<tr><td>0.09</td><td>0.034</td><td>0.045</td></tr>
<tr><td>0.1</td><td>0.048</td><td>0.053</td></tr>
<tr><td>0.104</td><td>0.052</td><td>0.054</td></tr>
<tr><td>0.11</td><td>0.06</td><td>0.06</td></tr>
<tr><td>0.14</td><td>0.08</td><td>0.081</td></tr>
<tr><td>0.15</td><td>0.085</td><td>0.09</td></tr>
<tr><td>0.16</td><td>0.09</td><td>0.099</td></tr>
<tr><td>0.17</td><td>0.095</td><td>0.105</td></tr>
<tr><td>0.2</td><td>0.097</td><td>0.12</td></tr>
<tr><td>0.3</td><td>0.1</td><td>0.237</td></tr>
<tr><td>1</td><td>0.1</td><td>0.9</td></tr>
</table>
Rating curve for 1200mm x 600mm ditch inlet representing the outlet structure at JM_Pond_2 was obtained for as-built information (DWG: 0674-SWM2 - Phase 2 Development-Upper Canada Consultants) and Chart 4.20 ‘Ditch Inlet Capacity’ from MTO Drainage Manual:
<table>
<tr><th>Head above grate (m)</th><th>Ditch Inlet Capacity (m³/s)</th></tr>
<tr><td>0</td><td>0.0000</td></tr>
<tr><td>0.02</td><td>0.0216</td></tr>
<tr><td>0.06</td><td>0.0540</td></tr>
</table></td></tr>
</table>

Parameter	Units	Description / Values
		0.1 0.1080 0.2 0.3360 0.3 0.7200 0.4 1.3200 0.5 2.0400
Curve Name	-	The name of the lumped curve used for the outlet link.

A3.0 Node elements

A3.1 Junctions

Junctions are used to connect the links and have no hydraulic properties associated with them.

Parameter	Units	Description / Values
Name	-	Naming as per 2010 Master Plan or standard naming convention for new nodes.
Tag	-	No tags used for junction nodes.
Inflows	-	No additional inflows to the system are modelled.
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevation of the node taken from 2010 Master Plan. For new nodes the invert elevation is based on grading for major system nodes.
Rim Elevation	m	Elevation at the top of the node based on the depth of the connecting links, generally taken from the 2010 Master Plan or updated for connectivity. New nodes it is set on the depth of the adjoining conduits.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are used if there is backwater in the system at the start of the simulation. It is not used in this model as there is no downstream backwater control.
Surcharge Depth	m	No surcharge depth is applied.

Parameter	Units	Description / Values
Ponded Area	m²	No ponded areas are set in the model.

A3.2 Storage

Storage nodes are used to represent manholes in the system, sag storage in the surface along street sections or natural/man-made storage facilities.

Parameter	Units	Description / Values
Name	-	Naming is as per 2010 Master Plan except the major and minor nodes have been separated so the minor system storage nodes have an STM- prefix.
Tag	-	Minor system manholes are tagged.
Inflows	-	No additional inflows to the system are modelled.
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevations are taken from the 2010 Master Plan except new nodes where it is based on GIS data or surface topography.
Rim Elevation	m	Elevation at the top of the node based on the depth of the connecting links. Taken from the 2010 Master Plan but updated at some locations to maintain connectivity.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are used if there is backwater in the system at the start of the simulation. It is not used here.
Ponded Area	m²	No ponded areas are set in the model.
Evaporation Factor	fraction	No evaporation is considered in design event analysis.

Parameter	Units	Description / Values
Storage Curve	-	For sag storage and manholes a FUNCTIONAL storage curve is selected where the constant value is the footprint of the storage. Manholes have an assumed storage of 1.13 m² representing a 1200 mm diameter manhole. Sag storage has a constant of 10m² as per the 2010 Master Plan. New areas use similar values. For natural or man-made storage facilities such as SWM facilities the storage curve is TABULAR and the curve is based on the area – depth relationship of the facility.

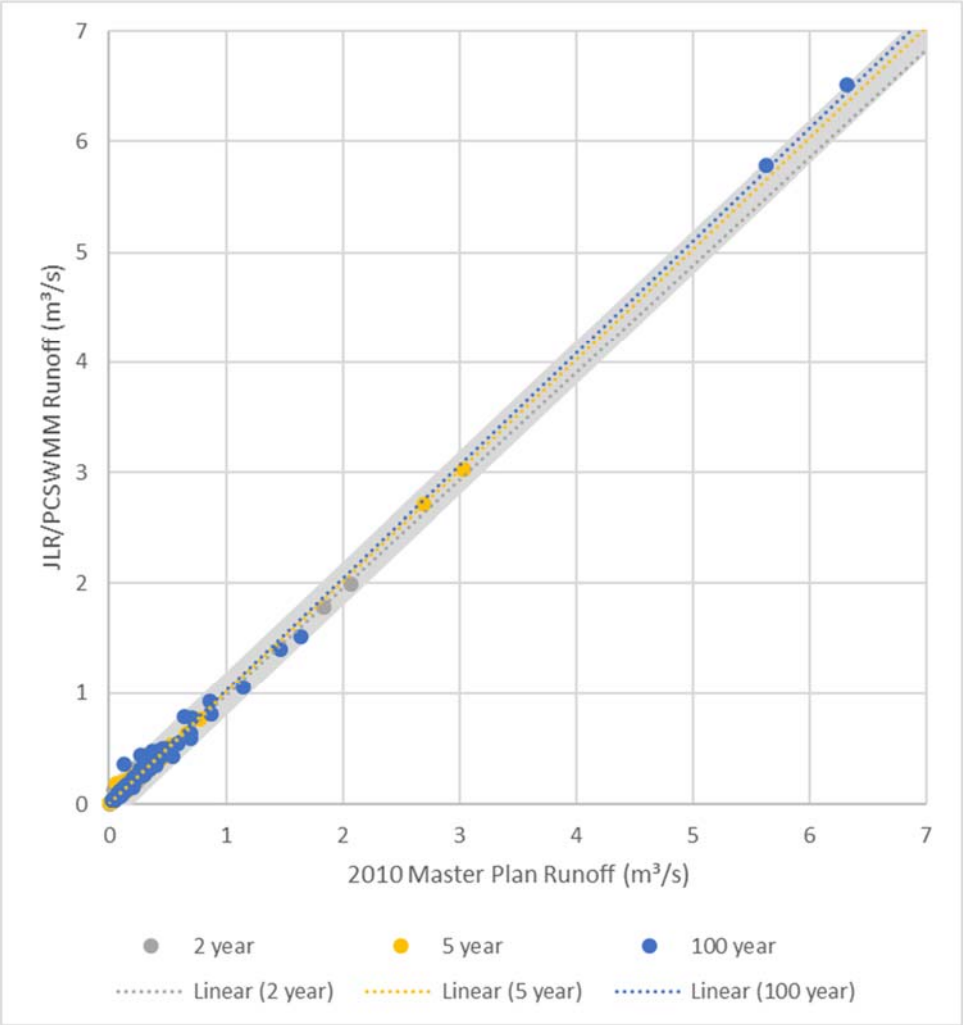
A3.3 Outfalls

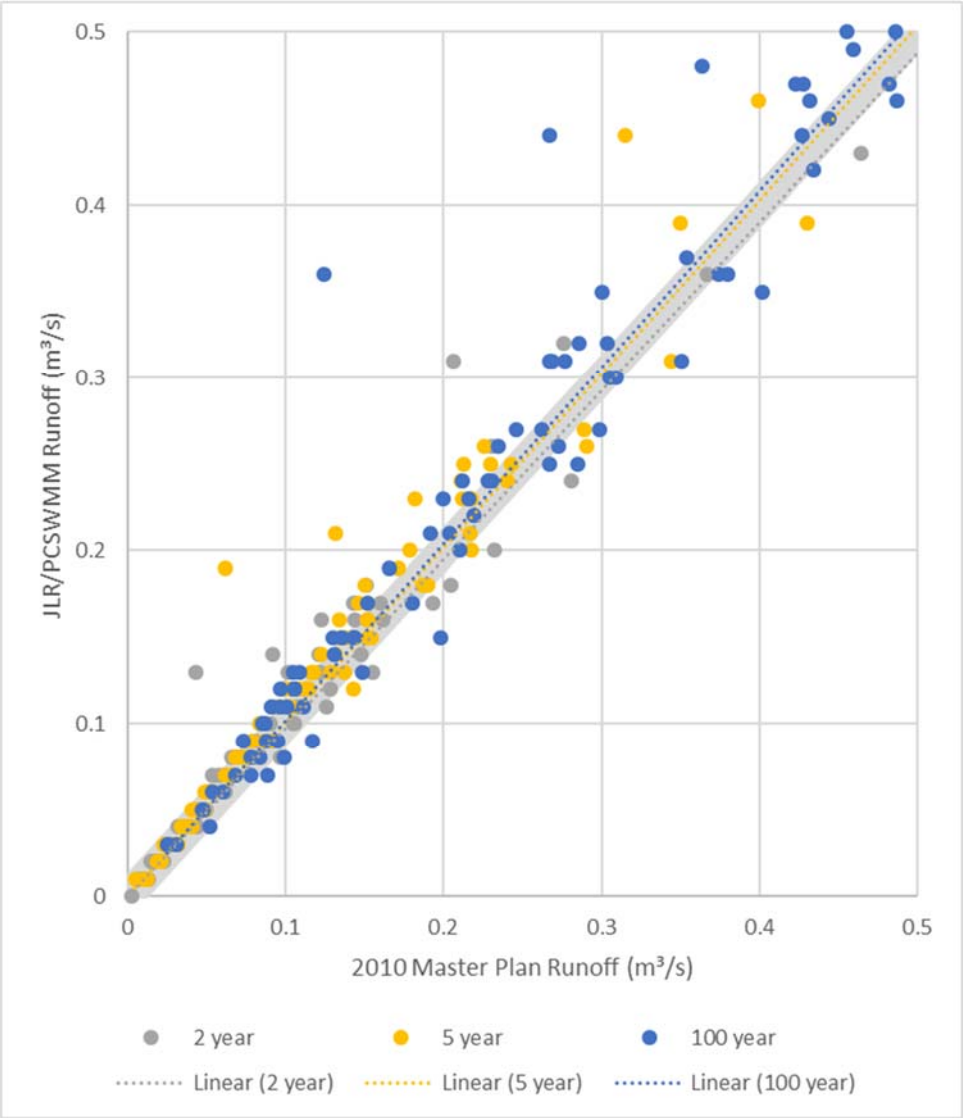
Parameter	Units	Description / Values
Name	-	Outfalls are named as per the 2010 Master Plan.
Tag	-	No tags were used for the outfalls.
Inflows	-	No external inflows are applied at outfall nodes
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevation of the node is as per the 2010 Master Plan.
Rim Elevation	m	Elevation at the top of the node based on the depth of the connecting links.
Tide Gate	-	No backflow is prevented in the model outfalls and therefore 'No' is selected.
Route To	-	If flow from the outfall is directed to another subcatchment but this is not done in the model and this parameter is left blank.
Type	-	All outfalls have NORMAL outfall type which means depth of flow at the outlet is not affected by downstream conditions.

A4.0 Model Comparison

The results of the PCSWMM model can be compared to the 2010 Master Plan results for each subcatchment to confirm the appropriateness of the PCSWMM simulation. The graph in the figure below shows the runoff for each subcatchment in the 2010 Master Plan against the runoff

in the PCSWMM model. The majority of the subcatchments have runoff values similar (within the grey line) to the previous model. The graph confirms that the PCSWMM model represents the runoff within the study area to a similar degree as the 2010 Master Plan.




0.5
0.4
0.3
0.2
0.1
0
JLR/PCSWMM Runoff (m³/s)
0
0.1
0.2
0.3
0.4
0.5
2010 Master Plan Runoff (m³/s)
2 year
5 year
100 year
Linear (2 year)
Linear (5 year)
Linear (100 year)

Existing Condition Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60CBMH0018	60CBMH0018_OUT	0.86	70	52.4	0.0002	Residential - LD Heavy Clay	0.09	0.13	0.26
60CBMH0026	60CBMH0026_OUT	0.83	70	51.3	0.0006	Residential - LD Heavy Clay	0.1	0.14	0.27
60CBMH0037	60CBMH0037_OUT	2.48	70	88.8	0.0007	Residential - LD Heavy Clay	0.26	0.39	0.78
60CBMH0069	60CBMH0069_OUT	0.07	70	14.9	0.0027	Residential - LD Heavy Clay	0.01	0.01	0.03
60CBMH0070	60CBMH0070_OUT	1.03	70	83.85	0.0007	Residential - LD Heavy Clay	0.13	0.19	0.36
60CBMH0072	60CBMH0072_OUT	0.2	70	25	0.0027	Residential - LD Heavy Clay	0.03	0.04	0.07
60CBMH0074	60CBMH0074_OUT	0.41	70	36.1	0.0022	Residential - LD Heavy Clay	0.05	0.08	0.15
60CBMH0075	60CBMH0075_OUT	0.23	70	26.9	0.0004	Residential - LD Heavy Clay	0.03	0.04	0.08
60CBMH0077	60CBMH0077_OUT	0.36	67	33.6	0.0024	Residential - LD Cul-Sac	0.04	0.06	0.13
60CBMH0079	60CBMH0079_OUT	0.07	70	14.8	0.0052	Residential - LD Heavy Clay	0.01	0.01	0.03
60CBMH0082	60CBMH0082_OUT	0.62	70	44.4	0.0026	Residential - LD Heavy Clay	0.08	0.12	0.23
60CBMH0082.1	60STCB0082_OUT	0.74	70	48.4	0.0008	Residential - LD Heavy Clay	0.09	0.13	0.26
60CBMH0142	60CBMH0142_OUT	1.06	94	58.1	0.0005	ICI - Heavy Clay	0.16	0.23	0.46
60CBMH2000	60CBMH2000_OUT	1.5	70	59.083	0.0007	Residential - LD Heavy Clay	0.16	0.24	0.47
60CULV2002.4	60CULV2002d	0.14	70	20.8	0.0015	Residential - LD Heavy Clay	0.02	0.03	0.05
60CULV2013.1	60STOF2008	0.71	70	47.6	0.0005	Residential - LD Heavy Clay	0.08	0.12	0.24
60DICB0080	60DICB0080_OUT	0.29	70	30.1	0.0014	Residential - LD Heavy Clay	0.04	0.05	0.11
60DICB0081	60DICB0081_OUT	0.66	70	45.7	0.0013	Residential - LD Heavy Clay	0.08	0.12	0.24
60DICB0128	60DICB0128_OUT	0.45	67	37.6	0.0013	Residential - LD Cul-Sac	0.05	0.07	0.15
60DICB0198	60DICB0198_OUT	0.37	67	34.3	0.0013	Residential - LD Cul-Sac	0.04	0.06	0.13
60RYCB2000	60RYCB2000_OUT	0.86	8	52.4	0.0004	Open Spaces	0	0.01	0.03
60STCB0002	60STCB0002_OUT	3.29	13	102.3	0.0006	EXTERNAL DRAINAGE W/ SOME URBAN	0.09	0.12	0.25
60STCB0008	60STCB0008_OUT	2.5	13	89.3	0.0008	EXTERNAL DRAINAGE W/ SOME URBAN	0.07	0.09	0.2
60STCB0023	60STCB0023_OUT	1.61	40	71.5	0.0011	Mixed LD RES with Commercial.	0.11	0.15	0.31
60STCB0038	60STCB0038_OUT	6.48	13	143.6	0.0004	EXTERNAL DRAINAGE W/ SOME URBAN	0.16	0.23	0.46
60STCB0044	60STCB0044_OUT	1.13	94	60.1	0.0005	ICI - Heavy Clay	0.16	0.25	0.49
60STCB0045	60STCB0045_OUT	1.56	40	70.4	0.002	Mixed LD RES with Commercial.	0.11	0.15	0.31
60STCB0049	60STCB0049_OUT	0.29	70	30.2	0.0045	Residential - LD Heavy Clay	0.04	0.06	0.12
60STCB0051	60STCB0051_OUT	0.13	70	20.7	0.0004	Residential - LD Heavy Clay	0.02	0.03	0.05
60STCB0055	60STCB0055_OUT	0.58	40	42.8	0.0013	Mixed LD RES with Commercial.	0.04	0.06	0.12
60STCB0057	60STCB0057_OUT	0.45	40	38	0.0018	Mixed LD RES with Commercial.	0.03	0.05	0.1
60STCB0059	60STCB0059_OUT	0.39	40	35.1	0.0017	Mixed LD RES with Commercial.	0.03	0.04	0.09
60STCB0060	60STCB0060_OUT	0.6	40	43.8	0.0002	Mixed LD RES with Commercial.	0.04	0.06	0.11
60STCB0061	60STCB0061_OUT	0.55	40	41.7	0.0013	Mixed LD RES with Commercial.	0.04	0.05	0.11
60STCB0064	60STCB0054	0.68	94	46.4	0.0012	ICI - Heavy Clay	0.12	0.17	0.32
60STCB0068	60STCB0068_OUT	0.47	40	38.6	0.0005	Mixed LD RES with Commercial.	0.03	0.05	0.09
60STCB0073	60STCB0073_OUT	1.8	40	75.8	0.0002	Mixed LD RES with Commercial.	0.1	0.15	0.3
60STCB0075	60STCB0075_OUT	1.19	64	61.7	0.0008	School	0.14	0.2	0.37
60STCB0078	60STCB0064_OUT	0.35	94	33.2	0.0025	ICI - Heavy Clay	0.07	0.09	0.17
60STCB0079	60STCB0079_OUT	0.57	40	42.7	0.0021	Mixed LD RES with Commercial.	0.04	0.06	0.12
60STCB0082	60STCB0082_OUT	0.39	70	35.4	0.0008	Residential - LD Heavy Clay	0.05	0.07	0.14
60STCB0083	60STCB0078_OUT	0.33	94	32.2	0.0006	ICI - Heavy Clay	0.06	0.08	0.15
60STCB0088	60STCB0088_OUT	1.24	70	62.7	0.0002	Residential - LD Heavy Clay	0.12	0.18	0.36
60STCB0090	60STCB0097_OUT	0.59	70	43.4	0.0015	Residential - LD Heavy Clay	0.08	0.11	0.21
60STCB0097	60STCB0103	0.67	70	46.2	0.0013	Residential - LD Heavy Clay	0.09	0.12	0.23
60STCB0098	60STCB0098_OUT	1.4	70	66.8	0.0005	Residential - LD Heavy Clay	0.15	0.23	0.44
60STCB0101	60STCB0101_OUT	0.51	70	40.2	0.0083	Residential - LD Heavy Clay	0.07	0.1	0.19
60STCB2000	60STCB2000_OUT	0.72	70	47.9	0.001	Residential - LD Heavy Clay	0.09	0.13	0.24
60STMH0008	60STMH0008_OUT	0.28	40	29.7	0.002	Mixed LD RES with Commercial.	0.02	0.03	0.06
60STMH0009	60STMH0009_OUT	0.26	70	28.6	0.0019	Residential - LD Heavy Clay	0.03	0.05	0.1
60STMH0010	60STMH0010_OUT	0.44	70	37.2	0.0003	Residential - LD Heavy Clay	0.05	0.08	0.15
60STMH0011	60STMH0011_OUT	0.27	70	29.2	0.0124	Residential - LD Heavy Clay	0.04	0.05	0.11
60STMH0014	60STMH0014_OUT	0.97	70	55.5	0.001	Residential - LD Heavy Clay	0.12	0.17	0.32
60STMH0015	60STMH0015_OUT	0.63	70	44.9	0.0005	Residential - LD Heavy Clay	0.08	0.11	0.21
60STMH0016	60STMH0016_OUT	0.71	70	47.6	0.0005	Residential - LD Heavy Clay	0.08	0.12	0.24
60STMH0017	60STMH0017_OUT	0.68	70	46.6	0.0005	Residential - LD Heavy Clay	0.08	0.12	0.22
60STMH0019	60STMH0019_OUT	0.46	40	38.1	0.0011	Mixed LD RES with Commercial.	0.03	0.04	0.1
60STMH0020	60STMH0020_OUT	0.84	70	51.8	0.0022	Residential - LD Heavy Clay	0.11	0.16	0.31
60STMH0193	60STMH0193_OUT	0.95	70	55.1	0.0053	Residential - LD Heavy Clay	0.13	0.18	0.35
60STMH2000	60STMH2000_OUT	1.5	70	69.2	0.001	Residential - LD Heavy Clay	0.18	0.26	0.5
DICB026	DICB026_OUT	0.17	70	23.5	0.0006	Residential - LD Heavy Clay	0.02	0.03	0.06
60CULV2003.1	60CULV2004c	1.54	70	70	0.0002	Residential - LD Heavy Clay	0.14	0.21	0.44
60CULV2004.1	60CULV2004a	16.73	13	230.8	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.36	0.53	1.05
60CULV2006.1	60CULV2006	370.79	8	1086.4	0.0015	Agricultural	1.79	2.71	5.78
60CULV2000.1	60CULV2000	21.39	8	260.9	0.0009	Agricultural	0.13	0.19	0.45
60CULV2000.4	60SWALE2001b	1.41	70	66.9	0.0017	Residential - LD Heavy Clay	0.17	0.25	0.47
60CULV2001.2	60CULV2001	1.22	70	62.2	0.0002	Residential - LD Heavy Clay	0.11	0.18	0.36
60CULV2005.1	60CULV2005b	1.64	94	72.1	0.0209	ICI - Heavy Clay	0.31	0.44	0.79
60CULV2005.4	60STOV2009	1.18	70	61.2	0.0209	Residential - LD Heavy Clay	0.16	0.23	0.48
60CULV2007.1	60CULV2006d	4.48	13	119.4	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.11	0.16	0.31
60CULV2008.1	60CULV2007d	2.6	40	91	0.0002	Mixed LD RES with Commercial.	0.14	0.21	0.42
60CULV2009.1	60CULV2008d	1.78	40	75.3	0.0002	Mixed LD RES with Commercial.	0.1	0.15	0.3
60CULV2011.4	60CULV2011d	9.22	8	171.3	0.0002	Open Spaces	0.04	0.05	0.13
60CULV2012.4	60CULV2012d	3.23	64	101.4	0.0002	School	0.24	0.39	0.81
60CULV2013.4	60STOF2009_OUT	1.85	8	76.7	0.0001	Open Spaces	0.01	0.01	0.04
60STOF2000a	J4	1.04	13	57.6	0.0003	EXTERNAL DRAINAGE W/ SOME URBAN	0.03	0.04	0.08
60STOF2004a	60STOF2004a_OUT	0.51	40	40.3	0.0002	Mixed LD RES with Commercial.	0.03	0.05	0.09

Existing Condition Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60STOF2007	60CULV2010d	1.21	94	62	0.0004	ICI - Heavy Clay	0.17	0.25	0.5
60STOF2009	60STOF2009_OUT	27.28	8	294.7	0.0001	Agricultural	0.13	0.2	0.43
60STOV2001	60STOV2001_OUT	2.01	70	79.9	0.0002	Residential - LD Heavy Clay	0.17	0.26	0.55
60STOV2002	60STOV2002_OUT	6.41	8	142.8	0.0002	Open Spaces	0.03	0.04	0.09
60STOV2011	60STOV2011_OUT	0.91	70	53.7	0.0001	Residential - LD Heavy Clay	0.08	0.12	0.25
60STOV2016	60STOV2016_OUT	0.77	70	49.5	0.0011	Residential - LD Heavy Clay	0.1	0.14	0.27
60SWALE2002.1	60SWALE2002	3.49	8	105.5	0.0002	Open Spaces	0.01	0.02	0.07
60SWALE2003a	60SWALE2003a_OUT	0.91	13	53.9	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.02	0.03	0.07
60SWALE2004.1	60SWALE2004a	7.68	8	156.4	0.0002	Agricultural	0.04	0.07	0.15
60SWALE2004.1.9	60SWALE2004a	0.55	70	41.9	0.0002	Residential - LD Heavy Clay	0.06	0.09	0.17
CA_314,_315,_316	CA_314,_315,_316_OUT	231.21	8	857.9	0.0015	Agricultural	1.19	1.79	3.85
CULV025.1	60CULV2002e	3.86	8	110.8	0.0002	Open Spaces	0.02	0.02	0.08
EAST_OUTFALL	60CULV2012d	36.23	8	339.6	0.0002	Agricultural	0.18	0.27	0.59
north_culvert	north_culvert_a	12.24	13	197.4	0.0035	EXTERNAL DRAINAGE W/ SOME URBAN	0.32	0.46	0.93
Ultimate_Outlet_SE	CA_314,_315,_316_OUT	421.32	8	1158.1	0.0015	Agricultural	1.99	3.03	6.51
60STCB0107	60STCB0103	0.49	40	89.8	0.0023	Mixed LD RES with Commercial.	0.03	0.05	0.13
60STOF2000.4.1	60SWALE2003b	5.32	8	540	0.0003	Agricultural	0.03	0.06	0.3
60STOF2003-ex	60STOF2003	3.56	13	109.2	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.09	0.13	0.25
60STOV2006	60STOV2006.1	2.6	40	117.3	0.0002	Mixed LD RES with Commercial.	0.15	0.22	0.42
60UNCON0001	60UNCON0001_OUT	83.79	8	516.7	0.0005	Agricultural	0.43	0.64	1.4
CNR_culv_a	CNR_culv_a_OUT	25.1	13	282.4	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.5	0.76	1.52
JM'1'	60STMH0272_OUT	0.27	40	29.2	0.0004	Mixed LD RES with Commercial.	0.02	0.03	0.05
JM'2'	JM'2'_OUT	0.41	40	36	0.0001	Mixed LD RES with Commercial.	0.03	0.04	0.07
JM'3'	60STMH0279_OUT	0.29	40	30.4	0.0005	Mixed LD RES with Commercial.	0.02	0.03	0.05
JM'3b'	60STMH0279_OUT	0.44	40	37.5	0.0005	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM'4'	60STMH0282_OUT	0.25	8	28.2	0.0008	Open Spaces	0	0	0.01
JM'5'	60STMH0289_OUT	0.3	40	31	0.0006	Mixed LD RES with Commercial.	0.02	0.03	0.06
JM'6'	60STMH0303_OUT	0.45	40	37.7	0.0003	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM'7'	60STMH0300_OUT	0.2	40	25.1	0.0004	Mixed LD RES with Commercial.	0.01	0.02	0.04
JM'7'comm	60STMH0300_OUT	0.67	70	46	0.0004	Residential - LD Heavy Clay	0.08	0.11	0.22
JM'8'	60STMH0296_OUT	0.75	40	48.8	0.0001	Mixed LD RES with Commercial.	0.04	0.06	0.12
JM11	60STMH0339_OUT	0.6	40	43.6	0.0004	Mixed LD RES with Commercial.	0.04	0.06	0.11
JM12	60STMH0338_OUT	0.42	40	36.7	0.0004	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM16	60STMH0336_OUT	0.51	40	40.2	0.0002	Mixed LD RES with Commercial.	0.03	0.05	0.09
JM17	60STMH0335_OUT	0.62	40	44.2	0.0004	Mixed LD RES with Commercial.	0.04	0.06	0.11
JM18	60STMH0334_OUT	0.47	40	38.5	0.0001	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM19	60STMH0332_OUT	0.63	40	44.8	0.0023	Mixed LD RES with Commercial.	0.04	0.06	0.12
JM8	60STMH0341_OUT	0.43	40	37	0.0002	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM_Pond_1	JSWMF-4	0.31	70	31.2	0.0001	Residential - LD Heavy Clay	0.03	0.05	0.1
JM_Pond_2	JSMF-5	1.07	70	58.4	0.0001	Residential - LD Heavy Clay	0.09	0.14	0.29
w1	w1_OUT	0.87	70	52.7	0.0008	Residential - LD Heavy Clay	0.11	0.15	0.29
w2	w2_OUT	0.5	70	39.7	0.0009	Residential - LD Heavy Clay	0.06	0.09	0.17
w3	w3_OUT	0.6	70	43.5	0.004	Residential - LD Heavy Clay	0.08	0.11	0.22
walker_SWM_FACILITY	JSWMF-3	0.63	70	44.8	0.0001	Residential - LD Heavy Clay	0.06	0.09	0.19
DN_8	J3	2.4	13	87.3	0.0001	EXTERNAL DRAINAGE W/ SOME URBAN	0.06	0.08	0.16
EX_S1	St_EX_S1	3.68	8	150	0.00211	Agricultural	0.02	0.05	0.24
60STOF2000.4.1_1	60CULV2012b	4.48	8	245	0.0003	Agricultural	0.03	0.04	0.17

Future Population Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60CBMH0018	60CBMH0018_OUT	0.863	70	52.4	0.2	Residential_-_LD_Heavy_Clay	0.09	0.13	0.26
60CBMH0026	60CBMH0026_OUT	0.827	70	51.3	0.6	Residential_-_LD_Heavy_Clay	0.1	0.14	0.27
60CBMH0037	60CBMH0037_OUT	2.477	70	88.8	0.7	Residential_-_LD_Heavy_Clay	0.26	0.39	0.78
60CBMH0069	60CBMH0069_OUT	0.07	70	14.9	2.7	Residential_-_LD_Heavy_Clay	0.01	0.01	0.03
60CBMH0070	60CBMH0070_OUT	1.032	70	83.85	0.7	Residential_-_LD_Heavy_Clay	0.13	0.19	0.36
60CBMH0072	60CBMH0072_OUT	0.197	70	25	2.7	Residential_-_LD_Heavy_Clay	0.03	0.04	0.07
60CBMH0074	60CBMH0074_OUT	0.41	70	36.1	2.2	Residential_-_LD_Heavy_Clay	0.05	0.08	0.15
60CBMH0075	60CBMH0075_OUT	0.227	70	26.9	0.4	Residential_-_LD_Heavy_Clay	0.03	0.04	0.08
60CBMH0077	60CBMH0077_OUT	0.355	67	33.6	2.4	Residential_-_LD_Cul-Sac	0.04	0.06	0.13
60CBMH0079	60CBMH0079_OUT	0.069	70	14.8	5.2	Residential_-_LD_Heavy_Clay	0.01	0.01	0.03
60CBMH0082	60CBMH0082_OUT	0.618	70	44.4	2.6	Residential_-_LD_Heavy_Clay	0.08	0.12	0.23
60CBMH0082.1	60STCB0082_OUT	0.736	70	48.4	0.8	Residential_-_LD_Heavy_Clay	0.09	0.13	0.26
60CBMH0142	60CBMH0142_OUT	1.06	94	58.1	0.5	ICI_-_Heavy_Clay	0.16	0.23	0.46
60CBMH2000	60CBMH2000_OUT	1.499	70	59.083	0.7	Residential_-_LD_Heavy_Clay	0.16	0.24	0.47
60CULV2002.4	60CULV2002d	0.135	70	20.8	1.5	Residential_-_LD_Heavy_Clay	0.02	0.03	0.05
60CULV2013.1	M_CULV_c	0.712	70	47.6	0.5	Residential_-_LD_Heavy_Clay	0.08	0.12	0.24
60DICB0080	60DICB0080_OUT	0.285	70	30.1	1.4	Residential_-_LD_Heavy_Clay	0.04	0.05	0.11
60DICB0081	60DICB0081_OUT	0.657	70	45.7	1.3	Residential_-_LD_Heavy_Clay	0.08	0.12	0.24
60DICB0128	60DICB0128_OUT	0.445	67	37.6	1.3	Residential_-_LD_Cul-Sac	0.05	0.07	0.15
60DICB0198	60DICB0198_OUT	0.369	67	34.3	1.3	Residential_-_LD_Cul-Sac	0.04	0.06	0.13
60RYCB2000	60RYCB2000_OUT	0.861	8	52.4	0.4	Open_Spaces	0	0.01	0.03
60STCB0002	60STCB0002_OUT	3.29	13	102.3	0.6	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.09	0.12	0.25
60STCB0008	60STCB0008_OUT	2.503	13	89.3	0.8	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.07	0.09	0.2
60STCB0023	60STCB0023_OUT	1.606	40	71.5	1.1	Mixed_LD_RES_with_Commercial.	0.11	0.15	0.31
60STCB0038	60STCB0038_OUT	6.476	13	143.6	0.4	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.16	0.23	0.46
60STCB0044	60STCB0044_OUT	1.134	94	60.1	0.5	ICI_-_Heavy_Clay	0.16	0.25	0.49
60STCB0045	60STCB0045_OUT	1.556	40	70.4	2	Mixed_LD_RES_with_Commercial.	0.11	0.15	0.31
60STCB0049	60STCB0049_OUT	0.286	70	30.2	4.5	Residential_-_LD_Heavy_Clay	0.04	0.06	0.12
60STCB0051	60STCB0051_OUT	0.134	70	20.7	0.4	Residential_-_LD_Heavy_Clay	0.02	0.03	0.05
60STCB0055	60STCB0055_OUT	0.575	40	42.8	1.3	Mixed_LD_RES_with_Commercial.	0.04	0.06	0.12
60STCB0057	60STCB0057_OUT	0.453	40	38	1.8	Mixed_LD_RES_with_Commercial.	0.03	0.05	0.1
60STCB0059	60STCB0059_OUT	0.386	40	35.1	1.7	Mixed_LD_RES_with_Commercial.	0.03	0.04	0.09
60STCB0060	60STCB0060_OUT	0.603	40	43.8	0.2	Mixed_LD_RES_with_Commercial.	0.04	0.06	0.11
60STCB0061	60STCB0061_OUT	0.547	40	41.7	1.3	Mixed_LD_RES_with_Commercial.	0.04	0.05	0.11
60STCB0064	60STCB0054	0.678	94	46.4	1.2	ICI_-_Heavy_Clay	0.12	0.17	0.32
60STCB0068	60STCB0068_OUT	0.467	40	38.6	0.5	Mixed_LD_RES_with_Commercial.	0.03	0.05	0.09
60STCB0073	60STCB0073_OUT	1.803	40	75.8	0.2	Mixed_LD_RES_with_Commercial.	0.1	0.15	0.3
60STCB0075	60STCB0075_OUT	1.194	64	61.7	0.8	School	0.14	0.2	0.37
60STCB0078	60STCB0064_OUT	0.346	94	33.2	2.5	ICI_-_Heavy_Clay	0.07	0.09	0.17
60STCB0079	60STCB0079_OUT	0.572	40	42.7	2.1	Mixed_LD_RES_with_Commercial.	0.04	0.06	0.12
60STCB0082	60STCB0082_OUT	0.393	70	35.4	0.8	Residential_-_LD_Heavy_Clay	0.05	0.07	0.14
60STCB0083	60STCB0078_OUT	0.325	94	32.2	0.6	ICI_-_Heavy_Clay	0.06	0.08	0.15
60STCB0088	60STCB0088_OUT	1.237	70	62.7	0.2	Residential_-_LD_Heavy_Clay	0.12	0.18	0.36
60STCB0090	60STCB0097_OUT	0.592	70	43.4	1.5	Residential_-_LD_Heavy_Clay	0.08	0.11	0.21
60STCB0097	60STCB0103	0.67	70	46.2	1.3	Residential_-_LD_Heavy_Clay	0.09	0.12	0.23
60STCB0098	60STCB0098_OUT	1.402	70	66.8	0.5	Residential_-_LD_Heavy_Clay	0.15	0.23	0.44
60STCB0101	60STCB0101_OUT	0.508	70	40.2	8.3	Residential_-_LD_Heavy_Clay	0.07	0.1	0.19
60STCB2000	60STCB2000_OUT	0.719	70	47.9	1	Residential_-_LD_Heavy_Clay	0.09	0.13	0.24
60STMH0008	60STMH0008_OUT	0.278	40	29.7	2	Mixed_LD_RES_with_Commercial.	0.02	0.03	0.06
60STMH0009	60STMH0009_OUT	0.257	70	28.6	1.9	Residential_-_LD_Heavy_Clay	0.03	0.05	0.1
60STMH0010	60STMH0010_OUT	0.435	70	37.2	0.3	Residential_-_LD_Heavy_Clay	0.05	0.08	0.15
60STMH0011	60STMH0011_OUT	0.268	70	29.2	12.4	Residential_-_LD_Heavy_Clay	0.04	0.05	0.11
60STMH0014	60STMH0014_OUT	0.969	70	55.5	1	Residential_-_LD_Heavy_Clay	0.12	0.17	0.32
60STMH0015	60STMH0015_OUT	0.632	70	44.9	0.5	Residential_-_LD_Heavy_Clay	0.08	0.11	0.21
60STMH0016	60STMH0016_OUT	0.713	70	47.6	0.5	Residential_-_LD_Heavy_Clay	0.08	0.12	0.24
60STMH0017	60STMH0017_OUT	0.682	70	46.6	0.5	Residential_-_LD_Heavy_Clay	0.08	0.12	0.22
60STMH0019	60STMH0019_OUT	0.455	40	38.1	1.1	Mixed_LD_RES_with_Commercial.	0.03	0.04	0.1
60STMH0020	60STMH0020_OUT	0.843	70	51.8	2.2	Residential_-_LD_Heavy_Clay	0.11	0.16	0.31
60STMH0193	60STMH0193_OUT	0.954	70	55.1	5.3	Residential_-_LD_Heavy_Clay	0.13	0.18	0.35
60STMH2000	60STMH2000_OUT	1.504	70	69.2	1	Residential_-_LD_Heavy_Clay	0.18	0.26	0.5
DICB026	DICB026_OUT	0.173	70	23.5	0.6	Residential_-_LD_Heavy_Clay	0.02	0.03	0.06
60CULV2003.1	60CULV2004c	1.54	70	70	0.2	Residential_-_LD_Heavy_Clay	0.14	0.21	0.44
60CULV2004.1	60CULV2004a	16.733	13	230.8	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.36	0.53	1.05
60STOV2011	60STOV2011_OUT	0.906	70	53.7	0.1	Residential_-_LD_Heavy_Clay	0.08	0.12	0.25
60STOV2016	60STOV2016_OUT	0.77	70	49.5	1.1	Residential_-_LD_Heavy_Clay	0.1	0.14	0.27
w1	w1_OUT	0.8723	70	52.7	0.8	Recent_Development	0.11	0.15	0.29
w2	w2_OUT	0.4962	70	39.7	0.9	Recent_Development	0.06	0.09	0.17
w3	w3_OUT	0.5954	70	43.5	4	Recent_Development	0.08	0.11	0.22
walker_SWM_FACILITY	JSWMF-3	0.6298	70	44.8	0.1	Recent_Development	0.06	0.09	0.19
60CULV2000.1	60CULV2000	21.387	8	260.9	0.9	Agricultural	0.13	0.19	0.45
60CULV2000.4	60SWALE2001b	1.407	70	66.9	1.7	Residential_-_LD_Heavy_Clay	0.17	0.25	0.47
60CULV2001.2	60CULV2001	1.215	70	62.2	0.2	Residential_-_LD_Heavy_Clay	0.11	0.18	0.36
60CULV2005.1	60CULV2005b	1.635	94	72.1	20.9	ICI_-_Heavy_Clay	0.31	0.44	0.79
60CULV2005.4	60STOV2009	1.177	70	61.2	20.9	Residential_-_LD_Heavy_Clay	0.16	0.23	0.48
60CULV2007.1	60CULV2006d	4.478	13	119.4	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.11	0.16	0.31
60CULV2008.1	60CULV2007d	2.603	40	91	0.2	Mixed_LD_RES_with_Commercial.	0.14	0.21	0.42
60CULV2009.1	60CULV2008d	1.781	40	75.3	0.2	Mixed_LD_RES_with_Commercial.	0.1	0.15	0.3

Future Population Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60CULV2011.4	60CULV2011d	8.493	8	164.4	0.2	Open_Spaces	0.03	0.05	0.13
60CULV2013.4	60STOF2009_OUT	1.846	8	76.7	0.1	Open_Spaces	0.01	0.01	0.04
60STOF2000a	J4	1.041	13	57.6	0.3	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.03	0.04	0.08
60STOF2002.1	60STOF2002	0.374	13	34.5	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.01	0.01	0.03
60STOF2004a	60STOF2004a_OUT	0.511	40	40.3	0.2	Mixed_LD_RES_with_Commercial.	0.03	0.05	0.09
60STOF2007	60CULV2010d	1.207	94	62	0.4	ICI_-_Heavy_Clay	0.17	0.25	0.5
60STOV2001	60STOV2001_OUT	2.005	70	79.9	0.2	Residential_-_LD_Heavy_Clay	0.17	0.26	0.55
60STOV2002	60STOV2002_OUT	6.405	8	142.8	0.2	Open_Spaces	0.03	0.04	0.09
60SWALE2002.1	60SWALE2002	3.494	8	105.5	0.2	Open_Spaces	0.01	0.02	0.07
60SWALE2003a	60SWALE2003a_OUT	0.912	13	53.9	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.02	0.03	0.07
60SWALE2004.1	60SWALE2004a	7.681	8	156.4	0.2	Agricultural	0.04	0.07	0.15
60SWALE2004.1.9	60SWALE2004a	0.551	70	41.9	0.2	Residential_-_LD_Heavy_Clay	0.06	0.09	0.17
60UNCON0001	60UNCON0001_OUT	82.336	8	511.9	0.5	Agricultural	0.42	0.63	1.37
CA_314,_315,_316	CA_314,_315,_316_OUT	229.674	8	858.6	1.5	Agricultural	1.19	1.78	3.83
CNR_CULV_c.1	CNR_CULV_c	1.076	13	58.5	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.03	0.04	0.08
CULV025.1	60CULV2002e	3.857	8	110.8	0.2	Open_Spaces	0.02	0.02	0.08
Ultimate_Outlet_SE	CA_314,_315,_316_OUT	421.318	8	1158.1	1.5	Agricultural	1.99	3.03	6.51
D_SWM_FACILITY.1	D_SWM_FACILITY	0.989	40	56.1	0.2	Future_Development	0.06	0.09	0.17
D1	D1_OUT	1.284	40	63.9	0.2	Future_Development	0.07	0.11	0.21
D2	D2_OUT	2.029	40	80.4	0.3	Future_Development	0.12	0.17	0.33
D3	D3_OUT	1.191	40	61.6	24.8	Future_Development	0.08	0.12	0.25
JM1	JM1_OUT	1.097	40	59.1	0.1	Future_Development	0.06	0.09	0.17
JM10	JM10_OUT	0.537	40	41.3	0.1	Future_Development	0.03	0.05	0.09
JM13	JM13_OUT	1.106	40	59.3	0.1	Future_Development	0.06	0.09	0.18
JM14	JM14_OUT	1.055	40	57.9	0.6	Future_Development	0.07	0.1	0.19
JM2	JM2_OUT	0.512	40	40.4	0.1	Future_Development	0.03	0.05	0.09
JM3	JM3_OUT	0.76	40	49.2	0.6	Future_Development	0.05	0.07	0.14
JM4	JM4_OUT	0.811	40	50.8	0.1	Future_Development	0.05	0.07	0.13
JM5	JM5_OUT	1.092	40	58.9	0.1	Future_Development	0.06	0.09	0.18
JM6	JM6_OUT	0.652	40	45.5	0.1	Future_Development	0.04	0.06	0.11
JM7	JM7_OUT	0.568	40	42.5	0.1	Future_Development	0.03	0.05	0.1
M1	M1_OUT	0.564	70	42.4	3.3	Residential_-_LD_Heavy_Clay	0.08	0.11	0.22
M3	M3_OUT	0.784	67	49.9	1.7	Residential_-_LD_Cul-Sac	0.09	0.13	0.26
M4	M4_OUT	0.666	70	46	0.3	Residential_-_LD_Heavy_Clay	0.07	0.11	0.22
STCP-5	STCP-5_OUT	0.418	70	36.5	5.4	Residential_-_LD_Heavy_Clay	0.06	0.08	0.17
60CULV2006.1	60CULV2006	371.578	8	1086.4	1.5	Agricultural	1.79	2.71	5.79
CNR_culv_a	CNR_culv_a_OUT	18.1134	13	282.4	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.4	0.59	1.17
60STOF2009	60STOF2009_OUT	27.2955	8	294.7	0.1	Agricultural	0.13	0.2	0.43
north_culvert	north_culvert_a	12.2446	13	197.4	3.5	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.32	0.46	0.93
60STCB0107	60STCB0103	0.4906	40	89.8	2.3	Mixed_LD_RES_with_Commercial	0.03	0.05	0.13
60STOV2006	60STOV2006.1	2.5991	40	117.3	0.2	Mixed_LD_RES_with_Commercial	0.15	0.22	0.42
60STOF2000.4.1	60SWALE2003b	5.3221	8	540	0.3	Agricultural	0.03	0.06	0.3
DN_8	J3	2.3981	13	87.3	0.1	Recent_Development	0.06	0.08	0.16
JM_Pond_1	JSWMF-4	0.3066	70	31.2	0.1	Recent_Development	0.03	0.05	0.1
JM_Pond_2	JSMF-5	1.0719	70	58.4	0.1	Recent_Development	0.09	0.14	0.29
JM'1'	60STMH0272_OUT	0.2684	40	29.2	0.4	Recent_Development	0.02	0.03	0.05
JM11	60STMH0339_OUT	0.5988	40	43.6	0.4	Recent_Development	0.04	0.06	0.11
JM12	60STMH0338_OUT	0.4175	40	36.7	0.4	Recent_Development	0.03	0.04	0.08
JM16	60STMH0336_OUT	0.5073	40	40.2	0.2	Recent_Development	0.03	0.05	0.09
JM17	60STMH0335_OUT	0.6152	40	44.2	0.4	Recent_Development	0.04	0.06	0.11
JM18	60STMH0334_OUT	0.4668	40	38.5	0.1	Recent_Development	0.03	0.04	0.08
JM19	60STMH0332_OUT	0.6319	40	44.8	2.3	Recent_Development	0.04	0.06	0.12
JM'2'	JM'2'_OUT	0.4076	40	36	0.1	Recent_Development	0.03	0.04	0.07
JM'3'	60STMH0279_OUT	0.2909	40	30.4	0.5	Recent_Development	0.02	0.03	0.05
JM'3b'	60STMH0279_OUT	0.4418	40	37.5	0.5	Recent_Development	0.03	0.04	0.08
JM'4'	60STMH0282_OUT	0.2493	8	28.2	0.8	Recent_Development	0.00	0.00	0.01
JM'5'	60STMH0289_OUT	0.3025	40	31	0.6	Recent_Development	0.02	0.03	0.06
JM'6'	60STMH0303_OUT	0.4456	40	37.7	0.3	Recent_Development	0.03	0.04	0.08
JM'7'	60STMH0300_OUT	0.1988	40	25.1	0.4	Recent_Development	0.01	0.02	0.04
JM'7'comm	60STMH0300_OUT	0.6658	70	46	0.4	Recent_Development	0.08	0.11	0.22
JM8	60STMH0341_OUT	0.4298	40	37	0.2	Recent_Development	0.03	0.04	0.08
JM'8'	60STMH0296_OUT	0.7501	40	48.8	0.1	Recent_Development	0.04	0.06	0.12
E_Talbot	60CULV2012a	4.527	8	120	0.65	Agricultural	0.03	0.04	0.14
60CULV2012.4	60CULV2012d	3.232	64	101.4	0.2	School	0.24	0.39	0.81
EAST_OUTFALL	60CULV2012d	36.064	8	338.8	0.2	Agricultural	0.18	0.27	0.59

Appendix D

Transportation Report

Memorandum

13 November 2018
Project: 180197

To
Jane Wilson
Environmental Engineer
J.L. Richards & Associates Limited

From
Rajan Philips, P.Eng.
Senior Transportation Consultant
Paradigm Transportation Solutions Limited

RE: JARVIS MASTER SERVICING PLAN, TECHNICAL MEMORADUM 1, SUMMARY OF EXISTING CONDITIONS

Introduction

Haldimand County is undertaking an update of the 2010 Master Servicing Plan (MSP) for the community of Jarvis in support of planned growth and intensification identified in the County's Official Plan. The updated MSP will address the four servicing components (transportation, storm, water and wastewater) of the 2010 Jarvis MSP corresponding to changes in land use and growth forecasts within the study area, as well as changes to existing conditions and related assumptions based on growth that has occurred within the study area.

The study area for the update includes the network of municipal services, local environment, and community make up, consistent with the 2010 Jarvis MSP study area. The community of Jarvis is built along and adjacent to Highway 6 (Main Street) and Highway 3 (Talbot Street) in the southwest part of Haldimand County. The study area road system is centered on the intersection of Highway 6 and Highway 3 and is generally bounded by Haldimand Road 69 to the north, Haldimand Road 55 to the east, Haldimand Road 70 to the west, and Concession 6 Walpole to the south. Both Highway 6 and Highway 3 are "connecting links" in the Provincial highway network. All other roads in Jarvis are local roads.

The MSP update, including transportation, is being undertaken within the following framework:

- Class Environmental Assessment Master Planning
- Background Review and Updates to Existing Conditions

- Growth Forecast and Assessment of Future Needs
- Development of Preferred Servicing Strategies
- Implementation Plan Development and Final Report

The purpose of this memorandum is to provide background review and updates to existing conditions.

Background

The 2010 MSP, 2009 Trails Master Plan and the 2013 Streetscape Plan provide the background to addressing the transportation component of the current Master Servicing Plan Update.

The transportation component of the 2010 Jarvis MSP identified the intersection of Main Street (Highway 6) and Talbot Street (Highway 3) and the intersection of Main Street and Nanticoke Road as “problem areas” in the community. Overall, however, the key intersections in Jarvis were found to operate at Level-of-Service (LOS) ‘D’, or better.

The 2010 MSP, which identified infrastructure requirements over a 20-year timeframe, recommended the following transportation initiatives:

- Monitoring and implementing mitigative measures (e.g., parking restrictions, revised lane designations) to improve LOS and safety at the Main Street and Talbot Street intersection.
- Need for a new collector road connecting to Highway 3 to accommodate developments in southwest Jarvis.
- Addition of sidewalks on one or both sides of Highway 3 from Highway 6 to the easterly Town limits.
- Potential re-striping of Highway 6 and Highway 3 to accommodate bicycle lanes.

Prior to the 2010 MSP, the County completed the *Trails Master Plan and Partnership Framework Study* in 2009, which identified short and long-term trail network needs and priorities in Jarvis, including recommendations for future bikeways.

In addition, the *Jarvis Streetscape Plan* was completed in 2013 for the purpose of creating visually attractive public spaces and pedestrian friendly environments in the Jarvis central business area.

Existing Transportation System Update

Roadways

Figure 1 (attached) illustrates the study area roadways and the intersections analyzed under existing traffic conditions, noted as follows:

- Highway 6 & Nanticoke Creek Parkway;
- Highway 6 (Main Street) & Ontario Highway 3 (Talbot Street);
- Highway 3 (Talbot Street) & Craddock Boulevard;
- Highway 3 (Talbot Street) & Saunders Drive; and
- Highway 3 (Talbot Street) & Haldimand Road 55.

The main study area roadways include Highway 6, Highway 3, Craddock Boulevard, Saunders Drive and Haldimand Road 55. The characteristics of these roadways are as follows:

- **Highway 6** is a north-south, two-lane, roadway that operates under the jurisdiction of the Ontario Ministry of Transportation. The roadway is classified as a provincial highway in the County's Official Plan.[1] The roadway has an urban cross-section in the Town of Jarvis, and a rural cross-section outside of the urban built-up area. The posted maximum speed limit varies from 50 kilometres per hour within the Town, to 80 kilometres outside of the Town. Within the Town of Jarvis, the roadway is referred to as Main Street and serves as a connecting link. The surrounding land uses are predominantly low-density residential and agricultural.
- **Highway 3** is an east-west, two-lane, roadway that operates under the jurisdiction of the Ontario Ministry of Transportation. The roadway is classified as a provincial highway in the County's Official Plan. The roadway has an urban cross-section within the Town of Jarvis, and a rural cross-section outside of the urban built-up area. The posted maximum speed limit varies from 50 kilometres per hour within the Town to 80 kilometres per hour outside of the Town. Within the urban area of the Town of Jarvis the roadway is referred to as Talbot Street and serves as a connecting link. The surrounding land uses are predominantly low-density residential and agricultural.
- **Nanticoke Creek Parkway (County Road 69)** is an east-west, two-lane roadway that operates under the jurisdiction of Haldimand County. The roadway is classified as an arterial road in the County's Official Plan. Within the study area, the roadway has a rural cross-section. The posted maximum speed limit is 80 kilometres per hour. The surrounding land uses are primarily agricultural.
- **Nanticoke Road (County Road 55)** is a north-south, two-lane roadway that operates under the jurisdiction of Haldimand County. The roadway is classified as an arterial road in the County's Official Plan. Within the study area, the roadway has a rural cross-

[1] Haldimand County. *Official Plan Schedule F.2: Haldimand County Southwest Transportation Plan.* Consolidated January 2014.

section. The posted maximum speed limit is 80 kilometres per hour. The surrounding land uses are primarily agricultural.

- **Craddock Boulevard** is a north-south, two-lane roadway that operates under the jurisdiction of Haldimand County. The roadway is classified as a local roadway in the County's Official Plan. Within the study area, the roadway has a semi-urban cross-section. The maximum speed limit is not posted and is assumed to be 50 kilometres per hour. The surrounding land uses are low-density residential.
- **Saunders Drive** is a north-south, two-lane roadway that operates under the jurisdiction of Haldimand County. The roadway is classified as a local roadway in the County's Official Plan. Within the study area, the roadway has an urban cross-section. The maximum speed limit is not posted and assumed to be 50 kilometres per hour. The surrounding land uses are low-density residential.

Figure 2 (attached) illustrates the existing lane configurations and traffic control at the study intersections.

Active Transportation

Sidewalks are generally provided on at least one side of the majority of the study roadways, in addition to other roadways in the Town. Sidewalks are provided on both sides of Main Street from Karsten Avenue to 190 metres north of Boyd Street. A further 500 metres of sidewalk is provided on the west side of Main Street north of an existing Tim Hortons restaurant. Sidewalks are provided on both sides of Talbot Street from approximately 255 metres west of Radical Street to 165 metres east of Saunders Drive.

Dedicated cycling facilities are not provided on any of the six (6) study roadways, requiring cyclists to share the roadway with motorists. The Haldimand County Cycling Map identifies five (5) general cycling routes navigating the County. None of the roadways in the Town of Jarvis form a part of these cycling routes.

Existing Traffic Volumes

Paradigm conducted eight-hour turning movement counts (TMCs) on Tuesday 02 October 2018 from 7:00 AM to 10:00 AM, 11:30 AM to 1:30 PM, and 3:00 PM to 6:00 PM. All traffic movements including pedestrian crossings were counted in 15-minute intervals and vehicles were classified by type. Due to the large distance between intersections, and the varying peak hours, volume balancing has not been applied.

The existing traffic conditions indicate AM peak hour volumes of approximately 210 to 275 vehicles on Main Street, and 125 to 150 vehicles on Talbot Street.

Similarly, the PM peak hour volumes range from approximately 280 to 390 vehicles on Main Street, and 156 to 170 vehicles on Talbot Street.

Figure 3 and **Figure 4** (attached) illustrate the existing AM and PM peak hour traffic volumes respectively.

Appendix A contains the raw turning movement count data.

Existing Traffic Operations

The study area intersections were analyzed under existing traffic conditions, using Synchro 9.2 software which implements Highway Capacity Manual (HCM) 2000 procedures.

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay related to the number of vehicles desiring to make a through or turning movement, compared to the estimated capacity for that movement. The capacity is based on several criteria including, but not limited to vehicle headways, intersection geometry, vehicle composition, opposing traffic flows, and for signalized intersections, signal timing. Capacity is evaluated in terms of the ratio of demand flow to capacity with an at-capacity condition represented by a v/c ratio of 1.00 (i.e. volume demand equals capacity).

Table 1 summarizes the level of service (LOS) criteria for signalized and stop-controlled intersections. The highest possible rating is LOS A, in which the average total delay is equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume-to-capacity ratio is greater than 1.00, the movement is classed as LOS F and improvements are implemented, if they are feasible. LOS E is generally used as a guideline for the determination of road improvements needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on capacity and safety considerations.

TABLE 1: 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

The intersection analyses considered the following measures of effectiveness:

- The volume-to-capacity ratio for each movement, where applicable;
- The LOS, based on the average control delay for each vehicle, for each turning movement; and

- The estimated 95th percentile queue length.

The key parameters used in the analysis include:

- Existing intersection lane configurations and traffic controls;
- Signal timing data as provided by Haldimand County, and included for reference in **Appendix A**;
- Heavy vehicle percentages, conflicting pedestrian volumes, and overall intersection peak hour factors (PHF) as derived from existing turning movement counts; and
- Synchro default values for all other inputs.

Table 2 summarizes the analysis results for the existing weekday AM and weekday PM peak hour intersection operations. The results indicate the study area intersections are operating with acceptable levels of service and well within capacity. No critical movements are identified at any of the study intersections.

Appendix B contains the detailed Synchro reports.

TABLE 2: EXISTING 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 - Highway 6 & Natnticoke Creek Parkway	TWSC	LOS	<	B	>	**B**	<	C	>	**C**	A	A	A	**A**	A	A	A	**A**	
			Delay	<	14	>	**14**	<	15	>	**15**	8	0	0	**1**	0	0	0	**0**	
			V/C	<	0.20	>		<	0.06	>		0.03	0.18	0.01		0.00	0.12	0.04		
			Q	<	6	>		<	2	>		1	0	0		0	0	0		
			Ex	<	-	>		<	-	>		120	-	120		90	-	90		
			Avail.	<	-	>		<	-	>		119	-	120		90	-	120		
	2 - Talbot Street & Main Street	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	13	>	**13**	<	12	>	**12**	<	12	>	**12**	<	12	>	**12**	**12**
			V/C	<	0.30	>		<	0.23	>		<	0.27	>		<	0.25	>		**0.28**
			Q	<	25	>		<	21	>		<	24	>		<	19	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	3 - Talbot Street & Craddock Boulevard	TWSC	LOS	<	A		**A**		A	>	**A**					<	A	>	**A**	
			Delay	<	0		**0**		0	>	**0**					<	10	>	**10**	
			V/C	<	0.00				0.10	>						<	0.03	>		
			Q	<	0				0	>						<	1	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	4 - Talbot Street & Saunders Drive	TWSC	LOS	<	A		**A**		A	>	**A**					<	A	>	**C**	
			Delay	<	0		**0**		0	>	**0**					<	1	>	**15**	
			V/C	<	0.00				0.00	>						<	0.00	>		
			Q	<	0				0	>						<	0	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	5 - Talbot Street & Haldimand Road 55	TCS	LOS	B	B	B	**B**	B	B	>	**B**	B	B	B	**B**	B	C	>	**C**	**B**
			Delay	13	13	13	**17**	13	14	>	**14**	19	20	18	**19**	18	21	>	**20**	**17**
			V/C	0.02	0.11	0.01		0.03	0.14	>		0.06	0.12	0.00		0.01	0.21	>		**0.17**
			Q	5	17	0		5	20	>		8	17	0		3	28	>		
			Ex	85	-	100		110	-	>		85	-	100		105	-	>		
			Avail.	80	-	100		105	-	>		77	-	100		102	-	>		
PM Peak Hour	1 - Highway 6 & Natnticoke Creek Parkway	TWSC	LOS	<	C	>	**C**	<	C	>	**C**	A	A	A	**A**	A	A	A	**A**	
			Delay	<	19	>	**19**	<	18	>	**18**	8	0	0	**1**	9	0	0	**0**	
			V/C	<	0.32	>		<	0.07	>		0.03	0.16	0.00		0.00	0.23	0.04		
			Q	<	11	>		<	2	>		1	0	0		0	0	0		
			Ex	<	-	>		<	-	>		120	-	120		90	-	90		
			Avail.	<	-	>		<	-	>		119	-	120		90	-	120		
	2 - Talbot Street & Main Street	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	15	>	**15**	<	12	>	**12**	<	12	>	**12**	<	18	>	**18**	**15**
			V/C	<	0.46	>		<	0.25	>		<	0.21	>		<	0.60	>		**0.53**
			Q	<	39	>		<	21	>		<	19	>		<	57	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	3 - Talbot Street & Craddock Boulevard	TWSC	LOS	<	A		**A**		A	>	**A**					<	B	>	**B**	
			Delay	<	1		**1**		0	>	**0**					<	10	>	**10**	
			V/C	<	0.02				0.12	>						<	0.02	>		
			Q	<	0				0	>						<	1	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	4 - Talbot Street & Saunders Drive	TWSC	LOS	<	A		**A**		A	>	**A**					<	A	>	**A**	
			Delay	<	1		**1**		0	>	**0**					<	10	>	**10**	
			V/C	<	0.01				0.11	>						<	0.02	>		
			Q	<	0				0	>						<	0	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	5 - Talbot Street & Haldimand Road 55	TCS	LOS	B	B	B	**B**	B	B	>	**B**	B	B	B	**B**	B	B	>	**B**	**B**
			Delay	13	14	13	**14**	13	14	>	**14**	19	20	18	**20**	19	19	>	**19**	**16**
			V/C	0.02	0.18	0.01		0.00	0.16	>		0.07	0.16	0.01		0.05	0.08	>		**0.17**
			Q	4	27	0		1	24	>		10	24	0		8	12	>		
			Ex	85	-	100		110	-	>		85	-	100		105	-	>		
			Avail.	81	-	100		109	-	>		75	-	100		98	-	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

<- Shared Left/Through Lane
>- Shared Right/Through Lane

We trust that this memorandum adequately summarizes the existing transportation conditions and operations in the study area intersections.

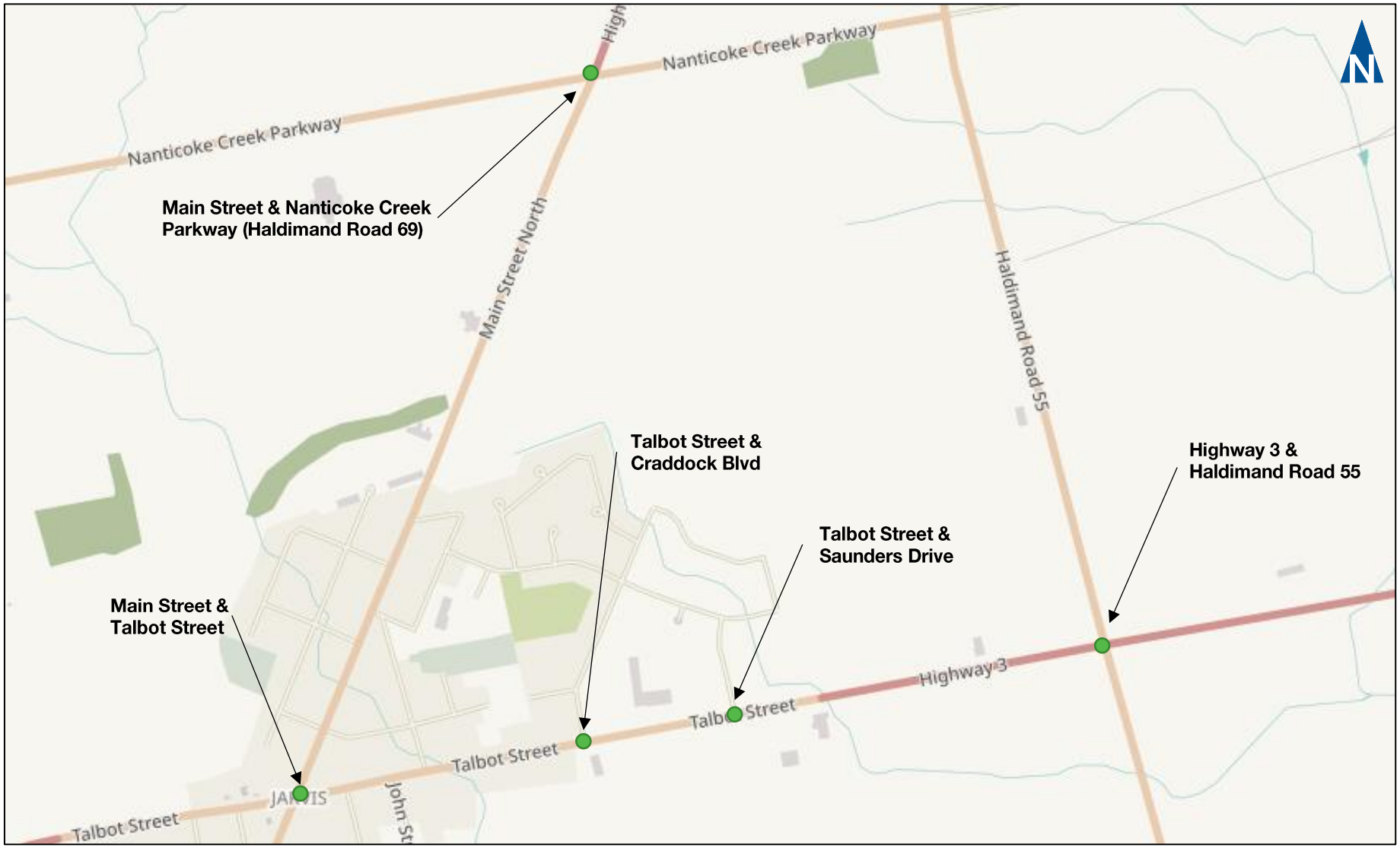
Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

Rajan Philips
M.A.Sc., P.Eng, FITE
Senior Transportation Consultant

Gene Chartier
M.A.Sc., P.Eng, FITE
Vice-President

Attachments



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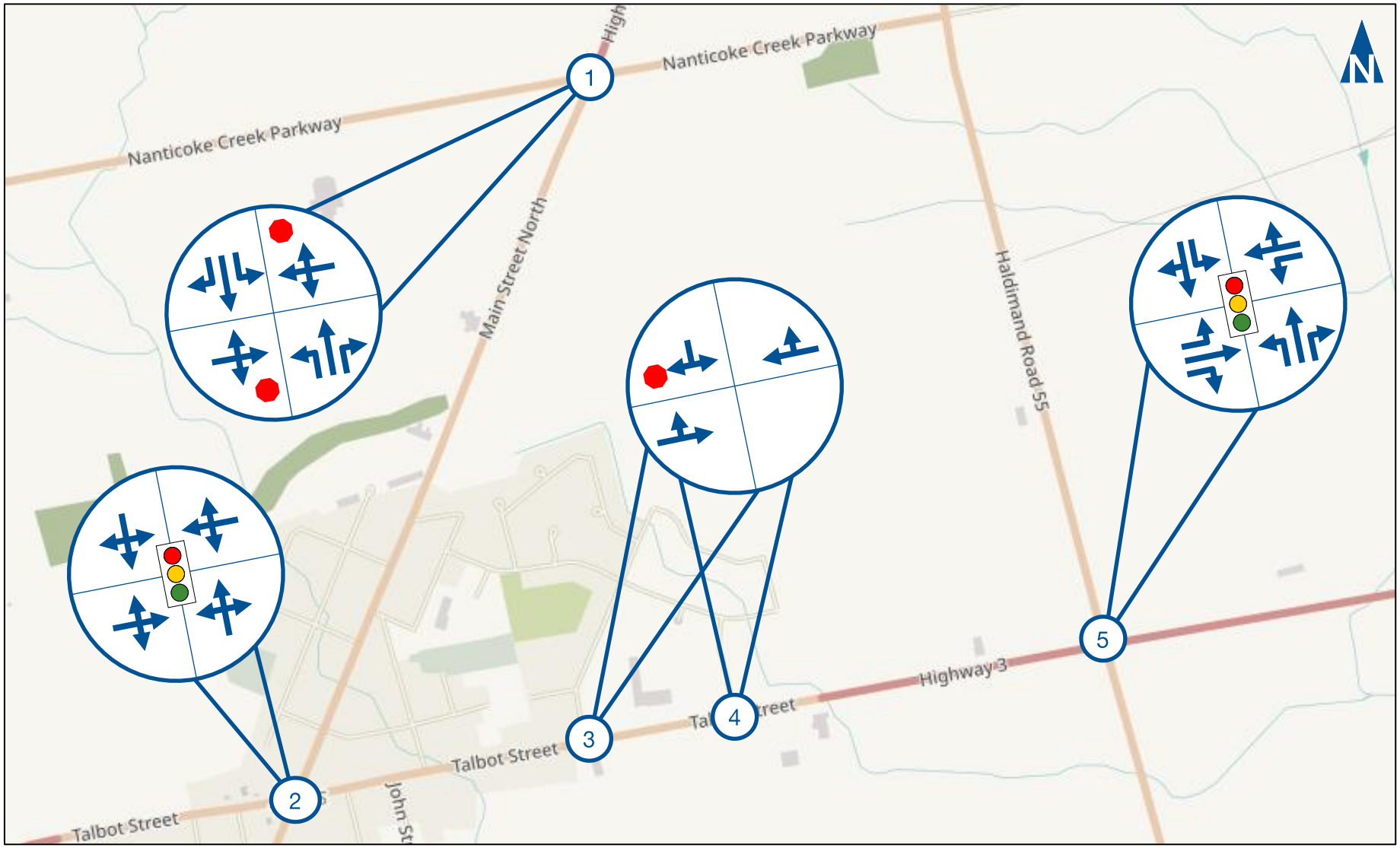
Study Area Intersections

Jarvis Master Service Plan
180197

Figure 1



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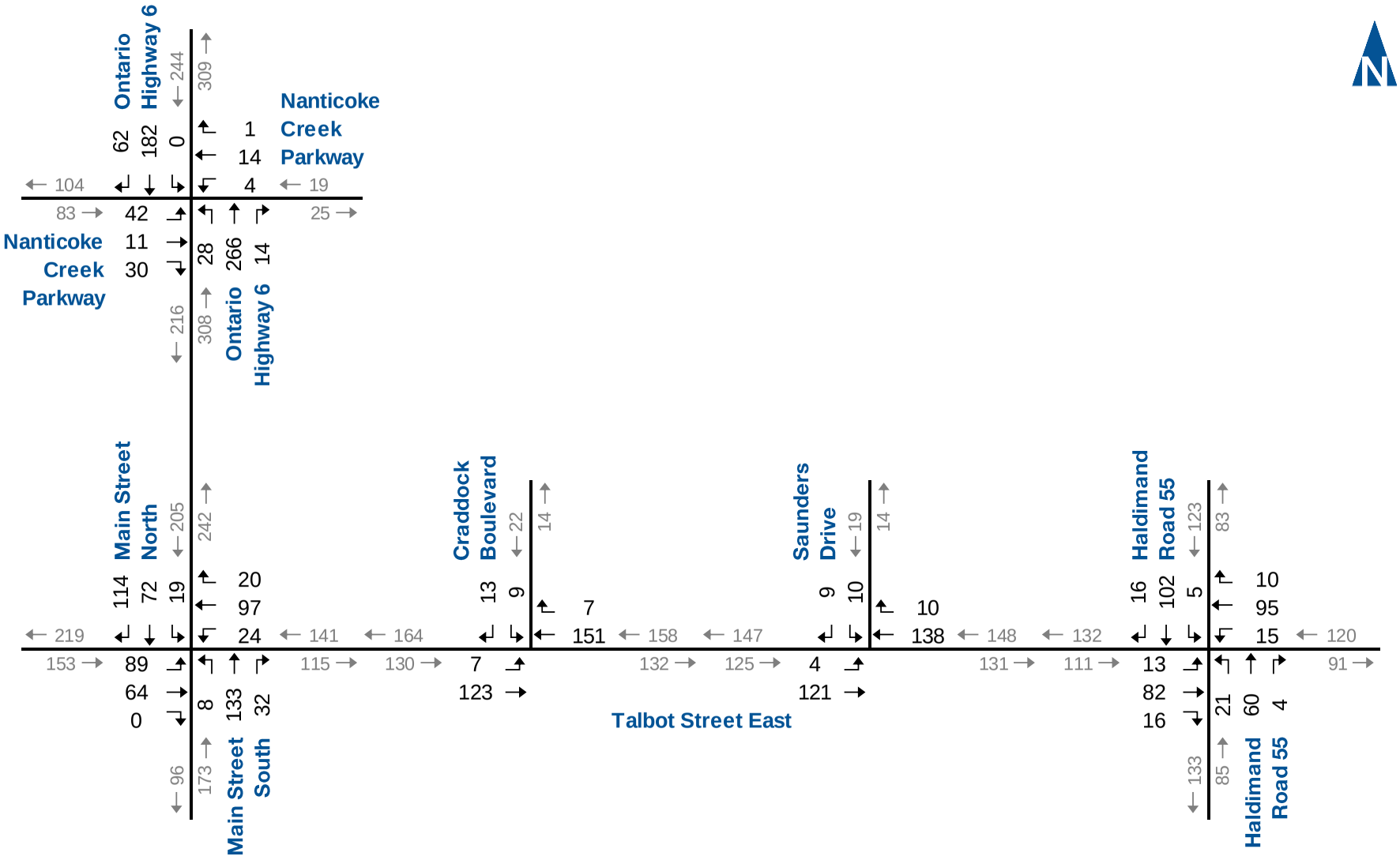
Existing Lane Configurations and Traffic Control

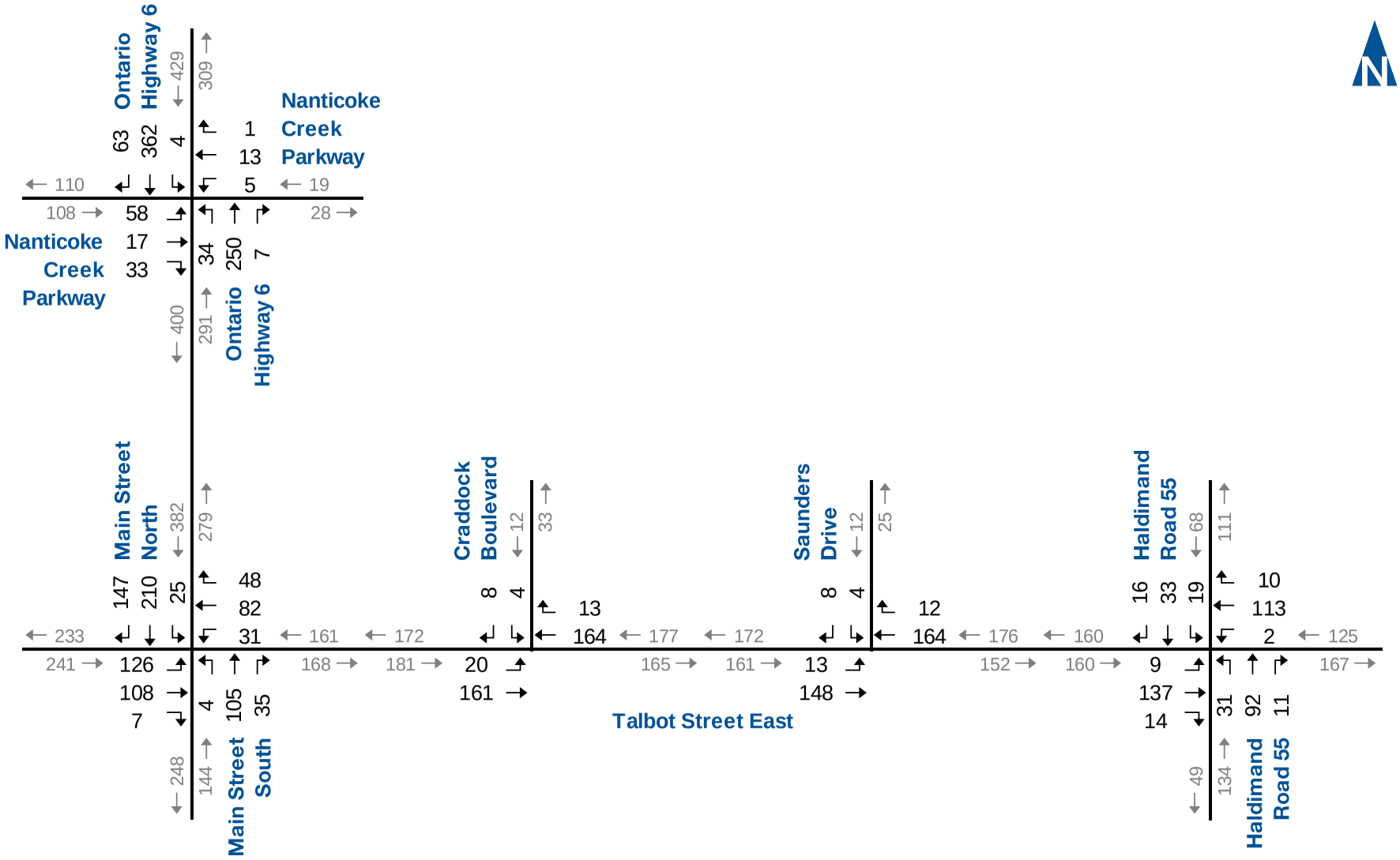
Jarvis Master Service Plan
180197

Figure 2



Existing Traffic Volumes
AM Peak Hour

Figure 3



Existing Traffic Volumes
PM Peak Hour

Figure 4

Appendix A

Existing Turning Movement Count Data and Signal Timings

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 1

Turning Movement Data

Start Time	Nanticoke Creek Pkwy Eastbound						Nanticoke Creek Pkwy Westbound						Highway 6 Northbound						Highway 6 Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	10	2	6	0	0	18	2	0	0	0	0	2	1	65	4	0	0	70	0	22	5	0	0	27	117
7:15 AM	9	2	6	0	0	17	3	0	1	0	0	4	4	68	3	0	0	75	0	26	7	0	0	33	129
7:30 AM	6	2	8	0	0	16	1	3	1	0	0	5	9	63	1	0	0	73	2	50	7	0	0	59	153
7:45 AM	17	0	7	0	0	24	1	4	0	0	0	5	11	83	2	0	0	96	0	46	12	0	0	58	183
Hourly Total	42	6	27	0	0	75	7	7	2	0	0	16	25	279	10	0	0	314	2	144	31	0	0	177	582
8:00 AM	4	5	6	0	0	15	1	1	0	0	0	2	6	61	6	0	0	73	0	52	13	0	0	65	155
8:15 AM	13	3	7	0	0	23	1	4	0	0	0	5	7	56	2	0	0	65	0	32	23	0	0	55	148
8:30 AM	8	3	10	0	0	21	1	5	1	0	0	7	4	55	4	0	0	63	0	52	14	0	0	66	157
8:45 AM	8	1	12	0	0	21	3	4	1	0	0	8	8	55	3	0	0	66	1	34	11	0	0	46	141
Hourly Total	33	12	35	0	0	80	6	14	2	0	0	22	25	227	15	0	0	267	1	170	61	0	0	232	601
9:00 AM	9	4	6	0	0	19	1	3	0	0	0	4	8	55	3	0	0	66	0	48	1	0	0	49	138
9:15 AM	7	2	6	0	0	15	0	1	0	0	0	1	3	54	4	0	0	61	0	44	7	0	0	51	128
9:30 AM	4	2	12	0	0	18	2	0	0	0	0	2	11	67	4	0	0	82	0	45	5	0	0	50	152
9:45 AM	2	0	7	0	0	9	3	2	0	0	0	5	5	37	4	0	0	46	0	46	15	0	0	61	121
Hourly Total	22	8	31	0	0	61	6	6	0	0	0	12	27	213	15	0	0	255	0	183	28	0	0	211	539
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
11:30 AM	7	1	8	0	0	16	0	2	0	0	0	2	3	50	1	0	0	54	0	45	12	0	0	57	129
11:45 AM	8	3	6	0	0	17	0	0	0	0	0	0	5	56	2	0	0	63	0	44	9	0	0	53	133
Hourly Total	15	4	14	0	0	33	0	2	0	0	0	2	8	106	3	0	0	117	0	89	21	0	0	110	262
12:00 PM	8	0	13	0	0	21	0	1	0	0	0	1	3	102	3	0	0	108	0	55	7	0	0	62	192
12:15 PM	6	1	8	0	0	15	0	3	0	0	0	3	11	40	0	0	0	51	1	52	7	0	0	60	129
12:30 PM	2	1	4	0	0	7	0	1	0	0	0	1	6	44	0	0	0	50	0	63	6	0	0	69	127
12:45 PM	10	3	4	0	0	17	0	0	0	0	0	0	6	62	3	0	0	71	0	74	8	0	0	82	170
Hourly Total	26	5	29	0	0	60	0	5	0	0	0	5	26	248	6	0	0	280	1	244	28	0	0	273	618
1:00 PM	13	1	4	0	0	18	2	1	0	0	0	3	3	63	2	0	0	68	0	53	7	0	0	60	149
1:15 PM	9	2	6	0	0	17	0	2	0	0	0	2	8	54	5	0	0	67	0	57	7	0	0	64	150
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	22	3	10	0	0	35	2	3	0	0	0	5	11	117	7	0	0	135	0	110	14	0	0	124	299
3:00 PM	11	3	5	0	0	19	0	1	1	0	0	2	4	59	1	0	0	64	1	57	4	0	0	62	147
3:15 PM	9	1	6	0	0	16	1	1	0	0	0	2	6	60	3	0	0	69	0	70	17	0	0	87	174
3:30 PM	8	3	2	0	0	13	1	1	0	0	0	2	6	66	1	0	0	73	0	67	4	0	0	71	159
3:45 PM	10	2	8	0	0	20	0	2	1	0	0	3	4	46	0	0	0	50	0	96	10	0	0	106	179
Hourly Total	38	9	21	0	0	68	2	5	2	0	0	9	20	231	5	0	0	256	1	290	35	0	0	326	659
4:00 PM	12	3	8	0	0	23	2	2	0	0	0	4	7	48	3	0	0	58	1	100	9	0	0	110	195
4:15 PM	17	4	8	0	0	29	1	1	0	0	0	2	6	57	2	0	0	65	0	77	15	0	0	92	188

4:30 PM	20	5	9	0	0	34	1	1	0	0	0	2	10	68	2	0	0	80	0	91	15	0	0	106	222
4:45 PM	13	8	6	0	0	27	2	3	0	0	3	5	10	62	4	0	3	76	1	111	10	0	0	122	230
Hourly Total	62	20	31	0	0	113	6	7	0	0	3	13	33	235	11	0	3	279	2	379	49	0	0	430	835
5:00 PM	14	3	10	0	0	27	2	3	1	0	0	6	6	55	1	0	0	62	1	77	18	0	0	96	191
5:15 PM	11	1	8	0	0	20	0	6	0	0	0	6	8	65	0	0	0	73	2	83	20	0	0	105	204
5:30 PM	5	3	7	0	0	15	0	1	0	0	0	1	9	41	3	0	0	53	1	82	13	0	0	96	165
5:45 PM	9	0	6	0	0	15	2	1	1	0	0	4	5	61	1	0	0	67	0	72	8	0	0	80	166
Hourly Total	39	7	31	0	0	77	4	11	2	0	0	17	28	222	5	0	0	255	4	314	59	0	0	377	726
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	299	74	229	0	0	602	33	60	8	0	3	101	204	1878	77	0	3	2159	11	1923	326	0	0	2260	5122
Approach %	49.7	12.3	38.0	0.0	-	-	32.7	59.4	7.9	0.0	-	-	9.4	87.0	3.6	0.0	-	-	0.5	85.1	14.4	0.0	-	-	-
Total %	5.8	1.4	4.5	0.0	-	11.8	0.6	1.2	0.2	0.0	-	2.0	4.0	36.7	1.5	0.0	-	42.2	0.2	37.5	6.4	0.0	-	44.1	-
Lights	285	66	221	0	-	572	32	54	4	0	-	90	198	1785	74	0	-	2057	5	1826	314	0	-	2145	4864
% Lights	95.3	89.2	96.5	-	-	95.0	97.0	90.0	50.0	-	-	89.1	97.1	95.0	96.1	-	-	95.3	45.5	95.0	96.3	-	-	94.9	95.0
Mediums	13	7	7	0	-	27	1	5	4	0	-	10	6	57	2	0	-	65	5	56	10	0	-	71	173
% Mediums	4.3	9.5	3.1	-	-	4.5	3.0	8.3	50.0	-	-	9.9	2.9	3.0	2.6	-	-	3.0	45.5	2.9	3.1	-	-	3.1	3.4
Articulated Trucks	1	1	1	0	-	3	0	1	0	0	-	1	0	36	1	0	-	37	1	41	2	0	-	44	85
% Articulated Trucks	0.3	1.4	0.4	-	-	0.5	0.0	1.7	0.0	-	-	1.0	0.0	1.9	1.3	-	-	1.7	9.1	2.1	0.6	-	-	1.9	1.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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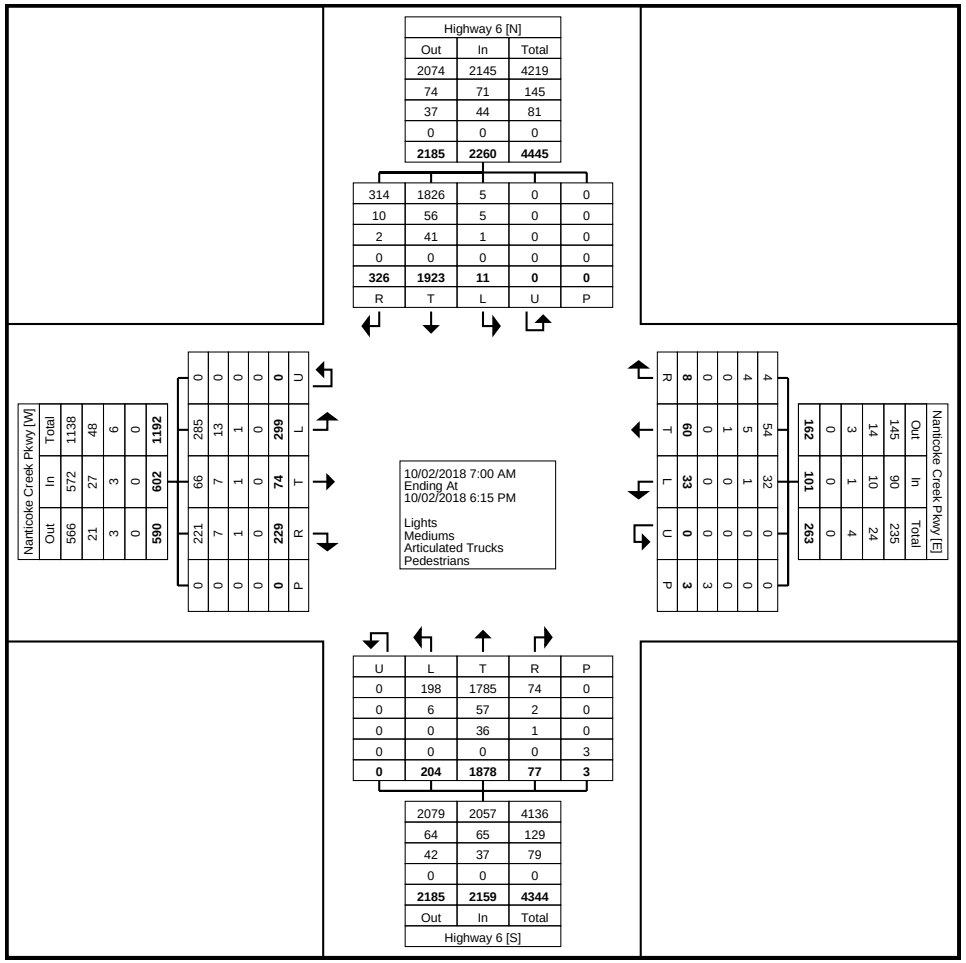
Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Nanticoke Creek Pkwy Eastbound						Nanticoke Creek Pkwy Westbound						Highway 6 Northbound						Highway 6 Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	17	0	7	0	0	24	1	4	0	0	0	5	11	83	2	0	0	96	0	46	12	0	0	58	183
8:00 AM	4	5	6	0	0	15	1	1	0	0	0	2	6	61	6	0	0	73	0	52	13	0	0	65	155
8:15 AM	13	3	7	0	0	23	1	4	0	0	0	5	7	56	2	0	0	65	0	32	23	0	0	55	148
8:30 AM	8	3	10	0	0	21	1	5	1	0	0	7	4	55	4	0	0	63	0	52	14	0	0	66	157
Total	42	11	30	0	0	83	4	14	1	0	0	19	28	255	14	0	0	297	0	182	62	0	0	244	643
Approach %	50.6	13.3	36.1	0.0	-	-	21.1	73.7	5.3	0.0	-	-	9.4	85.9	4.7	0.0	-	-	0.0	74.6	25.4	0.0	-	-	-
Total %	6.5	1.7	4.7	0.0	-	12.9	0.6	2.2	0.2	0.0	-	3.0	4.4	39.7	2.2	0.0	-	46.2	0.0	28.3	9.6	0.0	-	37.9	-
PHF	0.618	0.550	0.750	0.000	-	0.865	1.000	0.700	0.250	0.000	-	0.679	0.636	0.768	0.583	0.000	-	0.773	0.000	0.875	0.674	0.000	-	0.924	0.878
Lights	39	8	28	0	-	75	4	12	1	0	-	17	25	247	13	0	-	285	0	171	58	0	-	229	606
% Lights	92.9	72.7	93.3	-	-	90.4	100.0	85.7	100.0	-	-	89.5	89.3	96.9	92.9	-	-	96.0	-	94.0	93.5	-	-	93.9	94.2
Mediums	3	3	1	0	-	7	0	2	0	0	-	2	3	3	1	0	-	7	0	7	3	0	-	10	26
% Mediums	7.1	27.3	3.3	-	-	8.4	0.0	14.3	0.0	-	-	10.5	10.7	1.2	7.1	-	-	2.4	-	3.8	4.8	-	-	4.1	4.0
Articulated Trucks	0	0	1	0	-	1	0	0	0	0	-	0	0	5	0	0	-	5	0	4	1	0	-	5	11
% Articulated Trucks	0.0	0.0	3.3	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.0	2.0	0.0	-	-	1.7	-	2.2	1.6	-	-	2.0	1.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
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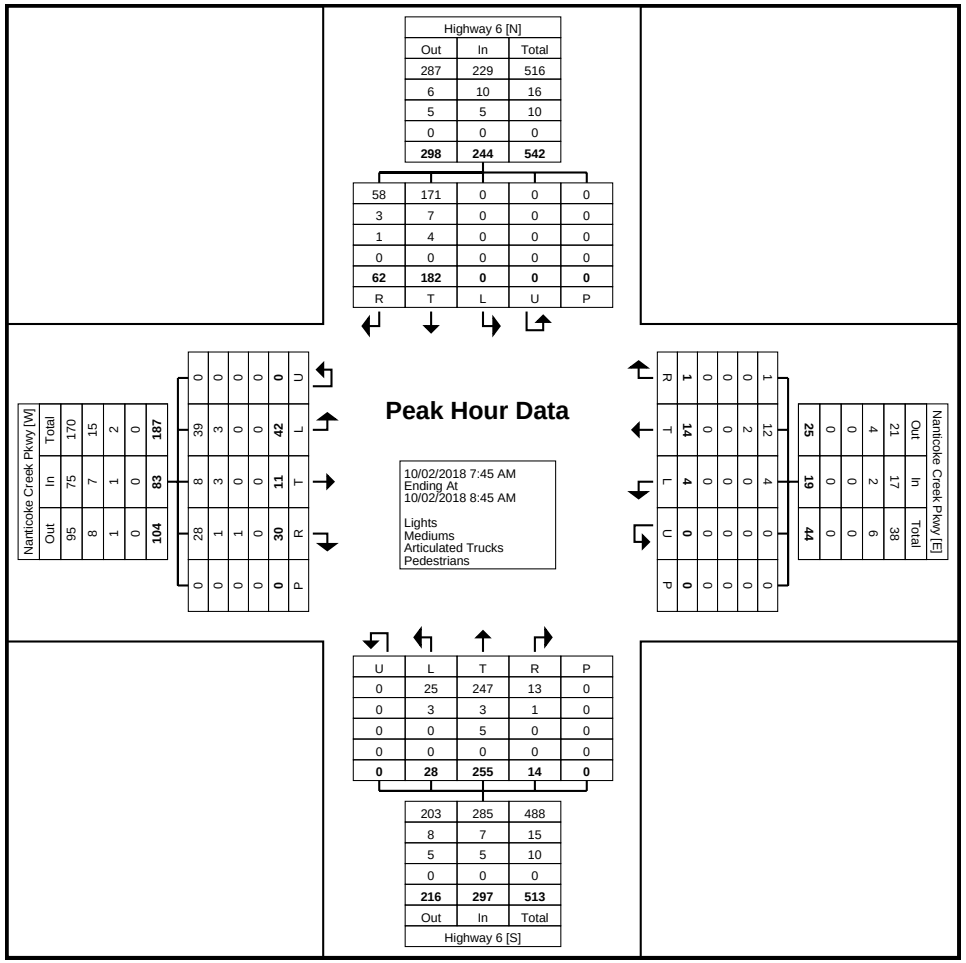
Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 5



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 6

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Nanticoke Creek Pkwy Eastbound						Nanticoke Creek Pkwy Westbound						Highway 6 Northbound						Highway 6 Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	8	0	13	0	0	21	0	1	0	0	0	1	3	102	3	0	0	108	0	55	7	0	0	62	192
12:15 PM	6	1	8	0	0	15	0	3	0	0	0	3	11	40	0	0	0	51	1	52	7	0	0	60	129
12:30 PM	2	1	4	0	0	7	0	1	0	0	0	1	6	44	0	0	0	50	0	63	6	0	0	69	127
12:45 PM	10	3	4	0	0	17	0	0	0	0	0	0	6	62	3	0	0	71	0	74	8	0	0	82	170
Total	26	5	29	0	0	60	0	5	0	0	0	5	26	248	6	0	0	280	1	244	28	0	0	273	618
Approach %	43.3	8.3	48.3	0.0	-	-	0.0	100.0	0.0	0.0	-	-	9.3	88.6	2.1	0.0	-	-	0.4	89.4	10.3	0.0	-	-	-
Total %	4.2	0.8	4.7	0.0	-	9.7	0.0	0.8	0.0	0.0	-	0.8	4.2	40.1	1.0	0.0	-	45.3	0.2	39.5	4.5	0.0	-	44.2	-
PHF	0.650	0.417	0.558	0.000	-	0.714	0.000	0.417	0.000	0.000	-	0.417	0.591	0.608	0.500	0.000	-	0.648	0.250	0.824	0.875	0.000	-	0.832	0.805
Lights	25	3	28	0	-	56	0	3	0	0	-	3	26	238	6	0	-	270	0	233	28	0	-	261	590
% Lights	96.2	60.0	96.6	-	-	93.3	-	60.0	-	-	-	60.0	100.0	96.0	100.0	-	-	96.4	0.0	95.5	100.0	-	-	95.6	95.5
Mediums	1	1	1	0	-	3	0	1	0	0	-	1	0	5	0	0	-	5	1	6	0	0	-	7	16
% Mediums	3.8	20.0	3.4	-	-	5.0	-	20.0	-	-	-	20.0	0.0	2.0	0.0	-	-	1.8	100.0	2.5	0.0	-	-	2.6	2.6
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	5	0	0	-	5	0	5	0	0	-	5	12
% Articulated Trucks	0.0	20.0	0.0	-	-	1.7	-	20.0	-	-	-	20.0	0.0	2.0	0.0	-	-	1.8	0.0	2.0	0.0	-	-	1.8	1.9
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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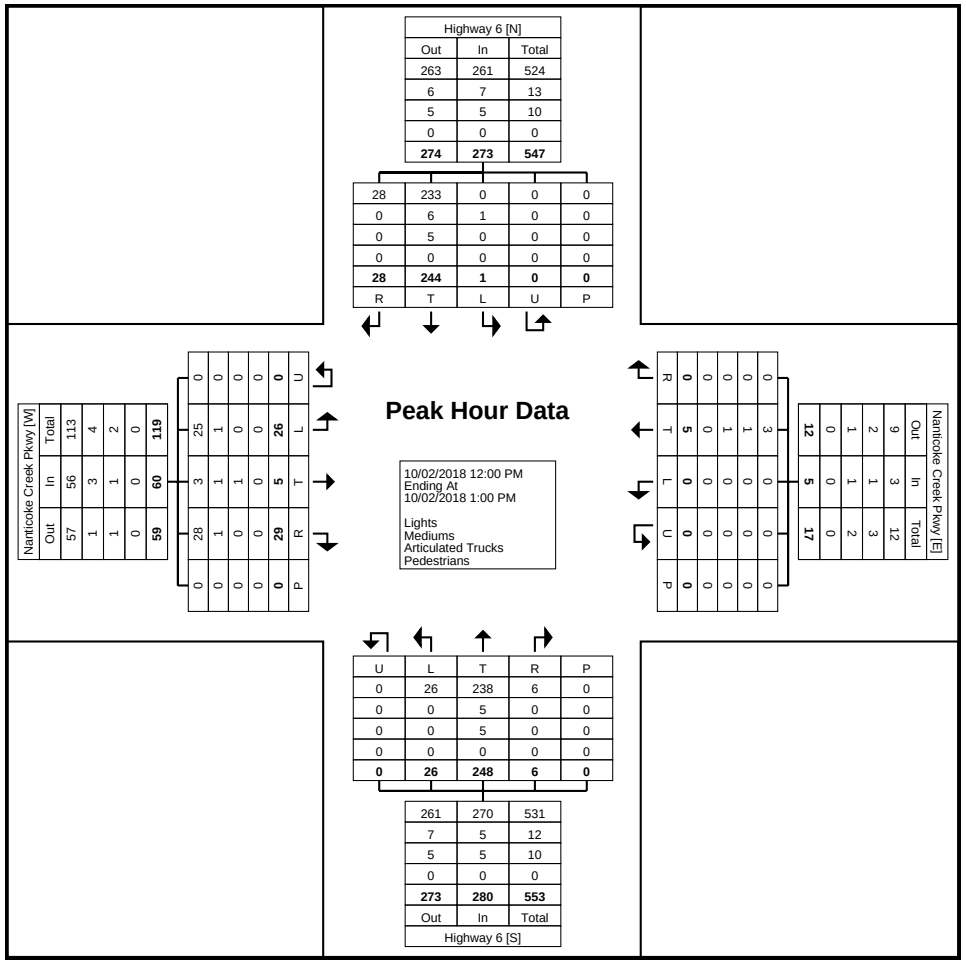
Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 7



Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
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Start Date: 10/02/2018
Page No: 8

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Nanticoke Creek Pkwy Eastbound						Nanticoke Creek Pkwy Westbound						Highway 6 Northbound						Highway 6 Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	20	5	9	0	0	34	1	1	0	0	0	2	10	68	2	0	0	80	0	91	15	0	0	106	222
4:45 PM	13	8	6	0	0	27	2	3	0	0	3	5	10	62	4	0	3	76	1	111	10	0	0	122	230
5:00 PM	14	3	10	0	0	27	2	3	1	0	0	6	6	55	1	0	0	62	1	77	18	0	0	96	191
5:15 PM	11	1	8	0	0	20	0	6	0	0	0	6	8	65	0	0	0	73	2	83	20	0	0	105	204
Total	58	17	33	0	0	108	5	13	1	0	3	19	34	250	7	0	3	291	4	362	63	0	0	429	847
Approach %	53.7	15.7	30.6	0.0	-	-	26.3	68.4	5.3	0.0	-	-	11.7	85.9	2.4	0.0	-	-	0.9	84.4	14.7	0.0	-	-	-
Total %	6.8	2.0	3.9	0.0	-	12.8	0.6	1.5	0.1	0.0	-	2.2	4.0	29.5	0.8	0.0	-	34.4	0.5	42.7	7.4	0.0	-	50.6	-
PHF	0.725	0.531	0.825	0.000	-	0.794	0.625	0.542	0.250	0.000	-	0.792	0.850	0.919	0.438	0.000	-	0.909	0.500	0.815	0.788	0.000	-	0.879	0.921
Lights	57	16	32	0	-	105	5	13	0	0	-	18	33	238	6	0	-	277	1	354	63	0	-	418	818
% Lights	98.3	94.1	97.0	-	-	97.2	100.0	100.0	0.0	-	-	94.7	97.1	95.2	85.7	-	-	95.2	25.0	97.8	100.0	-	-	97.4	96.6
Mediums	1	1	1	0	-	3	0	0	1	0	-	1	1	6	0	0	-	7	2	5	0	0	-	7	18
% Mediums	1.7	5.9	3.0	-	-	2.8	0.0	0.0	100.0	-	-	5.3	2.9	2.4	0.0	-	-	2.4	50.0	1.4	0.0	-	-	1.6	2.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	6	1	0	-	7	1	3	0	0	-	4	11
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.4	14.3	-	-	2.4	25.0	0.8	0.0	-	-	0.9	1.3
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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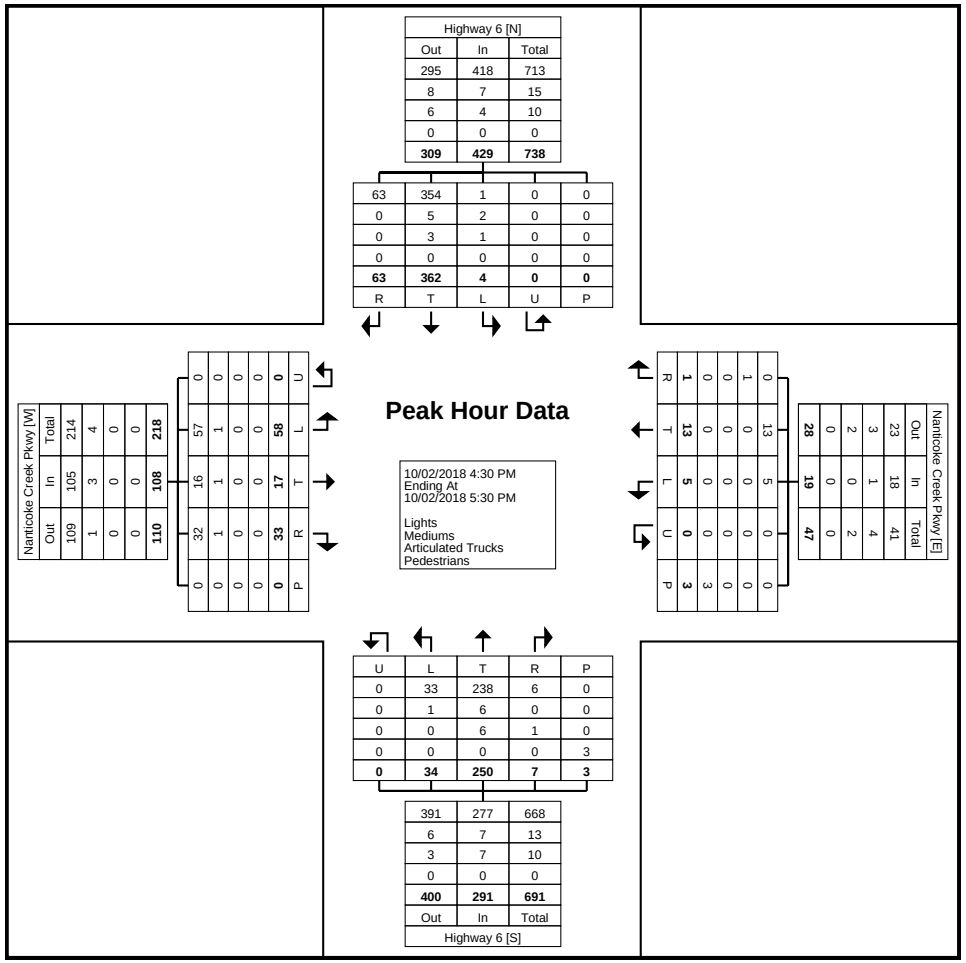
Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 9



Turning Movement Peak Hour Data Plot (4:30 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Highway 6 (Main Street) & Nanticoke Creek Pkwy
Site Code:
Start Date: 10/02/2018
Page No: 10

Paradigm Transportation Solutions Limited
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519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 1

Turning Movement Data

Start Time	Talbot Street Eastbound						Talbot Street Westbound						Main Street Northbound						Main Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	20	11	0	0	0	31	1	6	4	0	0	11	1	37	8	0	0	46	4	6	15	0	0	25	113
7:15 AM	25	13	1	0	0	39	1	15	7	0	0	23	1	25	17	0	0	43	3	10	23	0	0	36	141
7:30 AM	23	17	1	0	0	41	0	24	2	0	1	26	0	35	10	0	0	45	7	8	32	0	0	47	159
7:45 AM	22	22	0	0	0	44	10	27	7	0	1	44	3	45	6	0	0	54	4	12	30	0	0	46	188
Hourly Total	90	63	2	0	0	155	12	72	20	0	2	104	5	142	41	0	0	188	18	36	100	0	0	154	601
8:00 AM	24	13	0	0	1	37	3	16	6	0	0	25	3	29	7	0	0	39	6	21	32	0	0	59	160
8:15 AM	23	17	0	0	1	40	7	21	4	0	0	32	2	28	9	0	0	39	4	14	25	0	0	43	154
8:30 AM	20	12	0	0	0	32	4	33	3	0	0	40	0	31	10	0	0	41	5	25	27	0	0	57	170
8:45 AM	16	14	3	0	0	33	2	14	7	0	0	23	3	39	5	0	0	47	8	15	21	0	0	44	147
Hourly Total	83	56	3	0	2	142	16	84	20	0	0	120	8	127	31	0	0	166	23	75	105	0	0	203	631
9:00 AM	26	19	1	0	0	46	12	29	12	0	2	53	1	32	5	0	0	38	7	13	22	0	4	42	179
9:15 AM	15	19	1	0	0	35	7	25	10	0	0	42	1	26	3	0	0	30	5	15	26	0	2	46	153
9:30 AM	27	18	0	0	0	45	4	20	13	0	0	37	3	38	5	0	1	46	6	21	21	0	0	48	176
9:45 AM	15	14	2	0	0	31	8	29	5	0	4	42	1	15	4	0	0	20	6	22	20	0	0	48	141
Hourly Total	83	70	4	0	0	157	31	103	40	0	6	174	6	111	17	0	1	134	24	71	89	0	6	184	649
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	29	19	2	0	0	50	5	28	11	0	0	44	3	18	5	0	0	26	10	22	15	0	0	47	167
11:45 AM	54	17	0	0	1	71	3	20	6	0	0	29	4	31	7	0	0	42	5	23	18	0	0	46	188
Hourly Total	83	36	2	0	1	121	8	48	17	0	0	73	7	49	12	0	0	68	15	45	33	0	0	93	355
12:00 PM	45	19	1	0	0	65	5	27	13	0	0	45	3	29	7	0	0	39	12	21	22	0	1	55	204
12:15 PM	17	27	2	0	0	46	5	26	8	0	1	39	3	25	9	0	0	37	10	26	19	0	1	55	177
12:30 PM	9	19	1	0	0	29	7	22	8	0	0	37	4	33	8	0	0	45	8	31	17	0	0	56	167
12:45 PM	26	20	1	0	1	47	6	25	13	0	0	44	3	30	2	0	0	35	11	31	31	0	0	73	199
Hourly Total	97	85	5	0	1	187	23	100	42	0	1	165	13	117	26	0	0	156	41	109	89	0	2	239	747
1:00 PM	21	26	3	0	0	50	2	28	8	0	3	38	2	38	8	0	1	48	6	22	29	0	0	57	193
1:15 PM	25	18	1	0	1	44	1	22	10	0	2	33	5	32	7	0	0	44	13	26	26	0	0	65	186
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	46	44	4	0	1	94	3	50	18	0	5	71	7	70	15	0	1	92	19	48	55	0	0	122	379
3:00 PM	26	34	1	0	0	61	8	21	12	0	10	41	2	35	8	0	0	45	8	37	20	0	1	65	212
3:15 PM	24	30	3	0	2	57	13	23	11	0	12	47	1	19	6	0	2	26	4	35	32	0	2	71	201
3:30 PM	30	18	1	0	2	49	8	22	8	0	3	38	3	29	6	0	0	38	7	28	33	0	5	68	193
3:45 PM	30	35	3	0	1	68	5	13	8	0	1	26	1	22	5	0	0	28	5	42	39	0	3	86	208
Hourly Total	110	117	8	0	5	235	34	79	39	0	26	152	7	105	25	0	2	137	24	142	124	0	11	290	814
4:00 PM	27	17	4	0	6	48	8	24	8	0	3	40	0	28	5	0	0	33	3	59	36	0	4	98	219

4:15 PM	25	29	2	0	0	56	8	18	11	0	0	37	0	30	7	0	0	37	7	42	39	0	0	88	218
4:30 PM	31	31	1	0	0	63	7	20	14	0	2	41	3	22	8	0	0	33	6	57	31	0	0	94	231
4:45 PM	43	31	0	0	0	74	8	20	15	0	0	43	1	25	15	0	0	41	9	52	41	0	0	102	260
Hourly Total	126	108	7	0	6	241	31	82	48	0	5	161	4	105	35	0	0	144	25	210	147	0	4	382	928
5:00 PM	28	21	1	0	0	50	8	18	18	0	0	44	1	20	2	0	0	23	11	49	34	0	1	94	211
5:15 PM	39	22	0	0	0	61	7	34	10	0	0	51	0	29	7	0	0	36	6	36	33	0	0	75	223
5:30 PM	16	29	1	0	3	46	8	26	11	0	1	45	1	22	7	0	1	30	4	42	23	0	2	69	190
5:45 PM	30	24	3	0	1	57	9	27	7	0	0	43	1	19	3	0	1	23	4	38	23	0	0	65	188
Hourly Total	113	96	5	0	4	214	32	105	46	0	1	183	3	90	19	0	2	112	25	165	113	0	3	303	812
6:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	831	676	40	0	20	1547	190	723	290	0	46	1203	60	916	221	0	6	1197	214	901	855	0	26	1970	5917
Approach %	53.7	43.7	2.6	0.0	-	-	15.8	60.1	24.1	0.0	-	-	5.0	76.5	18.5	0.0	-	-	10.9	45.7	43.4	0.0	-	-	-
Total %	14.0	11.4	0.7	0.0	-	26.1	3.2	12.2	4.9	0.0	-	20.3	1.0	15.5	3.7	0.0	-	20.2	3.6	15.2	14.4	0.0	-	33.3	-
Lights	792	617	38	0	-	1447	181	667	279	0	-	1127	53	868	214	0	-	1135	205	859	810	0	-	1874	5583
% Lights	95.3	91.3	95.0	-	-	93.5	95.3	92.3	96.2	-	-	93.7	88.3	94.8	96.8	-	-	94.8	95.8	95.3	94.7	-	-	95.1	94.4
Mediums	24	25	1	0	-	50	9	24	8	0	-	41	4	32	5	0	-	41	5	27	26	0	-	58	190
% Mediums	2.9	3.7	2.5	-	-	3.2	4.7	3.3	2.8	-	-	3.4	6.7	3.5	2.3	-	-	3.4	2.3	3.0	3.0	-	-	2.9	3.2
Articulated Trucks	15	34	1	0	-	50	0	32	3	0	-	35	3	16	2	0	-	21	4	15	19	0	-	38	144
% Articulated Trucks	1.8	5.0	2.5	-	-	3.2	0.0	4.4	1.0	-	-	2.9	5.0	1.7	0.9	-	-	1.8	1.9	1.7	2.2	-	-	1.9	2.4
Pedestrians	-	-	-	-	20	-	-	-	-	-	46	-	-	-	-	-	6	-	-	-	-	-	26	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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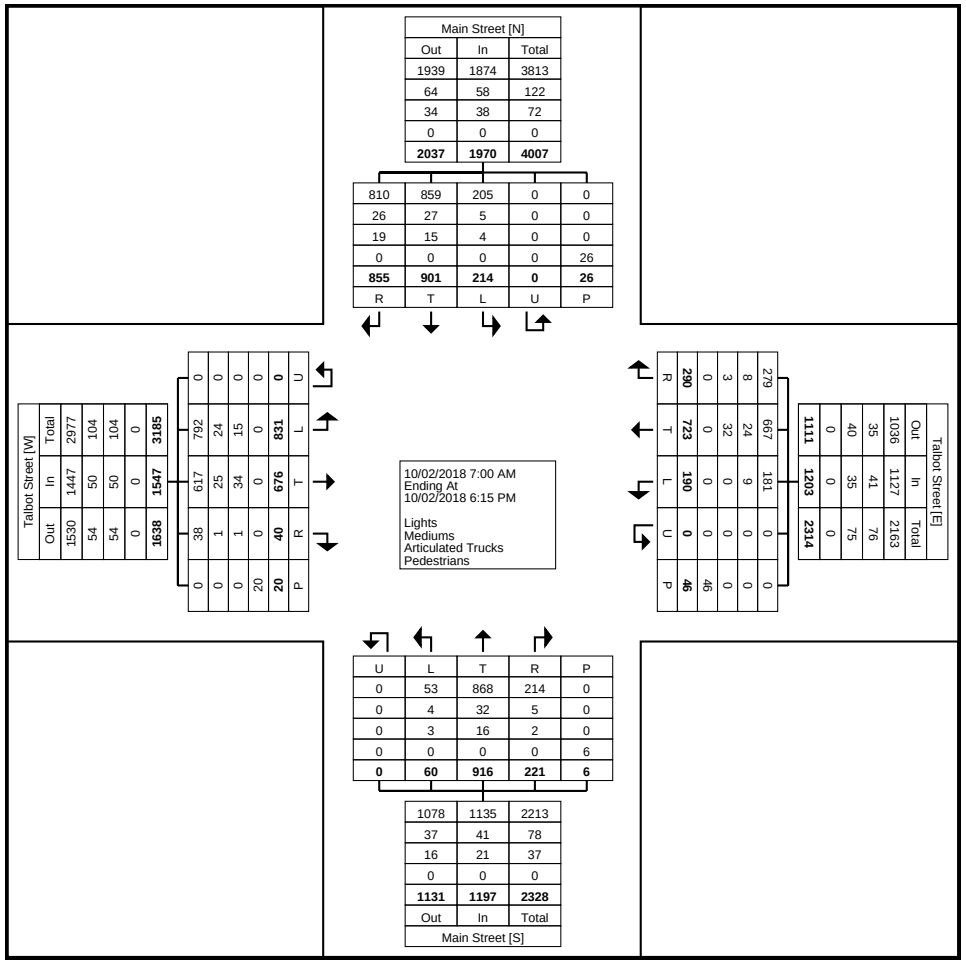
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Talbot Street Eastbound						Talbot Street Westbound						Main Street Northbound						Main Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	22	22	0	0	0	44	10	27	7	0	1	44	3	45	6	0	0	54	4	12	30	0	0	46	188
8:00 AM	24	13	0	0	1	37	3	16	6	0	0	25	3	29	7	0	0	39	6	21	32	0	0	59	160
8:15 AM	23	17	0	0	1	40	7	21	4	0	0	32	2	28	9	0	0	39	4	14	25	0	0	43	154
8:30 AM	20	12	0	0	0	32	4	33	3	0	0	40	0	31	10	0	0	41	5	25	27	0	0	57	170
Total	89	64	0	0	2	153	24	97	20	0	1	141	8	133	32	0	0	173	19	72	114	0	0	205	672
Approach %	58.2	41.8	0.0	0.0	-	-	17.0	68.8	14.2	0.0	-	-	4.6	76.9	18.5	0.0	-	-	9.3	35.1	55.6	0.0	-	-	-
Total %	13.2	9.5	0.0	0.0	-	22.8	3.6	14.4	3.0	0.0	-	21.0	1.2	19.8	4.8	0.0	-	25.7	2.8	10.7	17.0	0.0	-	30.5	-
PHF	0.927	0.727	0.000	0.000	-	0.869	0.600	0.735	0.714	0.000	-	0.801	0.667	0.739	0.800	0.000	-	0.801	0.792	0.720	0.891	0.000	-	0.869	0.894
Lights	84	57	0	0	-	141	23	90	19	0	-	132	8	128	31	0	-	167	18	69	108	0	-	195	635
% Lights	94.4	89.1	-	-	-	92.2	95.8	92.8	95.0	-	-	93.6	100.0	96.2	96.9	-	-	96.5	94.7	95.8	94.7	-	-	95.1	94.5
Mediums	3	5	0	0	-	8	1	2	1	0	-	4	0	5	1	0	-	6	1	2	4	0	-	7	25
% Mediums	3.4	7.8	-	-	-	5.2	4.2	2.1	5.0	-	-	2.8	0.0	3.8	3.1	-	-	3.5	5.3	2.8	3.5	-	-	3.4	3.7
Articulated Trucks	2	2	0	0	-	4	0	5	0	0	-	5	0	0	0	0	-	0	0	1	2	0	-	3	12
% Articulated Trucks	2.2	3.1	-	-	-	2.6	0.0	5.2	0.0	-	-	3.5	0.0	0.0	0.0	-	-	0.0	0.0	1.4	1.8	-	-	1.5	1.8
Pedestrians	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

paradigm

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Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 5

Peak Hour Data

10/02/2018 7:45 AM
Ending At
10/02/2018 8:45 AM

Lights
Mediums
Articulated Trucks
Pedestrians

Main Street [N]

Out	In	Total
231	195	426
9	7	16
2	3	5
0	0	0
242	**205**	**447**

R	T	L	U	P
108	69	18	0	0
4	2	1	0	0
2	1	0	0	0
0	0	0	0	0
114	**72**	**19**	**0**	**0**

Talbot Street [W]

Out	In	Total
206	141	347
6	8	14
7	4	11
0	0	0
219	**153**	**372**

U	L	T	R	P
0	84	57	0	0
0	3	5	0	0
0	2	2	0	0
0	0	0	0	2
0	**89**	**64**	**0**	**2**

Talbot Street [E]

Out	In	Total
106	132	238
7	4	11
2	5	7
0	0	0
115	**141**	**256**

R	T	L	U	P
19	90	23	0	0
1	2	1	0	0
0	5	0	0	0
0	0	0	0	1
20	**97**	**24**	**0**	**1**

Main Street [S]

U	L	T	R	P
0	8	128	31	0
0	0	5	1	0
0	0	0	0	0
0	0	0	0	0
0	**8**	**133**	**32**	**0**

Out	In	Total
92	167	259
3	6	9
1	0	1
0	0	0
96	**173**	**269**

Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 6

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Talbot Street Eastbound						Talbot Street Westbound						Main Street Northbound						Main Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	45	19	1	0	0	65	5	27	13	0	0	45	3	29	7	0	0	39	12	21	22	0	1	55	204
12:15 PM	17	27	2	0	0	46	5	26	8	0	1	39	3	25	9	0	0	37	10	26	19	0	1	55	177
12:30 PM	9	19	1	0	0	29	7	22	8	0	0	37	4	33	8	0	0	45	8	31	17	0	0	56	167
12:45 PM	26	20	1	0	1	47	6	25	13	0	0	44	3	30	2	0	0	35	11	31	31	0	0	73	199
Total	97	85	5	0	1	187	23	100	42	0	1	165	13	117	26	0	0	156	41	109	89	0	2	239	747
Approach %	51.9	45.5	2.7	0.0	-	-	13.9	60.6	25.5	0.0	-	-	8.3	75.0	16.7	0.0	-	-	17.2	45.6	37.2	0.0	-	-	-
Total %	13.0	11.4	0.7	0.0	-	25.0	3.1	13.4	5.6	0.0	-	22.1	1.7	15.7	3.5	0.0	-	20.9	5.5	14.6	11.9	0.0	-	32.0	-
PHF	0.539	0.787	0.625	0.000	-	0.719	0.821	0.926	0.808	0.000	-	0.917	0.813	0.886	0.722	0.000	-	0.867	0.854	0.879	0.718	0.000	-	0.818	0.915
Lights	97	80	4	0	-	181	21	91	40	0	-	152	12	110	25	0	-	147	40	101	86	0	-	227	707
% Lights	100.0	94.1	80.0	-	-	96.8	91.3	91.0	95.2	-	-	92.1	92.3	94.0	96.2	-	-	94.2	97.6	92.7	96.6	-	-	95.0	94.6
Mediums	0	1	0	0	-	1	2	4	1	0	-	7	1	3	0	0	-	4	1	7	1	0	-	9	21
% Mediums	0.0	1.2	0.0	-	-	0.5	8.7	4.0	2.4	-	-	4.2	7.7	2.6	0.0	-	-	2.6	2.4	6.4	1.1	-	-	3.8	2.8
Articulated Trucks	0	4	1	0	-	5	0	5	1	0	-	6	0	4	1	0	-	5	0	1	2	0	-	3	19
% Articulated Trucks	0.0	4.7	20.0	-	-	2.7	0.0	5.0	2.4	-	-	3.6	0.0	3.4	3.8	-	-	3.2	0.0	0.9	2.2	-	-	1.3	2.5
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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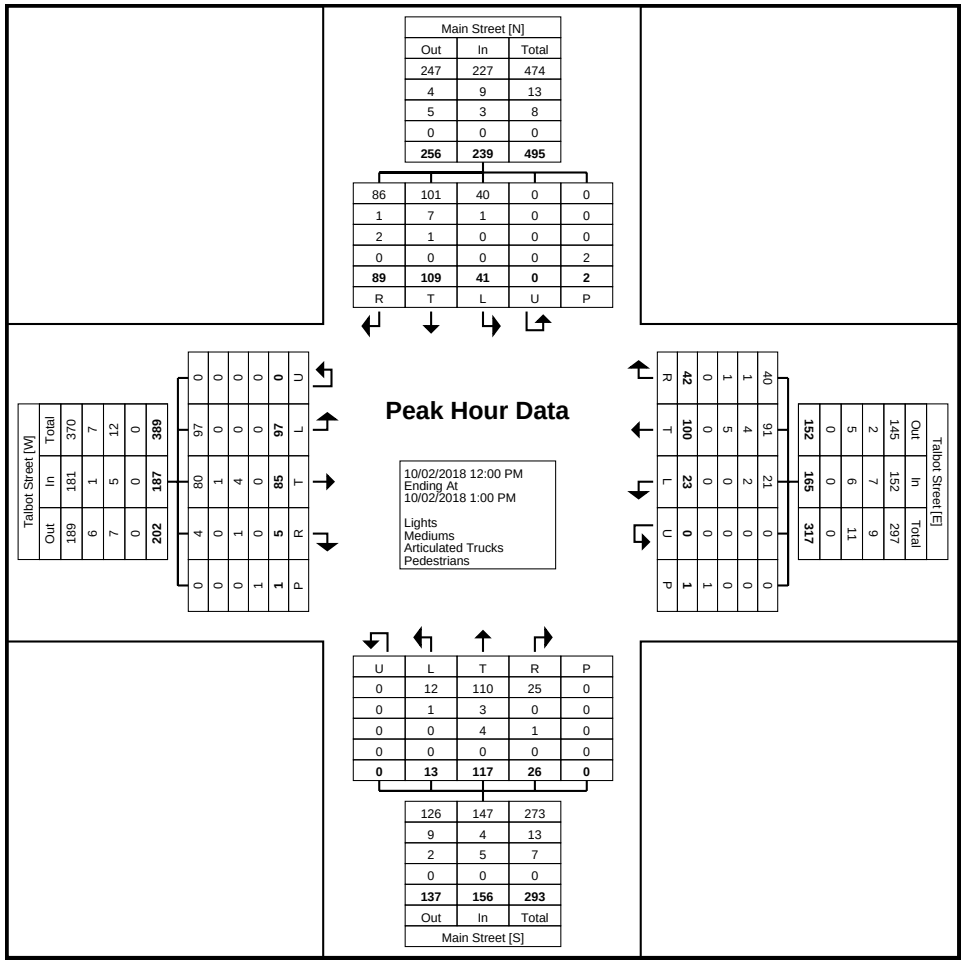
Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 7



Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 8

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Talbot Street Eastbound						Talbot Street Westbound						Main Street Northbound						Main Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	27	17	4	0	6	48	8	24	8	0	3	40	0	28	5	0	0	33	3	59	36	0	4	98	219
4:15 PM	25	29	2	0	0	56	8	18	11	0	0	37	0	30	7	0	0	37	7	42	39	0	0	88	218
4:30 PM	31	31	1	0	0	63	7	20	14	0	2	41	3	22	8	0	0	33	6	57	31	0	0	94	231
4:45 PM	43	31	0	0	0	74	8	20	15	0	0	43	1	25	15	0	0	41	9	52	41	0	0	102	260
Total	126	108	7	0	6	241	31	82	48	0	5	161	4	105	35	0	0	144	25	210	147	0	4	382	928
Approach %	52.3	44.8	2.9	0.0	-	-	19.3	50.9	29.8	0.0	-	-	2.8	72.9	24.3	0.0	-	-	6.5	55.0	38.5	0.0	-	-	-
Total %	13.6	11.6	0.8	0.0	-	26.0	3.3	8.8	5.2	0.0	-	17.3	0.4	11.3	3.8	0.0	-	15.5	2.7	22.6	15.8	0.0	-	41.2	-
PHF	0.733	0.871	0.438	0.000	-	0.814	0.969	0.854	0.800	0.000	-	0.936	0.333	0.875	0.583	0.000	-	0.878	0.694	0.890	0.896	0.000	-	0.936	0.892
Lights	122	99	7	0	-	228	31	79	46	0	-	156	4	102	33	0	-	139	23	204	146	0	-	373	896
% Lights	96.8	91.7	100.0	-	-	94.6	100.0	96.3	95.8	-	-	96.9	100.0	97.1	94.3	-	-	96.5	92.0	97.1	99.3	-	-	97.6	96.6
Mediums	1	2	0	0	-	3	0	2	2	0	-	4	0	1	1	0	-	2	1	4	0	0	-	5	14
% Mediums	0.8	1.9	0.0	-	-	1.2	0.0	2.4	4.2	-	-	2.5	0.0	1.0	2.9	-	-	1.4	4.0	1.9	0.0	-	-	1.3	1.5
Articulated Trucks	3	7	0	0	-	10	0	1	0	0	-	1	0	2	1	0	-	3	1	2	1	0	-	4	18
% Articulated Trucks	2.4	6.5	0.0	-	-	4.1	0.0	1.2	0.0	-	-	0.6	0.0	1.9	2.9	-	-	2.1	4.0	1.0	0.7	-	-	1.0	1.9
Pedestrians	-	-	-	-	6	-	-	-	-	-	5	-	-	-	-	-	0	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
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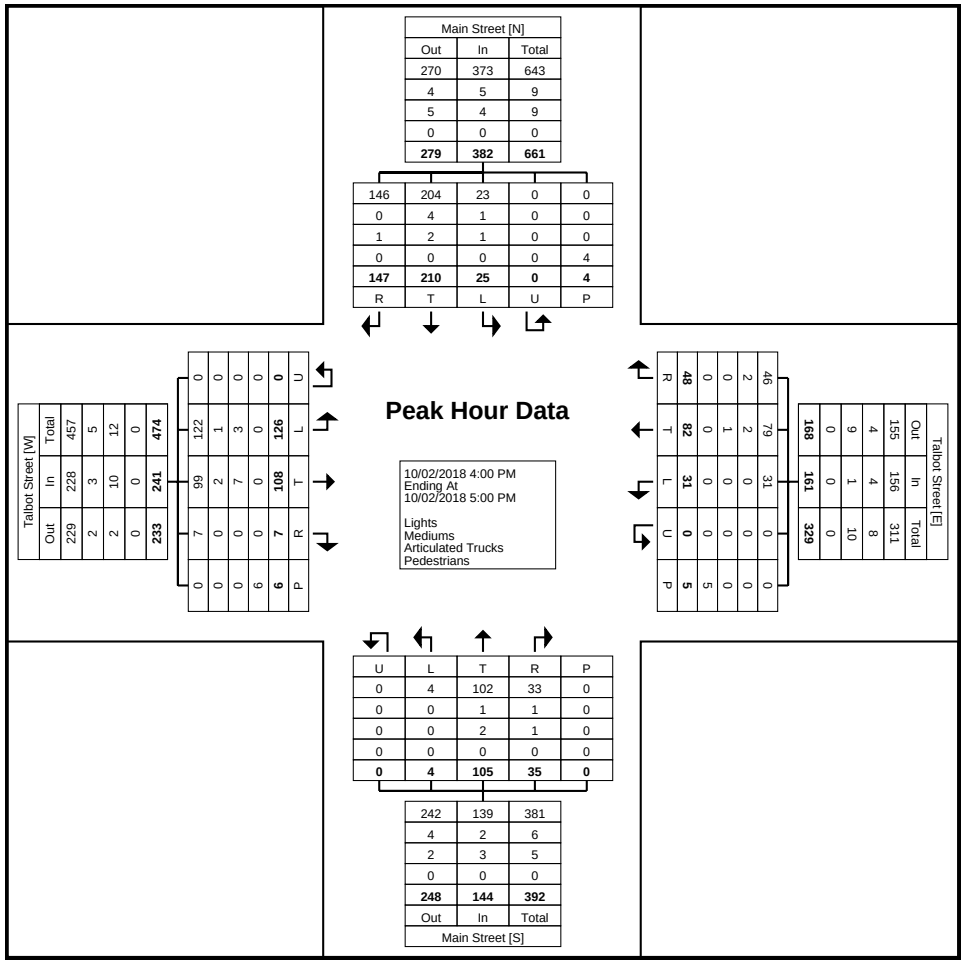
Start Date: 10/02/2018
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Main Street
Site Code:
Start Date: 10/02/2018
Page No: 10

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Carddock Blvd
Site Code:
Start Date: 10/02/2018
Page No: 1

Turning Movement Data

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Craddock Blvd Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	2	22	0	0	24	15	2	0	0	17	1	2	0	0	3	44
7:15 AM	1	33	0	0	34	22	1	0	0	23	3	4	0	1	7	64
7:30 AM	2	35	0	0	37	23	3	0	0	26	1	3	0	0	4	67
7:45 AM	1	34	0	0	35	38	3	0	0	41	2	4	0	0	6	82
Hourly Total	6	124	0	0	130	98	9	0	0	107	7	13	0	1	20	257
8:00 AM	4	25	0	0	29	28	2	0	0	30	2	2	0	1	4	63
8:15 AM	2	32	0	0	34	36	1	0	0	37	1	5	0	0	6	77
8:30 AM	1	30	0	0	31	33	1	0	0	34	3	5	0	0	8	73
8:45 AM	1	34	0	0	35	33	3	0	0	36	2	3	0	0	5	76
Hourly Total	8	121	0	0	129	130	7	0	0	137	8	15	0	1	23	289
9:00 AM	3	27	0	0	30	44	1	0	0	45	3	3	0	2	6	81
9:15 AM	2	32	0	0	34	41	2	0	0	43	1	2	0	3	3	80
9:30 AM	5	24	0	0	29	32	1	0	0	33	2	5	0	0	7	69
9:45 AM	5	20	0	0	25	36	1	0	0	37	4	5	0	0	9	71
Hourly Total	15	103	0	0	118	153	5	0	0	158	10	15	0	5	25	301
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	3	29	0	0	32	38	1	0	0	39	4	6	0	0	10	81
11:45 AM	3	31	0	0	34	26	2	0	0	28	1	4	0	0	5	67
Hourly Total	6	60	0	0	66	64	3	0	0	67	5	10	0	0	15	148
12:00 PM	6	30	0	0	36	36	1	0	0	37	0	3	0	0	3	76
12:15 PM	5	39	0	0	44	34	2	0	0	36	2	2	0	0	4	84
12:30 PM	4	31	0	0	35	31	2	0	0	33	4	3	0	0	7	75
12:45 PM	4	21	3	0	28	29	3	0	0	32	3	7	0	0	10	70
Hourly Total	19	121	3	0	143	130	8	0	0	138	9	15	0	0	24	305
1:00 PM	3	30	0	0	33	35	4	0	0	39	0	2	0	0	2	74
1:15 PM	6	36	0	0	42	31	1	0	0	32	0	3	0	0	3	77
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	9	66	0	0	75	66	5	0	0	71	0	5	0	0	5	151
3:00 PM	5	43	0	2	48	39	0	0	0	39	1	5	0	0	6	93
3:15 PM	6	42	0	0	48	37	2	0	0	39	1	4	0	1	5	92
3:30 PM	7	21	0	0	28	32	3	0	0	35	0	5	0	0	5	68
3:45 PM	4	38	0	0	42	26	0	0	0	26	2	1	0	0	3	71
Hourly Total	22	144	0	2	166	134	5	0	0	139	4	15	0	1	19	324
4:00 PM	4	27	0	0	31	30	4	0	0	34	2	2	0	0	4	69
4:15 PM	6	33	0	2	39	31	3	0	0	34	5	2	0	1	7	80

4:30 PM	6	44	0	0	50	34	2	0	0	36	0	1	0	0	1	87
4:45 PM	5	48	0	0	53	45	4	0	0	49	1	2	0	0	3	105
Hourly Total	21	152	0	2	173	140	13	0	0	153	8	7	0	1	15	341
5:00 PM	6	37	0	0	43	33	2	0	0	35	1	2	0	0	3	81
5:15 PM	3	32	0	0	35	52	5	0	0	57	2	3	0	0	5	97
5:30 PM	4	33	0	1	37	43	3	0	0	46	0	0	0	0	0	83
5:45 PM	4	20	0	0	24	35	1	0	0	36	1	4	0	1	5	65
Hourly Total	17	122	0	1	139	163	11	0	0	174	4	9	0	1	13	326
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	123	1013	3	5	1139	1078	66	0	0	1144	55	104	0	10	159	2442
Approach %	10.8	88.9	0.3	-	-	94.2	5.8	0.0	-	-	34.6	65.4	0.0	-	-	-
Total %	5.0	41.5	0.1	-	46.6	44.1	2.7	0.0	-	46.8	2.3	4.3	0.0	-	6.5	-
Lights	123	929	3	-	1055	1008	59	0	-	1067	51	99	0	-	150	2272
% Lights	100.0	91.7	100.0	-	92.6	93.5	89.4	-	-	93.3	92.7	95.2	-	-	94.3	93.0
Mediums	0	46	0	-	46	35	6	0	-	41	3	5	0	-	8	95
% Mediums	0.0	4.5	0.0	-	4.0	3.2	9.1	-	-	3.6	5.5	4.8	-	-	5.0	3.9
Articulated Trucks	0	38	0	-	38	35	1	0	-	36	1	0	0	-	1	75
% Articulated Trucks	0.0	3.8	0.0	-	3.3	3.2	1.5	-	-	3.1	1.8	0.0	-	-	0.6	3.1
Pedestrians	-	-	-	5	-	-	-	-	0	-	-	-	-	10	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
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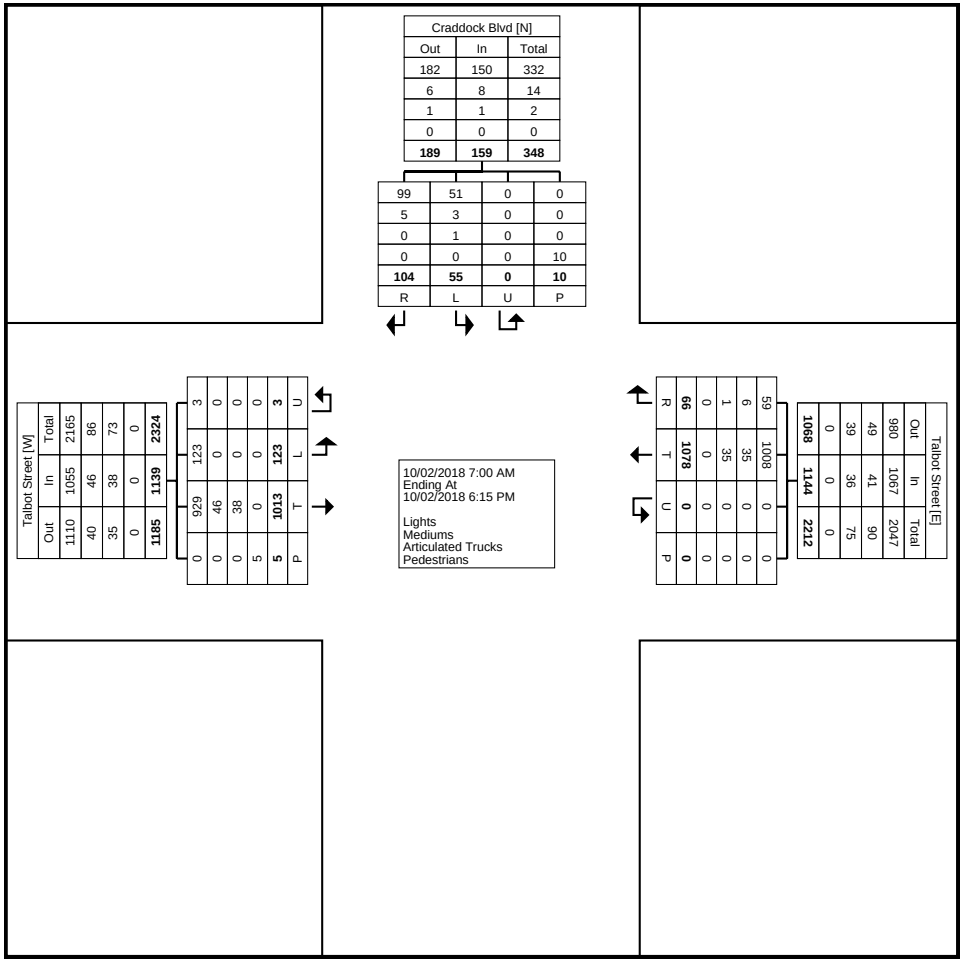
Start Date: 10/02/2018
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Talbot Street & Carddock Blvd
Site Code:
Start Date: 10/02/2018
Page No: 4

Turning Movement Peak Hour Data (8:30 AM)

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Craddock Blvd Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
8:30 AM	1	30	0	0	31	33	1	0	0	34	3	5	0	0	8	73
8:45 AM	1	34	0	0	35	33	3	0	0	36	2	3	0	0	5	76
9:00 AM	3	27	0	0	30	44	1	0	0	45	3	3	0	2	6	81
9:15 AM	2	32	0	0	34	41	2	0	0	43	1	2	0	3	3	80
Total	7	123	0	0	130	151	7	0	0	158	9	13	0	5	22	310
Approach %	5.4	94.6	0.0	-	-	95.6	4.4	0.0	-	-	40.9	59.1	0.0	-	-	-
Total %	2.3	39.7	0.0	-	41.9	48.7	2.3	0.0	-	51.0	2.9	4.2	0.0	-	7.1	-
PHF	0.583	0.904	0.000	-	0.929	0.858	0.583	0.000	-	0.878	0.750	0.650	0.000	-	0.688	0.957
Lights	7	109	0	-	116	136	6	0	-	142	7	12	0	-	19	277
% Lights	100.0	88.6	-	-	89.2	90.1	85.7	-	-	89.9	77.8	92.3	-	-	86.4	89.4
Mediums	0	6	0	-	6	8	1	0	-	9	1	1	0	-	2	17
% Mediums	0.0	4.9	-	-	4.6	5.3	14.3	-	-	5.7	11.1	7.7	-	-	9.1	5.5
Articulated Trucks	0	8	0	-	8	7	0	0	-	7	1	0	0	-	1	16
% Articulated Trucks	0.0	6.5	-	-	6.2	4.6	0.0	-	-	4.4	11.1	0.0	-	-	4.5	5.2
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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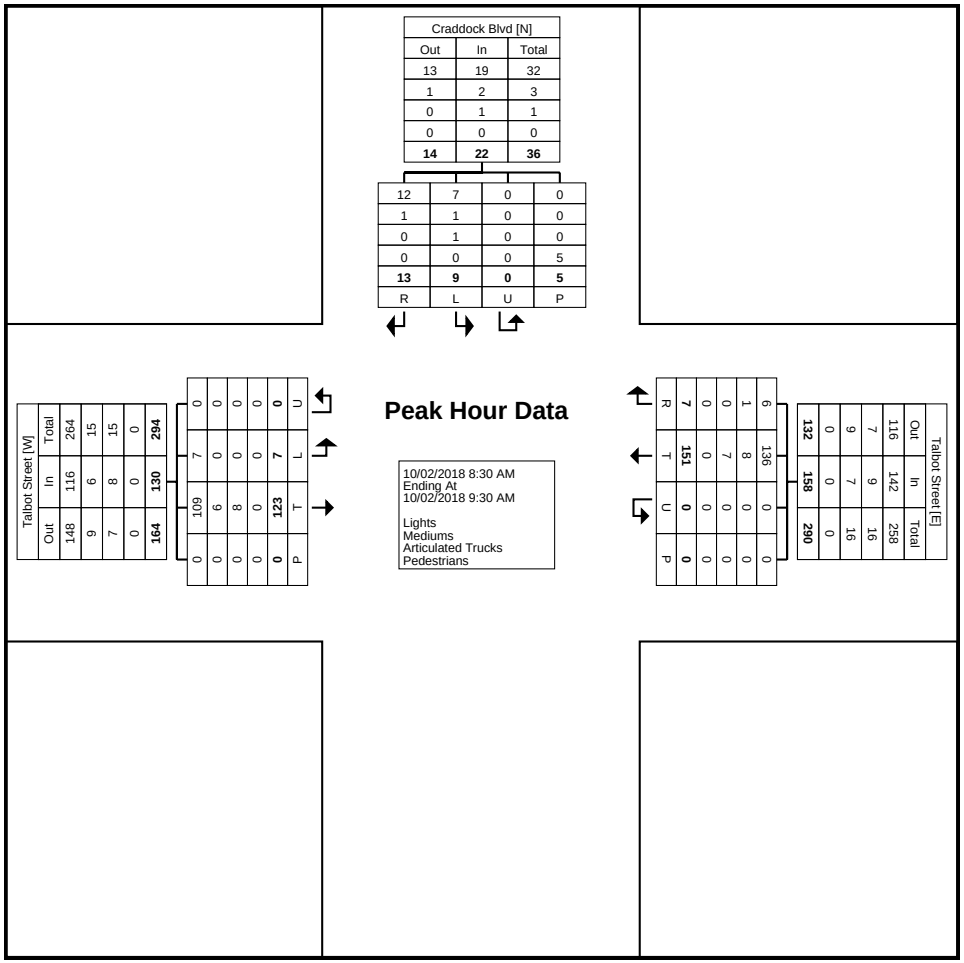
Page No: 5



Turning Movement Peak Hour Data Plot (8:30 AM)

Paradigm Transportation Solutions Limited
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Count Name: Talbot Street & Carddock Blvd
Site Code:
Start Date: 10/02/2018
Page No: 6

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Craddock Blvd Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:30 AM	3	29	0	0	32	38	1	0	0	39	4	6	0	0	10	81
11:45 AM	3	31	0	0	34	26	2	0	0	28	1	4	0	0	5	67
12:00 PM	6	30	0	0	36	36	1	0	0	37	0	3	0	0	3	76
12:15 PM	5	39	0	0	44	34	2	0	0	36	2	2	0	0	4	84
Total	17	129	0	0	146	134	6	0	0	140	7	15	0	0	22	308
Approach %	11.6	88.4	0.0	-	-	95.7	4.3	0.0	-	-	31.8	68.2	0.0	-	-	-
Total %	5.5	41.9	0.0	-	47.4	43.5	1.9	0.0	-	45.5	2.3	4.9	0.0	-	7.1	-
PHF	0.708	0.827	0.000	-	0.830	0.882	0.750	0.000	-	0.897	0.438	0.625	0.000	-	0.550	0.917
Lights	17	120	0	-	137	128	6	0	-	134	7	15	0	-	22	293
% Lights	100.0	93.0	-	-	93.8	95.5	100.0	-	-	95.7	100.0	100.0	-	-	100.0	95.1
Mediums	0	6	0	-	6	3	0	0	-	3	0	0	0	-	0	9
% Mediums	0.0	4.7	-	-	4.1	2.2	0.0	-	-	2.1	0.0	0.0	-	-	0.0	2.9
Articulated Trucks	0	3	0	-	3	3	0	0	-	3	0	0	0	-	0	6
% Articulated Trucks	0.0	2.3	-	-	2.1	2.2	0.0	-	-	2.1	0.0	0.0	-	-	0.0	1.9
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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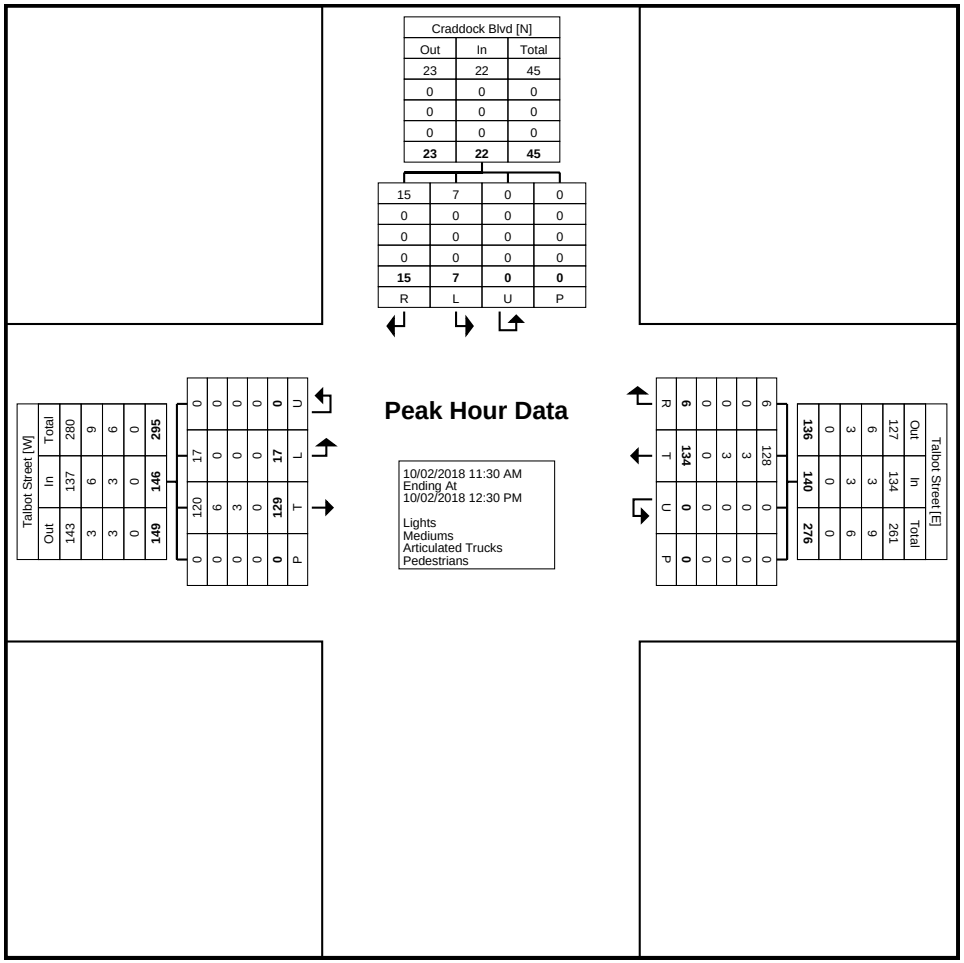
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Carddock Blvd
Site Code:
Start Date: 10/02/2018
Page No: 7



Turning Movement Peak Hour Data Plot (11:30 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Carddock Blvd
Site Code:
Start Date: 10/02/2018
Page No: 8

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Craddock Blvd Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	6	44	0	0	50	34	2	0	0	36	0	1	0	0	1	87
4:45 PM	5	48	0	0	53	45	4	0	0	49	1	2	0	0	3	105
5:00 PM	6	37	0	0	43	33	2	0	0	35	1	2	0	0	3	81
5:15 PM	3	32	0	0	35	52	5	0	0	57	2	3	0	0	5	97
Total	20	161	0	0	181	164	13	0	0	177	4	8	0	0	12	370
Approach %	11.0	89.0	0.0	-	-	92.7	7.3	0.0	-	-	33.3	66.7	0.0	-	-	-
Total %	5.4	43.5	0.0	-	48.9	44.3	3.5	0.0	-	47.8	1.1	2.2	0.0	-	3.2	-
PHF	0.833	0.839	0.000	-	0.854	0.788	0.650	0.000	-	0.776	0.500	0.667	0.000	-	0.600	0.881
Lights	20	152	0	-	172	159	13	0	-	172	3	8	0	-	11	355
% Lights	100.0	94.4	-	-	95.0	97.0	100.0	-	-	97.2	75.0	100.0	-	-	91.7	95.9
Mediums	0	3	0	-	3	3	0	0	-	3	1	0	0	-	1	7
% Mediums	0.0	1.9	-	-	1.7	1.8	0.0	-	-	1.7	25.0	0.0	-	-	8.3	1.9
Articulated Trucks	0	6	0	-	6	2	0	0	-	2	0	0	0	-	0	8
% Articulated Trucks	0.0	3.7	-	-	3.3	1.2	0.0	-	-	1.1	0.0	0.0	-	-	0.0	2.2
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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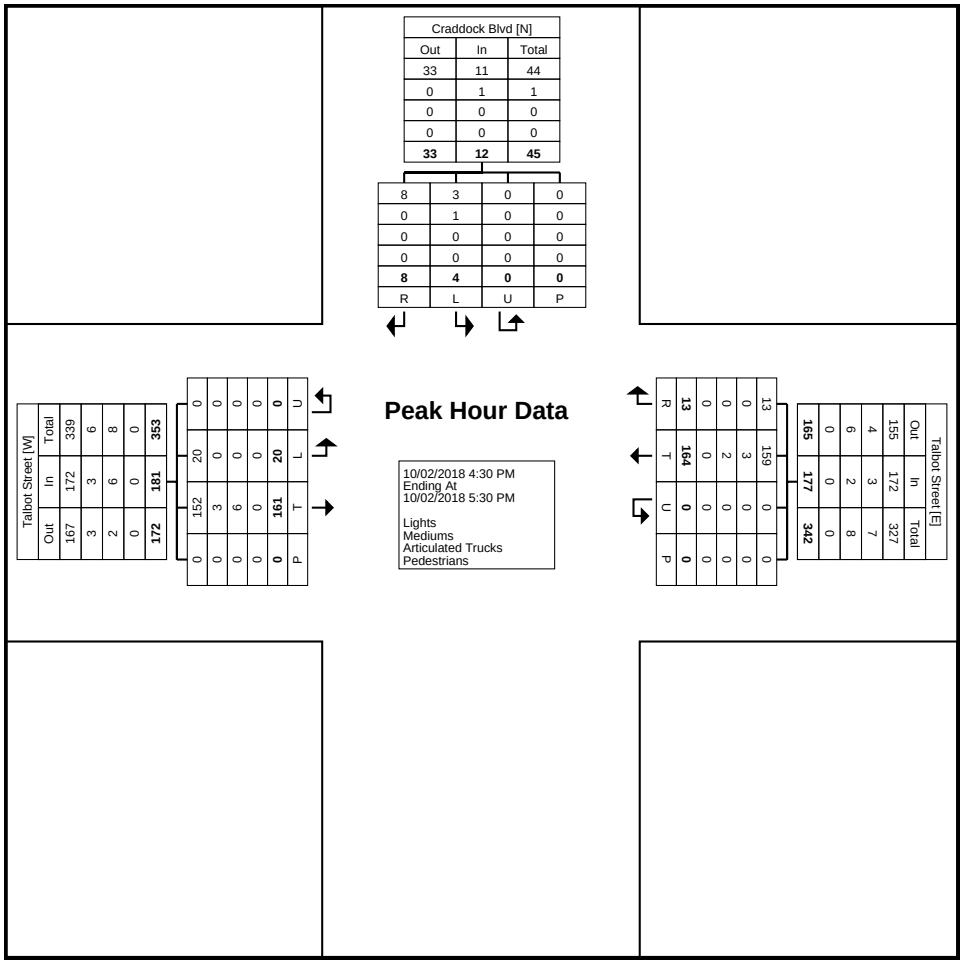
Page No: 9



Turning Movement Peak Hour Data Plot (4:30 PM)

Paradigm Transportation Solutions Limited
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Count Name: Talbot Street & Carddock Blvd
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Page No: 10

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Count Name: Talbot Street & Saunders Drive
Site Code:
Start Date: 10/02/2018
Page No: 1

Turning Movement Data

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Saunders Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	21	0	0	21	22	0	0	0	22	4	0	0	0	4	47
7:15 AM	3	34	0	0	37	27	0	0	0	27	3	1	0	1	4	68
7:30 AM	1	27	0	0	28	31	3	0	0	34	2	2	0	0	4	66
7:45 AM	1	25	0	0	26	38	2	0	0	40	3	3	0	0	6	72
Hourly Total	5	107	0	0	112	118	5	0	0	123	12	6	0	1	18	253
8:00 AM	4	24	0	0	28	31	0	0	0	31	2	1	0	1	3	62
8:15 AM	0	32	0	0	32	30	2	0	0	32	1	1	0	0	2	66
8:30 AM	1	31	0	0	32	28	5	0	0	33	5	2	0	0	7	72
8:45 AM	1	28	0	0	29	30	3	0	0	33	2	2	0	0	4	66
Hourly Total	6	115	0	0	121	119	10	0	0	129	10	6	0	1	16	266
9:00 AM	0	30	0	0	30	39	2	0	0	41	1	3	0	1	4	75
9:15 AM	2	32	0	0	34	41	0	0	0	41	2	2	0	2	4	79
9:30 AM	2	28	0	0	30	29	1	0	0	30	1	1	0	0	2	62
9:45 AM	2	16	0	0	18	27	0	0	0	27	0	1	0	0	1	46
Hourly Total	6	106	0	0	112	136	3	0	0	139	4	7	0	3	11	262
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	1	35	0	0	36	35	2	0	0	37	2	0	0	0	2	75
11:45 AM	1	29	0	0	30	21	3	1	0	25	3	1	0	0	4	59
Hourly Total	2	64	0	0	66	56	5	1	0	62	5	1	0	0	6	134
12:00 PM	1	26	0	0	27	35	4	0	0	39	1	2	0	0	3	69
12:15 PM	1	36	0	0	37	35	0	0	0	35	0	1	0	1	1	73
12:30 PM	2	32	0	0	34	29	1	0	0	30	1	2	0	0	3	67
12:45 PM	1	20	0	0	21	29	2	0	0	31	2	0	0	0	2	54
Hourly Total	5	114	0	0	119	128	7	0	0	135	4	5	0	1	9	263
1:00 PM	1	29	0	0	30	35	3	0	0	38	2	1	0	0	3	71
1:15 PM	1	30	1	0	32	29	1	0	0	30	3	2	0	0	5	67
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	2	59	1	0	62	64	4	0	0	68	5	3	0	0	8	138
3:00 PM	2	42	0	0	44	40	0	1	1	41	2	0	0	0	2	87
3:15 PM	4	37	0	0	41	31	1	0	0	32	1	0	0	0	1	74
3:30 PM	0	22	0	0	22	35	3	0	0	38	0	0	0	0	0	60
3:45 PM	2	35	0	0	37	23	2	0	0	25	3	0	0	0	3	65
Hourly Total	8	136	0	0	144	129	6	1	1	136	6	0	0	0	6	286
4:00 PM	1	29	0	0	30	34	2	0	0	36	2	2	0	0	4	70
4:15 PM	2	33	0	0	35	35	5	0	0	40	1	2	0	0	3	78

4:30 PM	2	44	0	0	46	35	2	0	0	37	0	2	0	0	2	85
4:45 PM	4	43	0	0	47	38	4	0	0	42	3	1	0	0	4	93
Hourly Total	9	149	0	0	158	142	13	0	0	155	6	7	0	0	13	326
5:00 PM	4	33	0	0	37	39	3	0	1	42	1	1	0	0	2	81
5:15 PM	3	28	0	0	31	52	3	0	0	55	4	0	0	1	4	90
5:30 PM	1	32	0	0	33	39	7	0	0	46	2	1	0	0	3	82
5:45 PM	1	20	0	0	21	35	2	0	0	37	1	1	0	2	2	60
Hourly Total	9	113	0	0	122	165	15	0	1	180	8	3	0	3	11	313
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	52	963	1	0	1016	1057	68	2	2	1127	60	38	0	9	98	2241
Approach %	5.1	94.8	0.1	-	-	93.8	6.0	0.2	-	-	61.2	38.8	0.0	-	-	-
Total %	2.3	43.0	0.0	-	45.3	47.2	3.0	0.1	-	50.3	2.7	1.7	0.0	-	4.4	-
Lights	51	872	1	-	924	979	66	2	-	1047	59	36	0	-	95	2066
% Lights	98.1	90.6	100.0	-	90.9	92.6	97.1	100.0	-	92.9	98.3	94.7	-	-	96.9	92.2
Mediums	1	43	0	-	44	44	1	0	-	45	1	1	0	-	2	91
% Mediums	1.9	4.5	0.0	-	4.3	4.2	1.5	0.0	-	4.0	1.7	2.6	-	-	2.0	4.1
Articulated Trucks	0	48	0	-	48	34	1	0	-	35	0	1	0	-	1	84
% Articulated Trucks	0.0	5.0	0.0	-	4.7	3.2	1.5	0.0	-	3.1	0.0	2.6	-	-	1.0	3.7
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	9	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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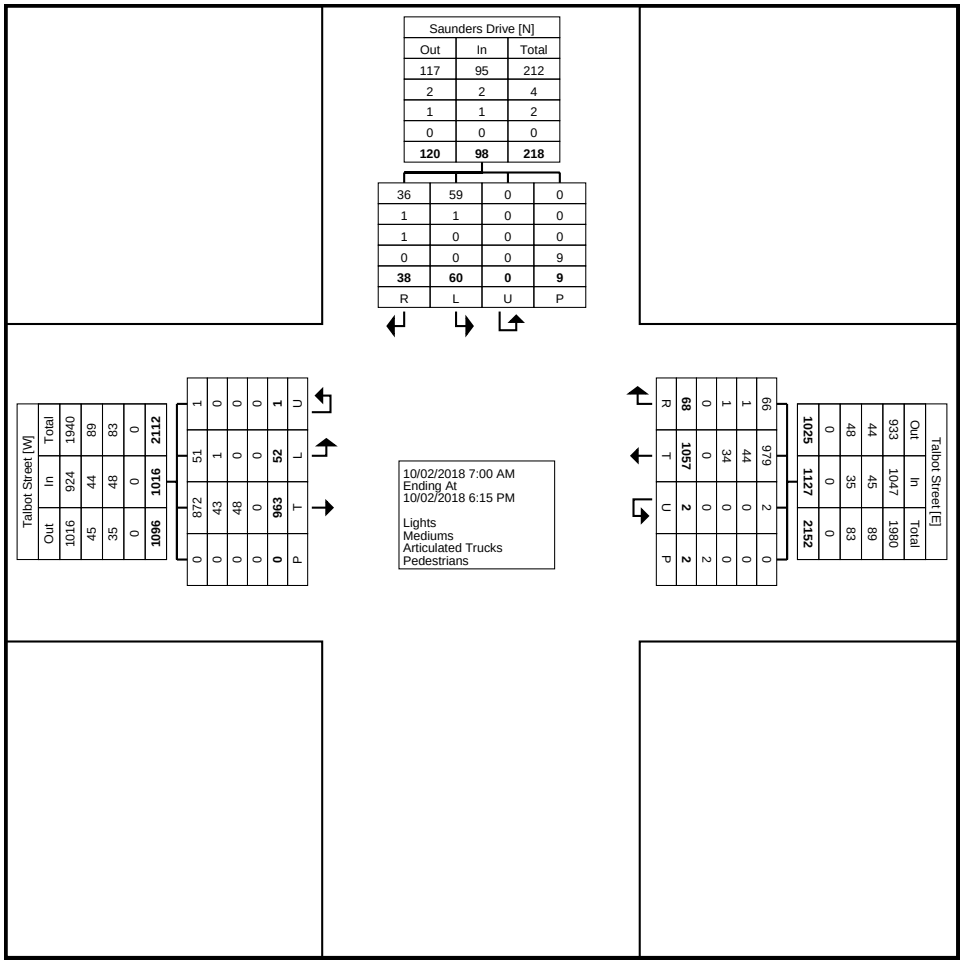
Count Name: Talbot Street & Saunders Drive
Site Code:
Start Date: 10/02/2018
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street & Saunders Drive
Site Code:
Start Date: 10/02/2018
Page No: 4

Turning Movement Peak Hour Data (8:30 AM)

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Saunders Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
8:30 AM	1	31	0	0	32	28	5	0	0	33	5	2	0	0	7	72
8:45 AM	1	28	0	0	29	30	3	0	0	33	2	2	0	0	4	66
9:00 AM	0	30	0	0	30	39	2	0	0	41	1	3	0	1	4	75
9:15 AM	2	32	0	0	34	41	0	0	0	41	2	2	0	2	4	79
Total	4	121	0	0	125	138	10	0	0	148	10	9	0	3	19	292
Approach %	3.2	96.8	0.0	-	-	93.2	6.8	0.0	-	-	52.6	47.4	0.0	-	-	-
Total %	1.4	41.4	0.0	-	42.8	47.3	3.4	0.0	-	50.7	3.4	3.1	0.0	-	6.5	-
PHF	0.500	0.945	0.000	-	0.919	0.841	0.500	0.000	-	0.902	0.500	0.750	0.000	-	0.679	0.924
Lights	4	105	0	-	109	123	9	0	-	132	10	8	0	-	18	259
% Lights	100.0	86.8	-	-	87.2	89.1	90.0	-	-	89.2	100.0	88.9	-	-	94.7	88.7
Mediums	0	8	0	-	8	8	0	0	-	8	0	0	0	-	0	16
% Mediums	0.0	6.6	-	-	6.4	5.8	0.0	-	-	5.4	0.0	0.0	-	-	0.0	5.5
Articulated Trucks	0	8	0	-	8	7	1	0	-	8	0	1	0	-	1	17
% Articulated Trucks	0.0	6.6	-	-	6.4	5.1	10.0	-	-	5.4	0.0	11.1	-	-	5.3	5.8
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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Count Name: Talbot Street & Saunders Drive
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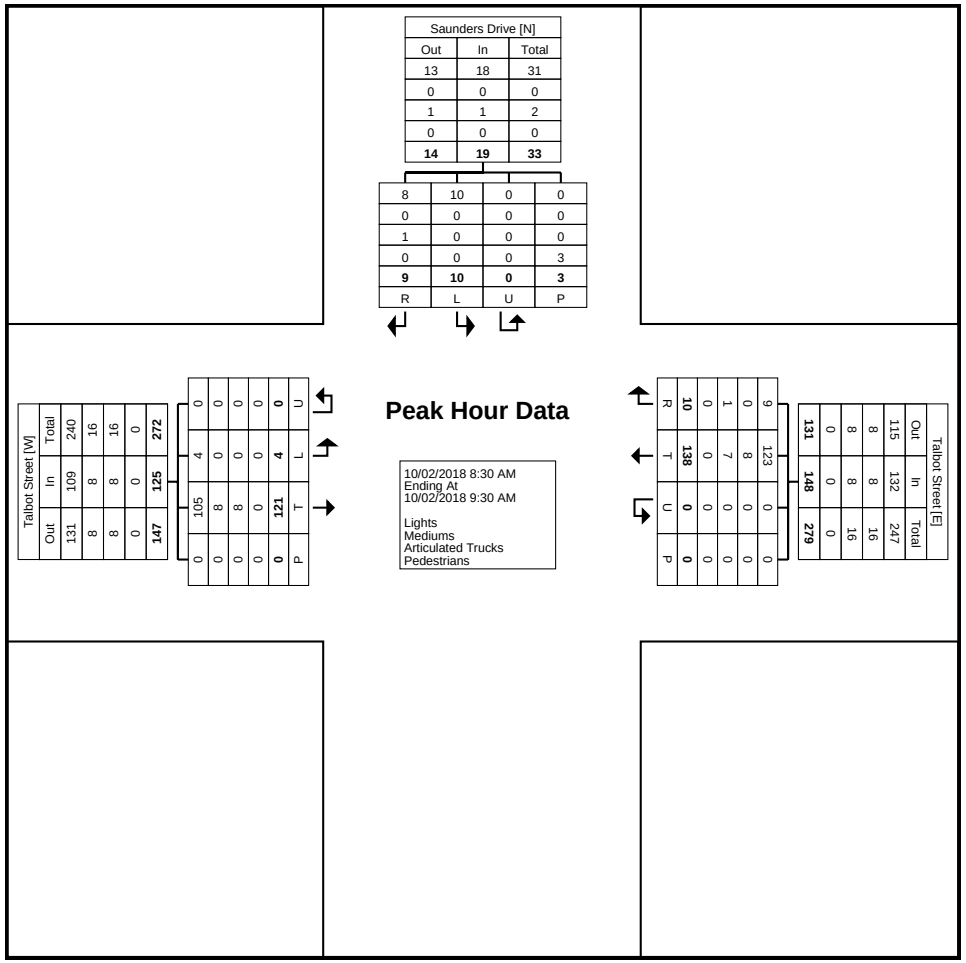
Start Date: 10/02/2018
Page No: 5



Turning Movement Peak Hour Data Plot (8:30 AM)

Paradigm Transportation Solutions Limited
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Count Name: Talbot Street & Saunders Drive
Site Code:
Start Date: 10/02/2018
Page No: 6

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Saunders Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:30 AM	1	35	0	0	36	35	2	0	0	37	2	0	0	0	2	75
11:45 AM	1	29	0	0	30	21	3	1	0	25	3	1	0	0	4	59
12:00 PM	1	26	0	0	27	35	4	0	0	39	1	2	0	0	3	69
12:15 PM	1	36	0	0	37	35	0	0	0	35	0	1	0	1	1	73
Total	4	126	0	0	130	126	9	1	0	136	6	4	0	1	10	276
Approach %	3.1	96.9	0.0	-	-	92.6	6.6	0.7	-	-	60.0	40.0	0.0	-	-	-
Total %	1.4	45.7	0.0	-	47.1	45.7	3.3	0.4	-	49.3	2.2	1.4	0.0	-	3.6	-
PHF	1.000	0.875	0.000	-	0.878	0.900	0.563	0.250	-	0.872	0.500	0.500	0.000	-	0.625	0.920
Lights	4	111	0	-	115	119	9	1	-	129	6	4	0	-	10	254
% Lights	100.0	88.1	-	-	88.5	94.4	100.0	100.0	-	94.9	100.0	100.0	-	-	100.0	92.0
Mediums	0	6	0	-	6	5	0	0	-	5	0	0	0	-	0	11
% Mediums	0.0	4.8	-	-	4.6	4.0	0.0	0.0	-	3.7	0.0	0.0	-	-	0.0	4.0
Articulated Trucks	0	9	0	-	9	2	0	0	-	2	0	0	0	-	0	11
% Articulated Trucks	0.0	7.1	-	-	6.9	1.6	0.0	0.0	-	1.5	0.0	0.0	-	-	0.0	4.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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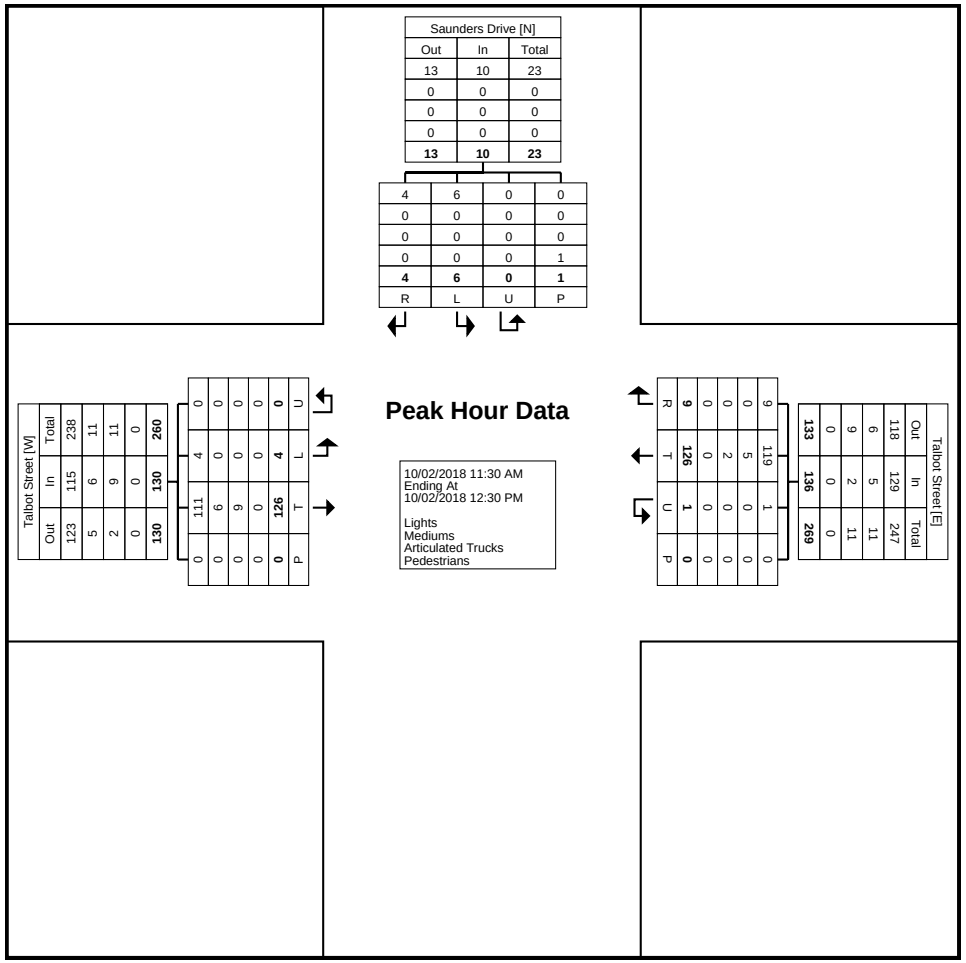
Site Code:
Start Date: 10/02/2018
Page No: 7



Turning Movement Peak Hour Data Plot (11:30 AM)

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Count Name: Talbot Street & Saunders Drive
Site Code:
Start Date: 10/02/2018
Page No: 8

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Talbot Street Eastbound					Talbot Street Westbound					Saunders Drive Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	2	44	0	0	46	35	2	0	0	37	0	2	0	0	2	85
4:45 PM	4	43	0	0	47	38	4	0	0	42	3	1	0	0	4	93
5:00 PM	4	33	0	0	37	39	3	0	1	42	1	1	0	0	2	81
5:15 PM	3	28	0	0	31	52	3	0	0	55	4	0	0	1	4	90
Total	13	148	0	0	161	164	12	0	1	176	8	4	0	1	12	349
Approach %	8.1	91.9	0.0	-	-	93.2	6.8	0.0	-	-	66.7	33.3	0.0	-	-	-
Total %	3.7	42.4	0.0	-	46.1	47.0	3.4	0.0	-	50.4	2.3	1.1	0.0	-	3.4	-
PHF	0.813	0.841	0.000	-	0.856	0.788	0.750	0.000	-	0.800	0.500	0.500	0.000	-	0.750	0.938
Lights	13	139	0	-	152	159	12	0	-	171	8	4	0	-	12	335
% Lights	100.0	93.9	-	-	94.4	97.0	100.0	-	-	97.2	100.0	100.0	-	-	100.0	96.0
Mediums	0	3	0	-	3	3	0	0	-	3	0	0	0	-	0	6
% Mediums	0.0	2.0	-	-	1.9	1.8	0.0	-	-	1.7	0.0	0.0	-	-	0.0	1.7
Articulated Trucks	0	6	0	-	6	2	0	0	-	2	0	0	0	-	0	8
% Articulated Trucks	0.0	4.1	-	-	3.7	1.2	0.0	-	-	1.1	0.0	0.0	-	-	0.0	2.3
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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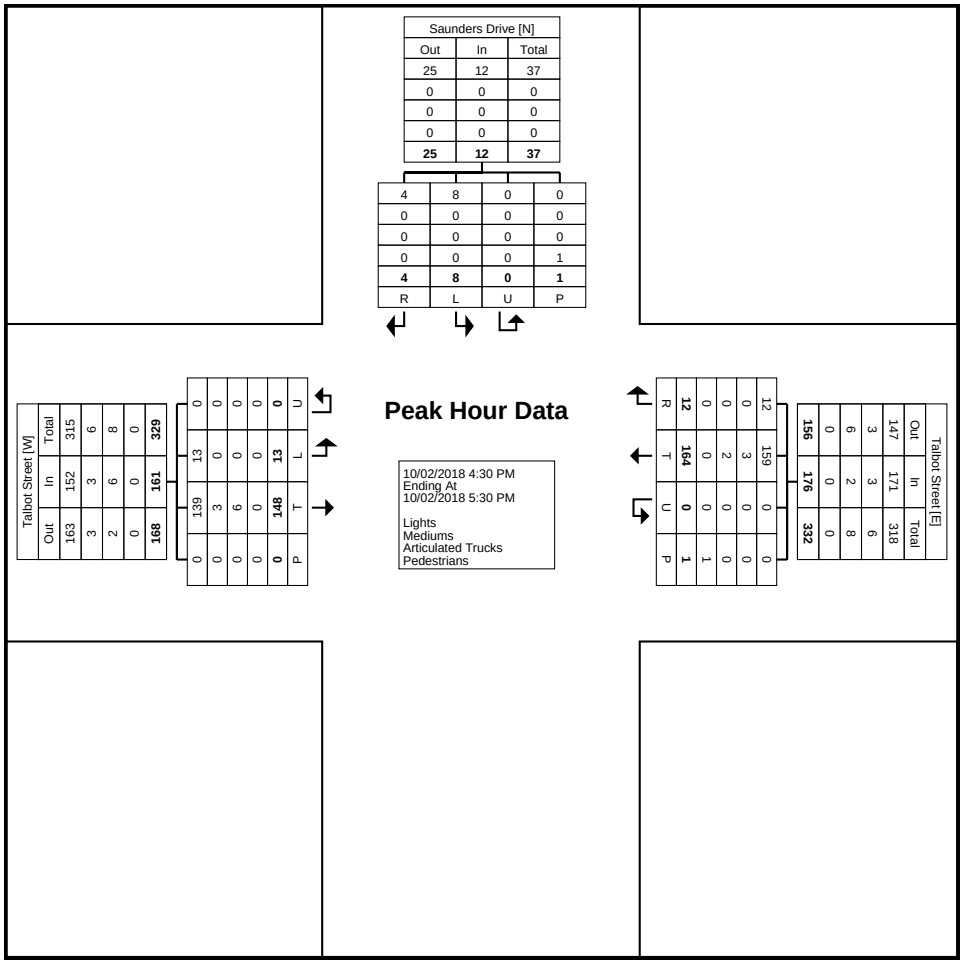
Page No: 9



Turning Movement Peak Hour Data Plot (4:30 PM)

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Page No: 10

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Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 1

Turning Movement Data

Start Time	Talbot Road Eastbound						Talbot Road Westbound						Nanticoke Road Northbound						Nanticoke Road Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	4	18	2	0	0	24	1	13	1	0	0	15	7	21	1	0	0	29	2	24	2	0	0	28	96
7:15 AM	3	21	8	0	0	32	8	19	3	0	0	30	6	17	1	0	0	24	0	35	5	0	0	40	126
7:30 AM	3	21	4	0	0	28	5	27	1	0	0	33	2	10	1	0	0	13	3	22	5	0	0	30	104
7:45 AM	3	22	2	0	0	27	1	36	5	0	0	42	6	12	1	0	0	19	0	21	4	0	0	25	113
Hourly Total	13	82	16	0	0	111	15	95	10	0	0	120	21	60	4	0	0	85	5	102	16	0	0	123	439
8:00 AM	1	14	3	0	0	18	4	23	3	0	0	30	5	10	3	0	0	18	3	10	5	0	0	18	84
8:15 AM	1	24	3	0	0	28	1	26	3	0	0	30	2	3	3	0	0	8	3	12	5	0	0	20	86
8:30 AM	5	20	6	0	0	31	0	18	6	0	0	24	6	8	1	0	0	15	2	9	5	0	0	16	86
8:45 AM	3	22	6	0	0	31	2	24	9	0	0	35	2	4	1	0	0	7	2	18	4	0	0	24	97
Hourly Total	10	80	18	0	0	108	7	91	21	0	0	119	15	25	8	0	0	48	10	49	19	0	0	78	353
9:00 AM	4	24	2	0	0	30	2	32	2	0	0	36	12	6	0	0	0	18	6	5	6	0	0	17	101
9:15 AM	3	17	3	0	0	23	2	32	4	0	0	38	6	12	2	0	0	20	3	7	2	0	0	12	93
9:30 AM	4	17	4	0	0	25	0	26	2	0	0	28	3	3	1	0	0	7	1	11	6	0	0	18	78
9:45 AM	2	13	5	0	0	20	0	24	1	0	0	25	1	8	0	0	0	9	2	9	3	0	0	14	68
Hourly Total	13	71	14	0	0	98	4	114	9	0	0	127	22	29	3	0	0	54	12	32	17	0	0	61	340
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	6	24	4	0	0	34	3	23	2	0	0	28	5	9	2	1	0	17	2	9	5	0	0	16	95
11:45 AM	3	26	8	0	0	37	2	16	0	0	0	18	4	11	3	0	0	18	1	8	5	0	0	14	87
Hourly Total	9	50	12	0	0	71	5	39	2	0	0	46	9	20	5	1	0	35	3	17	10	0	0	30	182
12:00 PM	4	23	1	0	0	28	2	26	1	0	0	29	8	8	2	0	0	18	1	10	2	0	0	13	88
12:15 PM	2	30	2	0	0	34	3	24	5	0	0	32	6	14	1	0	0	21	2	16	1	0	0	19	106
12:30 PM	3	24	5	0	0	32	0	24	3	0	0	27	5	7	0	0	0	12	2	6	1	0	0	9	80
12:45 PM	2	16	3	0	0	21	0	18	0	0	0	18	6	15	0	0	0	21	3	6	8	0	0	17	77
Hourly Total	11	93	11	0	0	115	5	92	9	0	0	106	25	44	3	0	0	72	8	38	12	0	0	58	351
1:00 PM	1	25	5	0	0	31	2	30	3	0	0	35	2	7	1	0	0	10	1	7	6	0	0	14	90
1:15 PM	4	28	3	0	0	35	1	19	2	0	0	22	6	17	2	0	0	25	1	7	4	0	0	12	94
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	5	53	8	0	0	66	3	49	5	0	0	57	8	24	3	0	0	35	2	15	10	0	0	27	185
3:00 PM	4	34	3	0	0	41	2	33	1	0	0	36	6	14	1	0	0	21	6	9	3	0	0	18	116
3:15 PM	6	33	1	0	0	40	0	21	3	0	0	24	3	21	3	0	0	27	2	7	0	0	0	9	100
3:30 PM	3	16	4	0	0	23	2	26	1	0	0	29	7	13	4	0	0	24	5	9	3	0	0	17	93
3:45 PM	1	36	3	0	0	40	2	20	4	0	0	26	2	20	1	0	0	23	2	7	4	0	0	13	102
Hourly Total	14	119	11	0	0	144	6	100	9	0	0	115	18	68	9	0	0	95	15	32	10	0	0	57	411
4:00 PM	5	23	5	0	0	33	0	20	2	0	0	22	9	39	5	0	0	53	5	7	8	0	0	20	128

4:15 PM	4	26	3	0	0	33	3	35	0	0	0	38	4	19	4	0	0	27	7	4	4	0	0	15	113
4:30 PM	0	38	6	0	0	44	1	28	1	0	0	30	3	23	4	0	0	30	7	9	3	0	0	19	123
4:45 PM	2	42	2	0	0	46	1	29	2	0	0	32	6	7	1	0	0	14	4	5	5	0	0	14	106
Hourly Total	11	129	16	0	0	156	5	112	5	0	0	122	22	88	14	0	0	124	23	25	20	0	0	68	470
5:00 PM	5	33	2	0	0	40	0	21	2	0	0	23	12	37	4	0	0	53	8	11	4	0	0	23	139
5:15 PM	2	24	4	0	0	30	0	35	5	0	0	40	10	25	2	0	0	37	0	8	4	0	0	12	119
5:30 PM	1	32	2	0	0	35	2	34	1	0	0	37	4	15	0	0	0	19	5	7	7	0	0	19	110
5:45 PM	3	16	5	0	0	24	2	30	1	0	0	33	2	8	0	0	0	10	0	12	5	0	0	17	84
Hourly Total	11	105	13	0	0	129	4	120	9	0	0	133	28	85	6	0	0	119	13	38	20	0	0	71	452
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	97	782	119	0	0	998	54	812	79	0	0	945	168	443	55	1	0	667	91	348	134	0	0	573	3183
Approach %	9.7	78.4	11.9	0.0	-	-	5.7	85.9	8.4	0.0	-	-	25.2	66.4	8.2	0.1	-	-	15.9	60.7	23.4	0.0	-	-	-
Total %	3.0	24.6	3.7	0.0	-	31.4	1.7	25.5	2.5	0.0	-	29.7	5.3	13.9	1.7	0.0	-	21.0	2.9	10.9	4.2	0.0	-	18.0	-
Lights	88	720	94	0	-	902	40	750	66	0	-	856	151	318	29	1	-	499	79	228	125	0	-	432	2689
% Lights	90.7	92.1	79.0	-	-	90.4	74.1	92.4	83.5	-	-	90.6	89.9	71.8	52.7	100.0	-	74.8	86.8	65.5	93.3	-	-	75.4	84.5
Mediums	6	36	11	0	-	53	4	39	12	0	-	55	8	24	11	0	-	43	10	25	8	0	-	43	194
% Mediums	6.2	4.6	9.2	-	-	5.3	7.4	4.8	15.2	-	-	5.8	4.8	5.4	20.0	0.0	-	6.4	11.0	7.2	6.0	-	-	7.5	6.1
Articulated Trucks	3	26	14	0	-	43	10	23	1	0	-	34	9	101	15	0	-	125	2	95	1	0	-	98	300
% Articulated Trucks	3.1	3.3	11.8	-	-	4.3	18.5	2.8	1.3	-	-	3.6	5.4	22.8	27.3	0.0	-	18.7	2.2	27.3	0.7	-	-	17.1	9.4
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
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Waterloo, Ontario, Canada N2J 1N8
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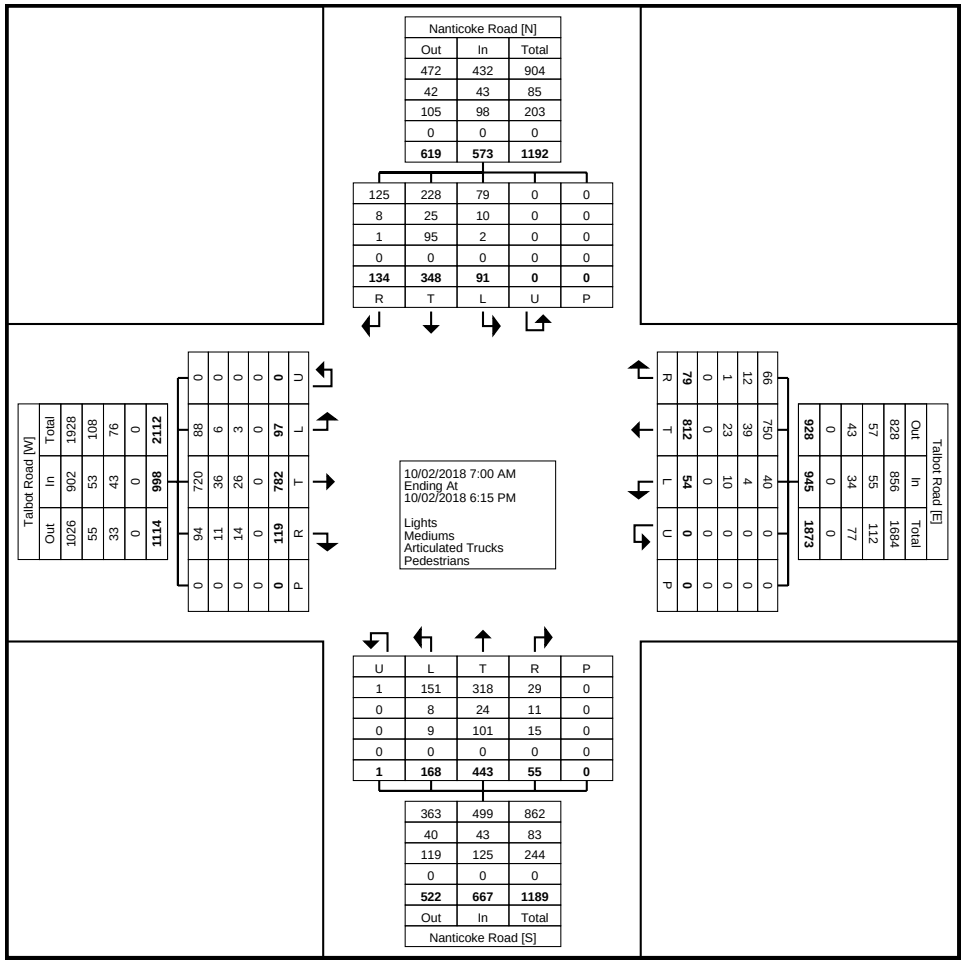
Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 4

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Talbot Road Eastbound						Talbot Road Westbound						Nanticoke Road Northbound						Nanticoke Road Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	4	18	2	0	0	24	1	13	1	0	0	15	7	21	1	0	0	29	2	24	2	0	0	28	96
7:15 AM	3	21	8	0	0	32	8	19	3	0	0	30	6	17	1	0	0	24	0	35	5	0	0	40	126
7:30 AM	3	21	4	0	0	28	5	27	1	0	0	33	2	10	1	0	0	13	3	22	5	0	0	30	104
7:45 AM	3	22	2	0	0	27	1	36	5	0	0	42	6	12	1	0	0	19	0	21	4	0	0	25	113
Total	13	82	16	0	0	111	15	95	10	0	0	120	21	60	4	0	0	85	5	102	16	0	0	123	439
Approach %	11.7	73.9	14.4	0.0	-	-	12.5	79.2	8.3	0.0	-	-	24.7	70.6	4.7	0.0	-	-	4.1	82.9	13.0	0.0	-	-	-
Total %	3.0	18.7	3.6	0.0	-	25.3	3.4	21.6	2.3	0.0	-	27.3	4.8	13.7	0.9	0.0	-	19.4	1.1	23.2	3.6	0.0	-	28.0	-
PHF	0.813	0.932	0.500	0.000	-	0.867	0.469	0.660	0.500	0.000	-	0.714	0.750	0.714	1.000	0.000	-	0.733	0.417	0.729	0.800	0.000	-	0.769	0.871
Lights	13	74	11	0	-	98	12	89	10	0	-	111	19	46	4	0	-	69	5	88	16	0	-	109	387
% Lights	100.0	90.2	68.8	-	-	88.3	80.0	93.7	100.0	-	-	92.5	90.5	76.7	100.0	-	-	81.2	100.0	86.3	100.0	-	-	88.6	88.2
Mediums	0	5	2	0	-	7	1	5	0	0	-	6	1	1	0	0	-	2	0	2	0	0	-	2	17
% Mediums	0.0	6.1	12.5	-	-	6.3	6.7	5.3	0.0	-	-	5.0	4.8	1.7	0.0	-	-	2.4	0.0	2.0	0.0	-	-	1.6	3.9
Articulated Trucks	0	3	3	0	-	6	2	1	0	0	-	3	1	13	0	0	-	14	0	12	0	0	-	12	35
% Articulated Trucks	0.0	3.7	18.8	-	-	5.4	13.3	1.1	0.0	-	-	2.5	4.8	21.7	0.0	-	-	16.5	0.0	11.8	0.0	-	-	9.8	8.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

paradigm

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 5

Peak Hour Data

10/02/2018 7:00 AM
Ending At
10/02/2018 8:00 AM

Lights
Mediums
Articulated Trucks
Pedestrians

Nanticoke Road [N]

Out	In	Total
69	109	178
1	2	3
13	12	25
0	0	0
83	**123**	**206**

R	T	L	U	P
16	88	5	0	0
0	2	0	0	0
0	12	0	0	0
0	0	0	0	0
16	**102**	**5**	**0**	**0**

Talbot Road [W]

Out	In	Total
124	98	222
6	7	13
2	6	8
0	0	0
132	**111**	**243**

U	L	T	R	P
0	13	74	11	0
0	0	5	2	0
0	0	3	3	0
0	0	0	0	0
0	**13**	**82**	**16**	**0**

Talbot Road [E]

Out	In	Total
83	111	194
5	6	11
3	3	6
0	0	0
91	**120**	**211**

R	T	L	U	P
10	89	12	0	0
0	5	1	0	0
0	1	2	0	0
0	0	0	0	0
10	**95**	**15**	**0**	**0**

U	L	T	R	P
0	19	46	4	0
0	1	1	0	0
0	1	13	0	0
0	0	0	0	0
0	**21**	**60**	**4**	**0**

Out	In	Total
111	69	180
5	2	7
17	14	31
0	0	0
133	**85**	**218**

Nanticoke Road [S]

Turning Movement Peak Hour Data Plot (7:00 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 6

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Talbot Road Eastbound						Talbot Road Westbound						Nanticoke Road Northbound						Nanticoke Road Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
11:30 AM	6	24	4	0	0	34	3	23	2	0	0	28	5	9	2	1	0	17	2	9	5	0	0	16	95
11:45 AM	3	26	8	0	0	37	2	16	0	0	0	18	4	11	3	0	0	18	1	8	5	0	0	14	87
12:00 PM	4	23	1	0	0	28	2	26	1	0	0	29	8	8	2	0	0	18	1	10	2	0	0	13	88
12:15 PM	2	30	2	0	0	34	3	24	5	0	0	32	6	14	1	0	0	21	2	16	1	0	0	19	106
Total	15	103	15	0	0	133	10	89	8	0	0	107	23	42	8	1	0	74	6	43	13	0	0	62	376
Approach %	11.3	77.4	11.3	0.0	-	-	9.3	83.2	7.5	0.0	-	-	31.1	56.8	10.8	1.4	-	-	9.7	69.4	21.0	0.0	-	-	-
Total %	4.0	27.4	4.0	0.0	-	35.4	2.7	23.7	2.1	0.0	-	28.5	6.1	11.2	2.1	0.3	-	19.7	1.6	11.4	3.5	0.0	-	16.5	-
PHF	0.625	0.858	0.469	0.000	-	0.899	0.833	0.856	0.400	0.000	-	0.836	0.719	0.750	0.667	0.250	-	0.881	0.750	0.672	0.650	0.000	-	0.816	0.887
Lights	12	95	13	0	-	120	7	85	5	0	-	97	21	19	4	1	-	45	4	17	12	0	-	33	295
% Lights	80.0	92.2	86.7	-	-	90.2	70.0	95.5	62.5	-	-	90.7	91.3	45.2	50.0	100.0	-	60.8	66.7	39.5	92.3	-	-	53.2	78.5
Mediums	0	4	1	0	-	5	0	3	2	0	-	5	1	4	1	0	-	6	2	3	1	0	-	6	22
% Mediums	0.0	3.9	6.7	-	-	3.8	0.0	3.4	25.0	-	-	4.7	4.3	9.5	12.5	0.0	-	8.1	33.3	7.0	7.7	-	-	9.7	5.9
Articulated Trucks	3	4	1	0	-	8	3	1	1	0	-	5	1	19	3	0	-	23	0	23	0	0	-	23	59
% Articulated Trucks	20.0	3.9	6.7	-	-	6.0	30.0	1.1	12.5	-	-	4.7	4.3	45.2	37.5	0.0	-	31.1	0.0	53.5	0.0	-	-	37.1	15.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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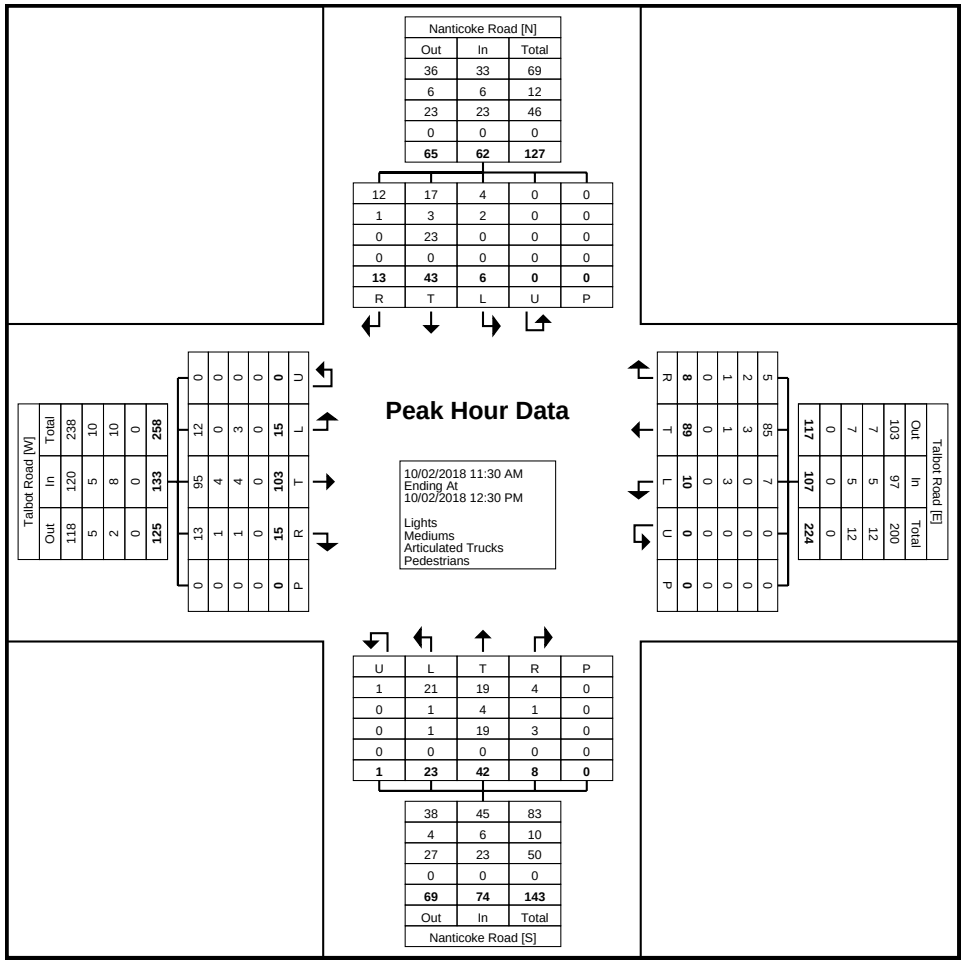
Start Date: 10/02/2018
Page No: 7



Turning Movement Peak Hour Data Plot (11:30 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 8

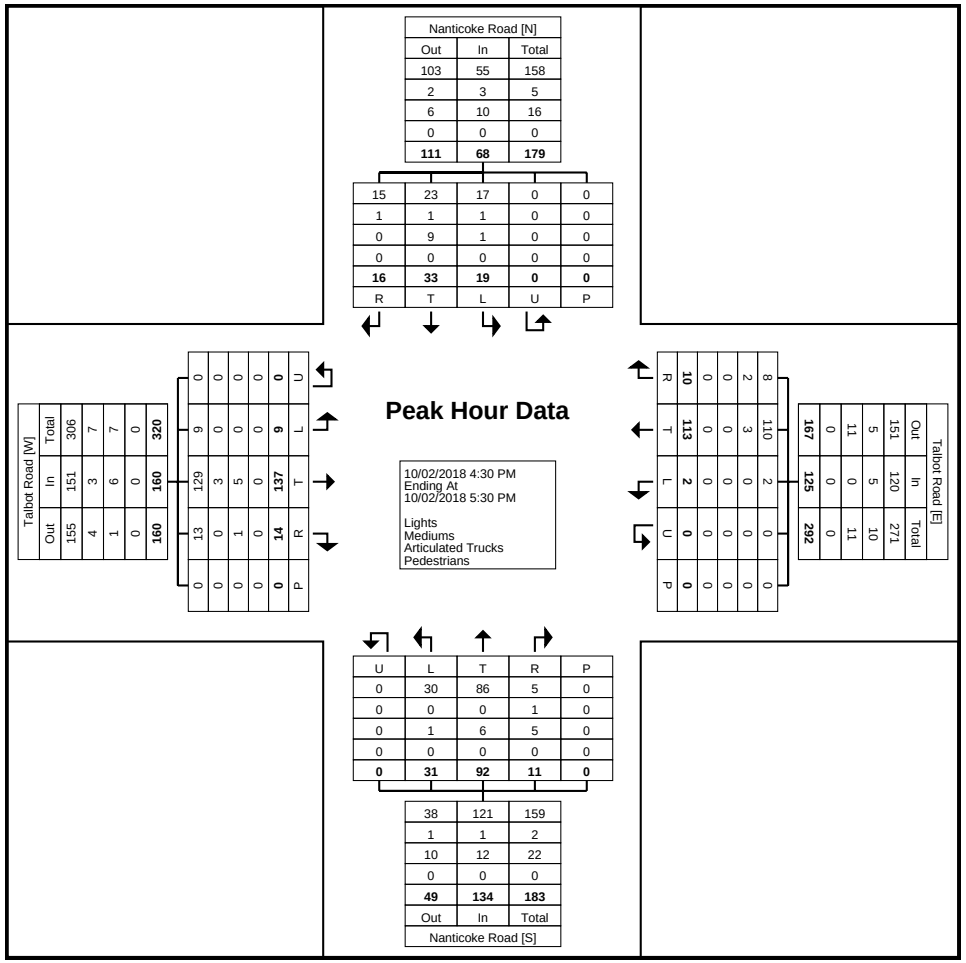
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Talbot Road Eastbound						Talbot Road Westbound						Nanticoke Road Northbound						Nanticoke Road Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	0	38	6	0	0	44	1	28	1	0	0	30	3	23	4	0	0	30	7	9	3	0	0	19	123
4:45 PM	2	42	2	0	0	46	1	29	2	0	0	32	6	7	1	0	0	14	4	5	5	0	0	14	106
5:00 PM	5	33	2	0	0	40	0	21	2	0	0	23	12	37	4	0	0	53	8	11	4	0	0	23	139
5:15 PM	2	24	4	0	0	30	0	35	5	0	0	40	10	25	2	0	0	37	0	8	4	0	0	12	119
Total	9	137	14	0	0	160	2	113	10	0	0	125	31	92	11	0	0	134	19	33	16	0	0	68	487
Approach %	5.6	85.6	8.8	0.0	-	-	1.6	90.4	8.0	0.0	-	-	23.1	68.7	8.2	0.0	-	-	27.9	48.5	23.5	0.0	-	-	-
Total %	1.8	28.1	2.9	0.0	-	32.9	0.4	23.2	2.1	0.0	-	25.7	6.4	18.9	2.3	0.0	-	27.5	3.9	6.8	3.3	0.0	-	14.0	-
PHF	0.450	0.815	0.583	0.000	-	0.870	0.500	0.807	0.500	0.000	-	0.781	0.646	0.622	0.688	0.000	-	0.632	0.594	0.750	0.800	0.000	-	0.739	0.876
Lights	9	129	13	0	-	151	2	110	8	0	-	120	30	86	5	0	-	121	17	23	15	0	-	55	447
% Lights	100.0	94.2	92.9	-	-	94.4	100.0	97.3	80.0	-	-	96.0	96.8	93.5	45.5	-	-	90.3	89.5	69.7	93.8	-	-	80.9	91.8
Mediums	0	3	0	0	-	3	0	3	2	0	-	5	0	0	1	0	-	1	1	1	1	0	-	3	12
% Mediums	0.0	2.2	0.0	-	-	1.9	0.0	2.7	20.0	-	-	4.0	0.0	0.0	9.1	-	-	0.7	5.3	3.0	6.3	-	-	4.4	2.5
Articulated Trucks	0	5	1	0	-	6	0	0	0	0	-	0	1	6	5	0	-	12	1	9	0	0	-	10	28
% Articulated Trucks	0.0	3.6	7.1	-	-	3.8	0.0	0.0	0.0	-	-	0.0	3.2	6.5	45.5	-	-	9.0	5.3	27.3	0.0	-	-	14.7	5.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 9



Turning Movement Peak Hour Data Plot (4:30 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Talbot Street (Hwy 3) & Hwy 55 (Nanticoke Road)
Site Code:
Start Date: 10/02/2018
Page No: 10

Cover Sheet

Location: Hwy 3 @ Haldiman-Norfolk 55 (Nanticoke)

Area/District:

Timing Based On T.M. Dated:

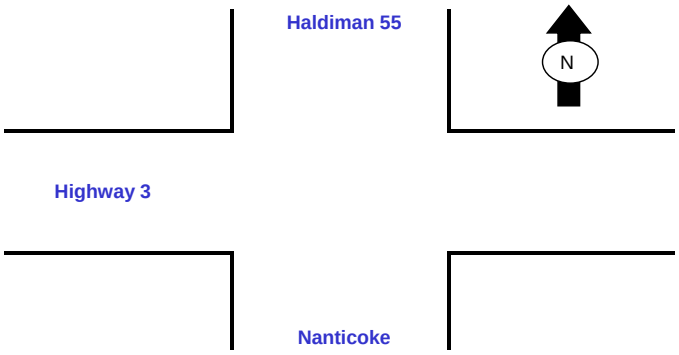
Traffic Signal : 60

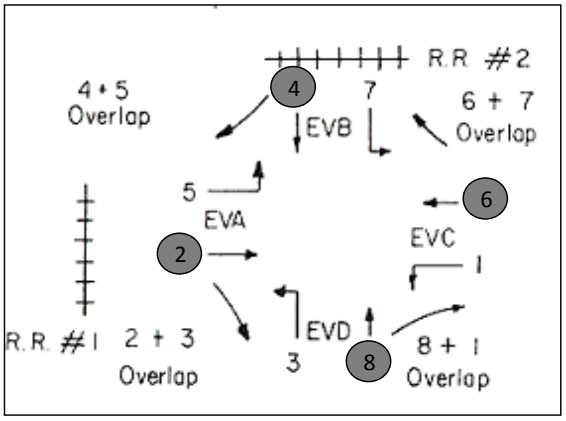
Timing Developed By: H Nichols

Approved By: K Plut

Installed By:

Installation Date: 25-Jan-17





Circle Movements and Operations

COMMUNICATIONS ADDRESSING

COMM ADDRESS
(C/0 + 0 + 0) = 1

CELL # :

ZONE ADDRESS
(C/0 + 0 + 1) = 1

UDP PORT:

AREA NUMBER
(C/0 + 0 + 2) = 1

IP ADDRESS:

AREA ADDRESS 60
(C/0 + 0 + 3) =

AMPIFIER:

PROGRAM: 233ON1.C

DISABLE ALARM REPORTING

Column F

		1	2	3	4	5	6	7	8
0	OMIT ALARMS					X			

< C + 0 + C = 5 >

1 = STOP TIME
2 = FLASH SENSE
3 = KEYBOARD ENTRY
4 = MANUAL PLAN SELECT
5 = ENABLE POLICE CNTRL (Not Used)
6 = EXTERNAL ALARM (Door Alarm)
7 = DETECTOR FAILURE

ACTUATED INTERVAL TIMING AND FAZE FUNCTIONS

		PHASE 1	2	3	4	5	6	7	8
0	WALK	-		-		-		-	
1	DON'T WALK	-		-		-		-	
2	MIN INITIAL		20		10		20		10
3	TYPE 3 LIMIT	-		-		-		-	
4	ADD PER VEH	-	1.9	-	1.9	-	1.9	-	1.9
5	VEH EXT		4.0		1.5		4.0		1.5
6	MAX GAP		4.0		1.5		4.0		1.5
7	MIN GAP		4.0		1.5		4.0		1.5
8	MAX LIMIT		50		40		50		40
9	MAXIMUM 2	-		-		-		-	
A	ADV /DLY WALK	-		-		-		-	
B	SEQUENCE TO	-		-		-		-	
C	COND SRV MIN	-		-		-		-	
D	REDUCE EVERY	-		-		-		-	
E	YELLOW		5.9		5.9		5.9		5.9
F	RED CLEAR		1.4		1.3		1.4		1.3

PHASE BANK # 1 < C + O + F = 1 >

		9	A	B	C	D		E
0							RR1 DLY	
1	PHASE 1	-					RR1 CLR	
2	PHASE 2	35					EVA DLY	
3	PHASE 3	-					EVA CLR	
4	PHASE 4	35					EVB DLY	
5	PHASE 5	-					EVB CLR	
6	PHASE 6	35					EVC DLY	
7	PHASE 7	-					EVC CLR	
8	PHASE 8	35					EVD DLY	
							EVD CLR	
		MAX INT	ALT WALK	ALT FLH D/W	ALT INT	ALT EXT	RR2 DLY	
							RR2 CLR	
	ALL RED START						EV CLR	
	(F/1 + C +O) =			5.0			EV DLY	
	RED REVERT						RR CLR	
	(F/1 + O + F) =			5.0			RR DLY	

COLUMN F PHASES

		1	2	3	4	5	6	7	8
0	PERMIT		X		X		X		X
1	RED LOCK								
2	YELLOW LOCK								
3	VEH MIN CALL		X				X		
4	PED RECALL								
5	PEDESTRIANS			View Only					
6	YIELD AT FLSH D/W								
7	RED REST								
8	DOUBLE ENTRY		X		X		X		X
9	VEH MAX CALL								
A	SOFT RECALL								
B	MAXIMUM 2								
C	COND SERVICE								
D	MAN CONT CALL								
E	YELLOW START		X				X		
F	FIRST PHASES				X				X

< C + O + F = 1 >

BI Tran Systems, Inc.
510 Bercut Dr., Sacramento, Calif. 95814
916/441-0260
*Traffic Signal Program **233** Ontario*
Timing Sheet #2

Date: 25-Jan-17

LOCATION

Hwy: Hwy 3
At:
Haldiman 55

		A	B	C
PREEMPT		RR1-2	SP	EMER
MINIMUMS		SPEV1	EV2	VEH
A	WLK (DFLT)	4	4	4
B	FD WALK			
C	INITAL			

< C + O + F = 1 >

Column E Phases / Bits

		1	2	3	4	5	6	7	8
0	EXCLUSIVE								
1	RR1 CLEAR								
2	RR2 CLEAR								
3	RR2 LTD SRV								
4	PROT/PERM								
5	FLH TO PREMT								
6	FLASH ENTRY								
7	DISABL MIN YEL								
8	DISABL OVP YEL								
9	OVP FLH YEL								
A	EM VEH A								
B	EM VEH B								
C	EM VEH C								
D	EM VEH D								
E	EXTRA 1	X		X		X			
F	IC SELECT		X						

Column F Phases / Bits

		1	2	3	4	5	6	7	8
0									
1	EXT PERMIT 1								
2	EXT PERMIT 2								
3	EXCLU PED								
4									
5	PED 2P OUT								
6	PED 6P OUT								
7	PED 4P OUT								
8	PED 8P OUT								
9	FLH YELLOW								
A									
B									
C									
D									
E	RESTRICTED								
F	EXTRA 2								

< C + O + E = 125 >

Column F Phases / Bits

		1	2	3	4	5	6	7	8
0	ADV GRN FLH								
1	PHASE FLASH								
2	FLASH WALK								
3	GUAR PASS								
4	SIMUL GAP		X		X		X		X
5	SEQ TIMING								
6	ADV WALK								
7	DELAY WALK								
8	EXT RECALL								
9									
A	MAX EXTEN								
B	INH PED RSRV								
C	SEMI ACTUATED								
D									
E	STRT VEH CALL		X		X		X		X
F	STRT PED CALL								

SPECIALS < C + O + F = 2 >

MANUAL PLAN	0
< C/0 + A + 1 >	
MANUAL OFFSET	0
< C/0 + B + 1 >	

MANUAL SELECTION

MANUAL PLAN
0 = Automatic (Master)
9 = Control Plan 1 - 9
14 (E) = Free (Isolated)
15 (F) = Software Flash

MANUAL OFFSET
0 = Automatic (Master)
1 = Offset A
2 = Offset B
3 = Offset C

FLASH TO PREEMPT

1 = EVA	5 = RR1
2 = EVB	6 = RR2
3 = EVC	7 = SE1
4 = EVD	8 = SE2

EXTRA 1

1 = TBC TYPE 1	5 = EXPANDED STATUS REPORTING
2 = NEMA EXT. COORD.	6 = INTERNATIONAL PED
3 = DAYLIGHT SAVINGS	7 = CLEAR OUTPUTS DURING FLASH
4 =	8 = SPLIT RING

EXTRA 2

1 = AWR ON DURING PHASE INITAL
2 = LMU INSTALLED

IC SELECT

2 = 2 WAY MODEM	5 = SIMPLEX MASTER
3 = 7 WIRE SLAVE	7 = 7 WIRE MASTER
4 = FLASH / FREE	8 = OFFSET INTURP

Pretimed

PHASE

	1	2	3	4	5	6	7	8
WALK	-		-		-		-	
DON'T WALK	-		-		-		-	
MIN INTIAL		20		10		20		10
TYPE 3 LIMIT	-		-		-		-	
ADD PER VEH	-	1.9	-	1.9	-	1.9	-	1.9
VEH EXT		4.0		1.5		4.0		1.5
MAX GAP		4.0		1.5		4.0		1.5
MIN GAP		4.0		1.5		4.0		1.5
MAX LIMIT		50		40		50		40
MAXIMUM 2	-		-		-		-	
ADV / DLY WALK	-		-		-		-	
SEQUENCE TO	-		-		-		-	
COND SRV MIN	-		-		-		-	
REDUCE EVERY	-		-		-		-	
YELLOW		5.9		5.9		5.9		5.9
RED CLEAR		1.4		1.3		1.4		1.3

PHASE BANK # < C + O + F = 1 >

Column F

PHASES

		1	2	3	4	5	6	7	8
0	PERMIT		X		X		X		X
1	RED LOCK								
2	YELLOW LOCK								
3	VEH MIN CALL		X				X		
4	PED RECALL								
5	PEDESTRIANS								
6	REST IN WALK								
7	RED REST								
8	DOUBLE ENTRY		X		X		X		X
9	VEH MAX CALL		X		X		X		X
A	SOFT RECALL								
B	MAXIMUM 2								
C	CORD SERVICE								
D	MAN CONT CALL								
E	YELLOW START		X				X		
F	FIRST PHASES				X				X

< C + O + F = 1 >

LOCATION: **Hwy 3 @ Haldiman-Norfolk 55 (Nanticoke)**

Issued Date: 25-Jan-17

Installed Date: 25-Jan-17

BI Tran Systems, Inc.
510 Bercut Dr., Sacremento, Calif. 95814
916/441-0260
Traffic Signal Program ***233*** *Ontario*
Timing Sheet #2
Revised (02/95)

Time of Day

Actuated

T.O.D FUNCTIONS

TIME HH MM	FUN	DAY OF WEEK S 1	M 2	T 3	W 4	T 5	F 6	S 7	Column 4 PHASE / BITS 1	2	3	4	5	6	7	8
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

< C + O + 7 = 1 > < C + O + E = 27 >

T.O.D FUNCTIONS

A = VEH SOFT RECALL
B = MAXIMUM 2
C = CONDITIONAL SERVICE
D = LAG PHASES
E= BIT 1- LOCAL OVERIDE
BIT 4- DISABLE DET OFF MONITOR
BIT 7- DET COUNT MONITOR
BIT 8- REAL TIME SPLIT MONITOR
F = OUTPUT BITS 1 THRU 4

0 = PERMIT PHASES
1 = RED LOCK
2 = YELLOW LOCK
3 = VEH MIN RECALL
4 = PED RECALL
5 -
6 - REST IN WALK
7 = RED REST
8 = DOUBLE ENTRY
9 = VEH MAX RECALL

LOCATION: **Hwy 3 @ Haldiman 55**

Issued Date: 17-Oct-14

Installed Date: 17-Oct-14

Pretimed

T.O.D FUNCTIONS

TIME HH MM	FUN	DAY OF WEEK S 1	M 2	T 3	W 4	T 5	F 6	S 7	Column 4 PHASE / BITS 1	2	3	4	5	6	7	8
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

< C + O + 7 = 1 > < C + O + E = 27 >

T.O.D FUNCTIONS

A = VEH SOFT RECALL
B = MAXIMUM 2
C = CONDITIONAL SERVICE
D = LAG PHASES
E = BIT 1- LOCAL OVERIDE
BIT 4- DISABLE DET OFF MONITOR
BIT 7- DET COUNT MONITOR
BIT 8- REAL TIME SPLIT MONITOR
F = OUTPUT BITS 1 THRU 4

0 = PERMIT PHASES
1 = RED LOCK
2 = YELLOW LOCK
3 = VEH MIN RECALL
4 = PED RECALL
5 -
6 - REST IN WALK
7 = RED REST
8 = DOUBLE ENTRY
9 = VEH MAX RECALL

LOCATION: **Hwy 3 @ Haldiman 55**

Issued Date: 17-Oct-14

Installed Date: 17-Oct-14

BI Tran Systems, Inc.
510 Bercut Dr., Sacremento, Calif. 95814
916/441-0260
Traffic Signal Program ***233*** *Ontario*
Timing Sheet #2
Revised (02/95)

DETECTOR ASSIGNMENTS

STANDARD 332 CABINET LOCATION	column	1	3
		delay	carry over
I-2 U	0		
J-2 U	1		
I-6 U	2	5	
J-6 U	3	5	
1-2 L	4		
J-2 L	5		
1-6 L	6	10	
J-6 L	7	5	
I-4	8		
J-4	9		
I-8	A		
J-8	B		4.5
J-1	C		
I-1	D		
J-5	E		
I-5	F		
	< C + O + D = 0 >		

Column 0		Column 1								Column 2								Column 3							
	C1 Pin #	ATTRIBUTES								PHASE(S)								ASSIGNMENTS							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
0	39				X	X					X							X	X	X					X
1	40				X	X									X			X	X	X					X
2	41					X		X					X					X	X	X					X
3	42					X		X									X	X	X	X					X
4	43																								
5	44																								
6	45					X		X					X					X	X	X					X
7	46					X		X									X	X	X	X					X
8	47																								
9	48																								
A	49																								
B	50				X	X											X	X	X	X					X
C	55																								
D	56																								
E	57																								
F	58																								

DETECTOR ASSIGNMENTS < C + O + E = 126>

STANDARD 332 CABINET LOCATION	column	2	4
		delay	carry over
J-9 U	0		
I-9 U	1		
I-9 L	2		
J-9 L	3		
I-3 U	4		
J-3 U	5		
I-7 U	6		4.5
J-7 U	7	5	
I-12 U	8		
I-13 U	9		
I-12 L	A		
I-13 L	B		
I-3 L	C		
J-3 L	D		
I-7 L	E		
J-7 L	F		
	< C + O + D = 0 >		

Column 4		Column 5								Column 6								Column 7							
	C1 Pin #	ATTRIBUTES								PHASE(S)								ASSIGNMENTS							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
0	59																								
1	60																								
2	61																								
3	62																								
4	63																								
5	64																								
6	65				X	X							X					X	X	X					X
7	66					X		X									X	X	X	X					X
8	67																								
9	68																								
A	69																								
B	70																								
C	76																								
D	77																								
E	78																								
F	79																								

DETECTOR ASSIGNMENTS < C + O + E = 126 >

DETECTOR ASSIGNMENT SHEET
ONTARIO 233 PROGRAM

LOCATION:

Hwy Hwy 3
at Haldiman 55 (Nanticoke)
Issued Date: 25-Jan-17
Installed Date: 25-Jan-17

DETECTOR ATTRIBUTES

1 = FULL TIME DELAY
2 = PEDESTRIAN CALL
3 =
4 = COUNT
5 = EXTENSION
6 = TYPE 3
7 = CALLING
8 = ALTERNATE

DETECTOR ASSIGNMENTS

1 = DET. SET # 1
2 = DET. SET # 2
3 = DET. SET # 3
4 =
5 =
6 = MIN RECALL ON FAILURE
7 = MAX RECALL ON FAILURE
8 - REPORT ON FAILURE

DETECTOR MONITOR

MAX OFF: D/0+0+1=120
MAX ON: D/0+0+2=60

ADVANCE WARNING BEACONS

SIGN #1 SIGN #2
PHASE NUMBER
(F/1+C+F)= (F/1+D+F)=
TIME BEFORE YELLOW
(F/1+C+E)= (F/1+D+E)=
OUTPUT PIN NUMBER
(E/127+E+8)= (E/127+E+9)=

Input File Layout

Input File Slot No. →	1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I" FILE	**1** Ext, Cnt, Call <C1-56>	**2** Ext, Cnt, Call <C1-39>	**2** Ext, Cnt, Call <C1-63>	**2** Type 3, Call <C1-47>	**3** Ext, Cnt, Call <C1-58>	**4** Ext, Cnt, Call <C1-41>	**4** Ext, Cnt, Call <C1-65>	**4** Type 3, Call <C1-49>	**1** Ext, Cnt, Call <C1-60>	NOT WIRED	Not Assigned <C1-80>	**2** Ped Call <C1-67>	**6** Ped Call <C1-68>	Flash Sense <C1-81>
		2 Ext, Cnt, Call <C1-43>	**2** Ext, Cnt, Call <C1-76>			**4** Ext, Cnt, Call <C1-45>	**4** Ext, Cnt, Call <C1-78>		**3** Ext, Cnt, Call <C1-62>		Not Assigned <C1-53>	**4** Ped Call <C1-69>	**8** Ped Call <C1-70>	Stop Time <C1-82>
"J" FILE	**5** Ext, Cnt, Call <C1-55>	**6** Ext, Cnt, Call <C1-40>	**6** Ext, Cnt, Call <C1-64>	**6** Type 3, Call <C1-48>	**7** Ext, Cnt, Call <C1-57>	**8** Ext, Cnt, Call <C1-42>	**8** Ext, Cnt, Call <C1-66>	**8** Type 3, Call <C1-50>	**5** Ext, Cnt, Call <C1-59>	NOT WIRED	Not Assigned <C1-54>	EV **A** Preempt <C1-71>	EV **B** Preempt <C1-72>	Railroad 1 <C1-51>
		6 Ext, Cnt, Call <C1-44>	**6** Ext, Cnt, Call <C1-77>			**8** Ext, Cnt, Call <C1-46>	**8** Ext, Cnt, Call <C1-79>		**7** Ext, Cnt, Call <C1-61>		Not Assigned <C1-75>	EV **C** Preempt <C1-73>	EV **D** Preempt <C1-74>	Railroad

DETECTOR TYPES

Ext = Extension Detector
Detector is only active during the Phase's GREEN Intervals (ie, will NOT *Call* the Phase)

Cnt = Count Detector
Used in computing "Added Initial"

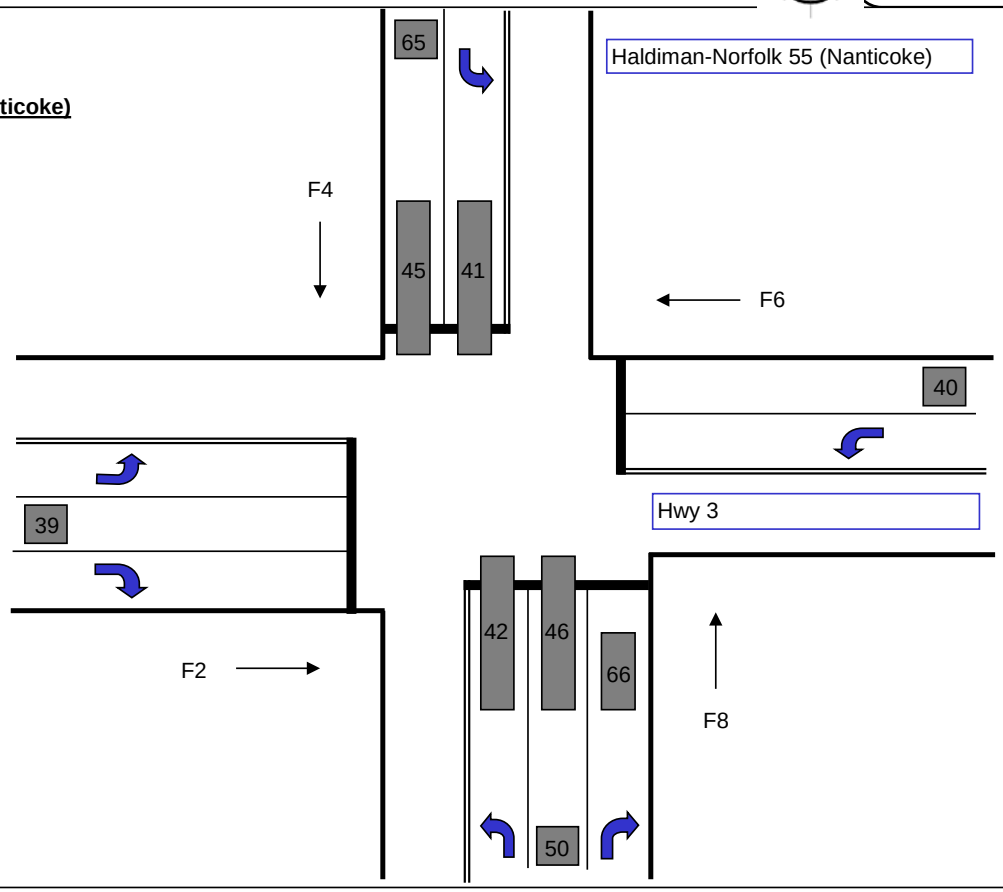
Call = Calling Detector
Detector is only active during the Phase's NON-GREEN Intervals (ie, will NOT *Extend* the Phase)

Type 3 = Type 3 Disconnect
Will allow a Calling Detector to Extend its Phase until the Call first drops or the "Type 3 Limit" is reached

BI Tran Systems, Inc.
510 Bercut Dr., Sacramento, Calif. 95814
916/441-0260
Traffic Signal Program 233
Initialized Detector Assignments
(Revised 8/92) 332 Cabinet

Intersection Of: **Hwy 3**

At: **Haldiman-Norfolk 55 (Nanticoke)**



DEFAULT DETECTOR ASSIGNMENTS

Standard 332 Cabinet Location	Column 0	C1 PIN NUMBER	Column 1 ATTRIBUTES 1	2	3	4	5	6	7	8	Column 2 PHASE(S) 1	2	3	4	5	6	7	8	Column 3 ASSIGNMENTS 1	2	3	4	5	6	7	8
I-2 U --->	0	39				X	X		X			X							X	X	X					X
J-2 U --->	1	40				X	X		X							X			X	X	X					X
I-6 U --->	2	41				X	X		X					X					X	X	X					X
J-6 U --->	3	42				X	X		X									X	X	X	X					X
I-2 L --->	4	43				X	X		X			X							X	X	X					X
J-2 L --->	5	44				X	X		X							X			X	X	X					X
I-6 L --->	6	45				X	X		X					X					X	X	X					X
J-6 L --->	7	46				X	X		X									X	X	X	X					X
I-4 --->	8	47						X	X			X							X	X	X					X
J-4 --->	9	48						X	X							X			X	X	X					X
I-8 --->	A	49						X	X					X					X	X	X					X
J-8 --->	B	50						X	X									X	X	X	X					X
J-1 --->	C	55				X	X		X						X				X	X	X					X
I-1 --->	D	56				X	X		X		X								X	X	X					X
J-5 --->	E	57				X	X		X								X		X	X	X					X
I-5 --->	F	58				X	X		X				X						X	X	X					X

"INITIALIZED" DETECTOR ASSIGNMENTS
< C + 0 + E = 126 >

Standard 332 Cabinet Location	Column 4	C1 PIN NUMBER	Column 5 ATTRIBUTES 1	2	3	4	5	6	7	8	Column 6 PHASE(S) 1	2	3	4	5	6	7	8	Column 7 ASSIGNMENTS 1	2	3	4	5	6	7	8
J-9 U --->	0	59				X	X		X						X				X	X	X					X
I-9 U --->	1	60				X	X		X		X								X	X	X					X
J-9 L --->	2	61				X	X		X								X		X	X	X					X
I-9 L --->	3	62				X	X		X				X						X	X	X					X
I-3 U --->	4	63				X	X		X			X							X	X	X					X
J-3 U --->	5	64				X	X		X							X			X	X	X					X
I-7 U --->	6	65				X	X		X						x				X	X	X					X
J-7 U --->	7	66				X	X		X									X	X	X	X					X
I-12 U --->	8	67		X								X							X	X	X					X
I-13 U --->	9	68		X												X			X	X	X					X
I-12 L --->	A	69		X											X				X	X	X					X
I-13 L --->	B	70		X														X	X	X	X					X
I-3 L --->	C	76				X	X		X			X							X	X	X					X
J-3 L --->	D	77				X	X		X							X			X	X	X					X
I-7 L --->	E	78				X	X		X						X				X	X	X					X
J-7 L --->	F	79				X	X		X									X		X	X					X

"INITIALIZED" DETECTOR ASSIGNMENTS
< C + 0 + E = 126 >

DETECTOR ATTRIBUTES

1= Full time Delay
2 = Pedestrian call
3 =
4 = Count
5 = Extention
6 = Type 3
7 = Calling
8 = Alternate

DETECTOR ASSIGNMENTS

1 = Det. Set #1
2 = Det. Set #2
3 = Det. Set #3
4 =
5 =
6 = MIN Recall On Failure
7 = MAX Recall On Failure
8 = Report On Failure

Input File --> 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14

"I" FILE	1 Ext, Cnt, Call <C1-56>	2 Ext, Cnt, Call <C1-39>	2 Ext, Cnt, Call <C1-63>	2 Type 3, Call <C1-47>	3 Ext, Cnt, Call <C1-58>	4 Ext, Cnt, Call <C1-41>	4 Ext, Cnt, Call <C1-65>	4 Type 3, Call <C1-49>	1 Ext, Cnt, Call <C1-60>	NOT WIRED	Not Assigned <C1-80>	2 Ped Call <C1-67>	6 Ped Call <C1-68>	Flash Sense <C1-81>
		2 Ext, Cnt, Call <C1-43>	2 Ext, Cnt, Call <C1-76>			4 Ext, Cnt, Call <C1-45>	4 Ext, Cnt, Call <C1-78>		3 Ext, Cnt,		Not Assigned <C1-53>	4 Ped Call <C1-69>	8 Ped Call	Stop Time <C1-82>
"J" FILE	5 Ext, Cnt, Call <C1-55>	6 Ext, Cnt, Call <C1-40>	6 Ext, Cnt, Call <C1-64>	6 Type 3, Call <C1-48>	7 Ext, Cnt, Call <C1-57>	8 Ext, Cnt, Call <C1-42>	8 Ext, Cnt, Call <C1-66>	8 Type 3, Call <C1-50>	5 Ext, Cnt, Call <C1-59>	NOT WIRED	Not Assigned <C1-54>	EV A Preempt <C1-71>	EV B Preempt <C1-72>	Railroad 1 <C1-51>
		6 Ext, Cnt, Call <C1-44>	6 Ext, Cnt, Call <C1-77>			8 Ext, Cnt, Call <C1-46>	8 Ext, Cnt, Call <C1-79>		7 Ext, Cnt, Call <C1-61>		Not Assigned <C1-75>	EV C Ped Call <C1-73>	EV D Preempt <C1-74>	Railroad 2 <C1-52>

DETECTOR TYPES

Ext = Extension Detector
Detector is only active during the Phase's GREEN Intervals (ie, will NOT *Call* the Phase)
Cnt = Count Detector
Used in computing "Added Initial"
Call = Calling Detector
Detector is only active during the Phase's NON-GREEN Intervals (ie, will NOT *Extend* the Phase)
Type 3 = Type 3 Disconnect
Will allow a Calling Detector to Extend its Phase until the Call first drops or the "Type 3 Limit" is reached

BI Tran Systems, Inc.
510 Bercut Dr., Sacramento, Calif. 95814
916/441-0260
Traffic Signal Program 233
Initialized Detector Assignments
(Revised 8/92) 332 Cabinet

REFERENCE SHEET

Controller Intervals

0 = Walk	8 = Red Rest
1 = FDW	9 = Preemption
2 = Min. Green	A = Stop Time
3 =	B = Red Revert
4= Var. Initial	C = Yellow-Gap Termination
5 = Extension	D = Yellow-Max. Termination
6 =	E = Yellow-Forceoff Termination
7 = Reduce Gap	F = Red Clearance

Continuous Memory Error Monitoring

The controller's RAM and EPROM memories are continuously checked for errors. If an erro is found, the intersection will go into FLASH (via Watch Dog Timer), and one of the following will be shown on the controller's display:

bAd A = An error was detected in the CPU's RAM, or a new program has been installed on the memory module. Often caused by a bad controller "gel-cell" battery.

bAd b = An error was detected in the memory module's RAM. Often caused by a bad "lithium" battery on the memory module.

bAd E = An error was detected in the 233 Program EPROM.

bAd F = An error was detected in the Z-RAM (Dallas chip) on the memory module.

412/C Memory Module
Lithium Battery Condition

To check the condition of the 3.6 volt Lithium Battery on the 412/C Memory Module:

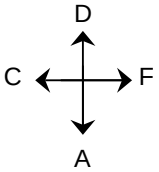
If E/112 + 0 + A = 84 - the battery is BAD
If E/112 + 0 + A = 85 - the battery is O.K.

Monitor "Activate" Flags

(Also Requires T.O.D. Function "E" Flag)
Detector Count Recording:
E/2 + 0 + 9 = Not Zero
Real Time Split Monitor:
E/2 + 0 + E = Not Zero

E Page Enable: F/1 + 9 + E = Not Zero

Display Movement Codes



A = Advance ROW
D = Decrement ROW
C = COLUMN Back
F = Forward COLUMN

Special Event Schedules

Special Event #1: C + 0 + E = 27
Special Event #2: C + 0 + E = 28

Current Interval = E + 5 + 0
Current Interval Timer = E + 5 + B
Current Interval Clearance Phases = E + 5 + C

Time of Day Function (7 Key)

Current T.O.D. "E Function" Control Bits = C/0 + E + E
Current T.O.D. "F Function" Output Bits = C/0 + E + F

Logic DELAY Gate
Delay Timer Display

DELAY A Timer = C/0 + 9 +A
DELAY B Timer = C/0 + 9 + B
thru thru
DELAY F Timer = C/0 + 9 + F

Interval Timer Display

Ring A = F/0 + A + Interval Row
Ring B = F/0 + B + (Interval Row From PHASE BANK data)

Display Locations

	Plan Select	Offset Select
Manual	= C/0 + A + 1	C/0 + B + 1
Master	= C/0 + A + 2	C/0 + B + 2
Current	= C/0 + A + 3	C/0 + B + 3
Next	= C/0 + A + 4	C/0 + B + 4
TOD	= C/0 + A +5	C/0 + B + 5

Master Cycle = C/0 + A + 0
Ring A Cycle = C/0 + B + 0
Ring B Cycle = C/0 + D + 0

MIN Cycle = C/0 + A + E
MAX Cycle = C/0 + B + E

Phase Hold = C/0 + F + D
Phase Next = C/0 + F + E
Force Off = C/0 + F + F
(with Ring A Cycle Timer)

Current Calculated Cycle Length = C/0 + B + F
Current Permitted Phases = E/0 + 7 +8
Current Phase Bank = F/0 + C + E

Last Power Failure:
(HR-MIN-DOW) = 8 + 4
(DOW-YR-MONTH) = 8 + 5
Last Cabinet Flash
(HR-MIN-DOW) = 8 + 6
(DOW-YR-MONTH) = 8 + 7
Power Fail Counts:
(Long Failures) = F/1 + 0 + C
(Short Failures) = F/1 + 0 + D
Current Time:
(HR-MIN-DOW) = 8 + 0
(DOW-YR-MONTH) = 8 + 1
(MIN-SEC-1/10SEC) = 8 + F

BI Tran Systems, Inc.
510 Bercut Dr., Sacramento, Calif. 95814
916/441-0260
Traffic Signal Program 233
"View" Locations
(Revised 03/94

Appendix B

Existing Traffic Operations Summary Reports

Lanes, Volumes, Timings
1: Highway 6 & Nanticoke Creek Parkway

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	11	30	4	14	1	28	266	14	0	182	62
Future Volume (vph)	42	11	30	4	14	1	28	266	14	0	182	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	120.0		120.0	90.0		90.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.994				0.850			0.850
Flt Protected		0.975			0.989		0.950					
Satd. Flow (prot)	0	1628	0	0	1695	0	1626	1845	1509	1900	1810	1524
Flt Permitted		0.975			0.989		0.950					
Satd. Flow (perm)	0	1628	0	0	1695	0	1626	1845	1509	1900	1810	1524
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		334.7			473.5			426.8			479.3	
Travel Time (s)		15.1			21.3			25.6			28.8	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	7%	27%	3%	0%	14%	0%	11%	3%	7%	0%	5%	6%
Adj. Flow (vph)	48	13	34	5	16	1	32	302	16	0	207	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	22	0	32	302	16	0	207	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			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 37.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Highway 6 & Nanticoke Creek Parkway

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	11	30	4	14	1	28	266	14	0	182	62
Future Volume (Veh/h)	42	11	30	4	14	1	28	266	14	0	182	62
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	48	13	34	5	16	1	32	302	16	0	207	70
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	582	589	207	614	643	302	277			318		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	582	589	207	614	643	302	277			318		
tC, single (s)	7.2	6.8	6.2	7.1	6.6	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.3	3.5	4.1	3.3	2.3			2.2		
p0 queue free %	88	97	96	99	96	100	97			100		
cM capacity (veh/h)	395	379	831	373	367	742	1236			1253		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	95	22	32	302	16	0	207	70
Volume Left	48	5	32	0	0	0	0	0
Volume Right	34	1	0	0	16	0	0	70
cSH	483	377	1236	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.06	0.03	0.18	0.01	0.00	0.12	0.04
Queue Length 95th (m)	5.8	1.5	0.6	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	14.3	15.1	8.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	C	A					
Approach Delay (s)	14.3	15.1	0.7			0.0		
Approach LOS	B	C						

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Main Street & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	64	0	24	97	20	8	133	32	19	72	114
Future Volume (vph)	89	64	0	24	97	20	8	133	32	19	72	114
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								1.00			0.99	
Frt					0.981			0.975			0.925	
Flt Protected		0.972			0.992			0.998			0.995	
Satd. Flow (prot)	0	1709	0	0	1567	0	0	1599	0	0	1485	0
Flt Permitted		0.768			0.942			0.986			0.968	
Satd. Flow (perm)	0	1350	0	0	1488	0	0	1580	0	0	1445	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					17			24			128	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		190.6			627.7			265.6			263.4	
Travel Time (s)		13.7			45.2			19.1			19.0	
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	11%	0%	4%	7%	5%	0%	4%	3%	5%	4%	5%
Parking (#/hr)					0			0			0	
Adj. Flow (vph)	100	72	0	27	109	22	9	149	36	21	81	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	172	0	0	158	0	0	194	0	0	230	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	1.14	1.00	1.00	1.14	1.00	1.00	1.14	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.5	30.5		30.5	30.5		30.5	30.5		30.5	30.5	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	

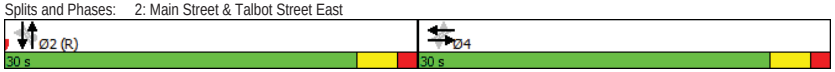
Lanes, Volumes, Timings
2: Main Street & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.30			0.25			0.28			0.33	
Control Delay		13.2			11.1			11.2			6.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.2			11.1			11.2			6.9	
LOS		B			B			B			A	
Approach Delay		13.2			11.1			11.2			6.9	
Approach LOS		B			B			B			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 45.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Main Street & Talbot Street East



Queues
2: Main Street & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	172	158	194	230
v/c Ratio	0.30	0.25	0.28	0.33
Control Delay	13.2	11.1	11.2	6.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.2	11.1	11.2	6.9
Queue Length 50th (m)	12.5	9.9	12.1	7.0
Queue Length 95th (m)	24.7	20.6	24.1	19.0
Internal Link Dist (m)	166.6	603.7	241.6	239.4
Turn Bay Length (m)				
Base Capacity (vph)	573	642	685	687
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.25	0.28	0.33

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Main Street & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	64	0	24	97	20	8	133	32	19	72	114
Future Volume (vph)	89	64	0	24	97	20	8	133	32	19	72	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.98			0.97			0.92	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1708			1566			1599			1486	
Flt Permitted		0.77			0.94			0.99			0.97	
Satd. Flow (perm)		1349			1488			1580			1445	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	100	72	0	27	109	22	9	149	36	21	81	128
RTOR Reduction (vph)	0	0	0	0	10	0	0	14	0	0	74	0
Lane Group Flow (vph)	0	172	0	0	148	0	0	180	0	0	156	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	6%	11%	0%	4%	7%	5%	0%	4%	3%	5%	4%	5%
Parking (#/hr)					0			0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		25.5			25.5			25.5			25.5	
Effective Green, g (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Lane Grp Cap (vph)		573			632			671			614	
v/s Ratio Prot												
v/s Ratio Perm		c0.13			0.10			c0.11			0.11	
v/c Ratio		0.30			0.23			0.27			0.25	
Uniform Delay, d1		11.4			11.0			11.2			11.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			0.9			1.0			1.0	
Delay (s)		12.7			11.9			12.2			12.1	
Level of Service		B			B			B			B	
Approach Delay (s)		12.7			11.9			12.2			12.1	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Talbot Street East & Craddock Blvd

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	123	151	7	9	13
Future Volume (vph)	7	123	151	7	9	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.918	
Flt Protected		0.997			0.981	
Satd. Flow (prot)	0	1715	1714	0	1508	0
Flt Permitted		0.997			0.981	
Satd. Flow (perm)	0	1715	1714	0	1508	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		627.7	323.8		121.4	
Travel Time (s)		45.2	23.3		8.7	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	11%	10%	14%	22%	8%
Adj. Flow (vph)	7	128	157	7	9	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	135	164	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Talbot Street East & Craddock Blvd

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	123	151	7	9	13
Future Volume (Veh/h)	7	123	151	7	9	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	7	128	157	7	9	14
Pedestrians					5	
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	169				308	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	169				308	166
tC, single (s)	4.1				6.6	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.4
p0 queue free %	100				99	98
cM capacity (veh/h)	1415				639	860

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	135	164	23
Volume Left	7	0	9
Volume Right	0	7	14
cSH	1415	1700	758
Volume to Capacity	0.00	0.10	0.03
Queue Length 95th (m)	0.1	0.0	0.8
Control Delay (s)	0.4	0.0	9.9
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	9.9
Approach LOS			A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Talbot Street East & Saunders Blvd

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	121	138	10	10	9
Future Volume (vph)	4	121	138	10	10	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.991		0.936	
Flt Protected		0.999			0.974	
Satd. Flow (prot)	0	1700	1697	0	1638	0
Flt Permitted		0.999			0.974	
Satd. Flow (perm)	0	1700	1697	0	1638	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		323.8	805.7		146.6	
Travel Time (s)		23.3	58.0		10.6	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	12%	11%	10%	11%	0%
Adj. Flow (vph)	4	132	150	11	11	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	136	161	0	21	0
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 19.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Talbot Street East & Saunders Blvd

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	121	138	10	10	9
Future Volume (Veh/h)	4	121	138	10	10	9
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)	4	132	150	11	11	10
Pedestrians					3	
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	164				298	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	164				298	158
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				98	99
cM capacity (veh/h)	1423				671	890

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	136	161	21
Volume Left	4	0	11
Volume Right	0	11	10
cSH	1423	1700	760
Volume to Capacity	0.00	0.09	0.03
Queue Length 95th (m)	0.1	0.0	0.7
Control Delay (s)	0.2	0.0	9.9
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.9
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	82	16	15	95	10	21	60	4	5	102	16
Future Volume (vph)	13	82	16	15	95	10	21	60	4	5	102	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		100.0	110.0		0.0	85.0		100.0	105.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.850		0.986				0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1727	1233	1504	1777	0	1641	1545	1615	1805	1661	0
Flt Permitted	0.680			0.696			0.671			0.712		
Satd. Flow (perm)	1292	1727	1233	1102	1777	0	1159	1545	1615	1353	1661	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51		8				52		10	
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		805.7			412.7			457.4			469.5	
Travel Time (s)		36.3			18.6			20.6			21.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	10%	31%	20%	6%	0%	10%	23%	0%	0%	14%	0%
Adj. Flow (vph)	15	94	18	17	109	11	24	69	5	6	117	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	94	18	17	120	0	24	69	5	6	135	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
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Minimum Split (s)	27.3	27.3	27.3	27.3	27.3		25.2	25.2	25.2	25.2	25.2	
Total Split (s)	50.0	50.0	50.0	50.0	50.0		40.0	40.0	40.0	40.0	40.0	
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%		44.4%	44.4%	44.4%	44.4%	44.4%	
Maximum Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9		5.9	5.9	5.9	5.9	5.9	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.3	1.3	1.3	1.3	1.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.02	0.11	0.03	0.03	0.14		0.06	0.12	0.01	0.01	0.22	
Control Delay	12.8	13.7	0.2	12.9	13.0		19.2	19.9	0.0	18.4	19.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

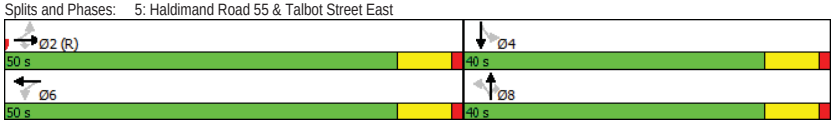
2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.8	13.7	0.2	12.9	13.0		19.2	19.9	0.0	18.4	19.5	
LOS	B	B	A	B	B		B	B	A	B	B	
Approach Delay		11.7			13.0			18.7			19.4	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.22
Intersection Signal Delay: 15.6 — Intersection LOS: B
Intersection Capacity Utilization 59.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Haldimand Road 55 & Talbot Street East



Queues
5: Haldimand Road 55 & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	15	94	18	17	120	24	69	5	6	135
v/c Ratio	0.02	0.11	0.03	0.03	0.14	0.06	0.12	0.01	0.01	0.22
Control Delay	12.8	13.7	0.2	12.9	13.0	19.2	19.9	0.0	18.4	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	13.7	0.2	12.9	13.0	19.2	19.9	0.0	18.4	19.5
Queue Length 50th (m)	1.4	9.2	0.0	1.6	11.0	2.8	8.2	0.0	0.7	15.4
Queue Length 95th (m)	4.6	17.3	0.3	5.0	20.3	7.8	16.8	0.0	3.1	27.9
Internal Link Dist (m)		781.7			388.7		433.4			445.5
Turn Bay Length (m)	85.0		100.0	110.0		85.0		100.0	105.0	
Base Capacity (vph)	612	819	611	522	847	422	563	621	493	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.11	0.03	0.03	0.14	0.06	0.12	0.01	0.01	0.22

Intersection Summary

HCM Signalized Intersection Capacity Analysis
5: Haldimand Road 55 & Talbot Street East

2018 Base Year: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	82	16	15	95	10	21	60	4	5	102	16
Future Volume (vph)	13	82	16	15	95	10	21	60	4	5	102	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1727	1233	1504	1777		1641	1545	1615	1805	1661	
Flt Permitted	0.68	1.00	1.00	0.70	1.00		0.67	1.00	1.00	0.71	1.00	
Satd. Flow (perm)	1292	1727	1233	1102	1777		1158	1545	1615	1353	1661	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	15	94	18	17	109	11	24	69	5	6	117	18
RTOR Reduction (vph)	0	0	9	0	4	0	0	0	3	0	6	0
Lane Group Flow (vph)	15	94	9	17	116	0	24	69	2	6	129	0
Heavy Vehicles (%)	0%	10%	31%	20%	6%	0%	10%	23%	0%	0%	14%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Effective Green, g (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Grp Cap (vph)	612	819	584	522	843		422	563	588	493	605	
v/s Ratio Prot		0.05			c0.07			0.04			c0.08	
v/s Ratio Perm	0.01		0.01	0.02			0.02		0.00	0.00		
v/c Ratio	0.02	0.11	0.01	0.03	0.14		0.06	0.12	0.00	0.01	0.21	
Uniform Delay, d1	12.6	13.1	12.5	12.6	13.3		18.6	19.0	18.2	18.3	19.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.3	0.0	0.1	0.3		0.3	0.4	0.0	0.0	0.8	
Delay (s)	12.6	13.4	12.6	12.7	13.6		18.8	19.5	18.2	18.3	20.5	
Level of Service	B	B	B	B	B		B	B	B	B	C	
Approach Delay (s)		13.2			13.5			19.2			20.4	
Approach LOS		B			B			B			C	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
1: Highway 6 & Nanticoke Creek Parkway

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	17	33	5	13	1	34	250	7	4	362	63
Future Volume (vph)	58	17	33	5	13	1	34	250	7	4	362	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	120.0		120.0	90.0		90.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.993				0.850			0.850
Flt Protected		0.974			0.988		0.950			0.950		
Satd. Flow (prot)	0	1723	0	0	1775	0	1752	1810	1417	1031	1863	1615
Flt Permitted		0.974			0.988		0.950			0.950		
Satd. Flow (perm)	0	1723	0	0	1775	0	1752	1810	1417	1031	1863	1615
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		334.7			473.5			426.8			479.3	
Travel Time (s)		15.1			21.3			25.6			28.8	
Confl. Peds. (#/hr)			3	3					3	3		
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 (%)	2%	6%	3%	0%	0%	100%	3%	5%	14%	75%	2%	0%
Adj. Flow (vph)	63	18	36	5	14	1	37	272	8	4	393	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	117	0	0	20	0	37	272	8	4	393	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			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	44.3%	ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Highway 6 & Nanticoke Creek Parkway

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	17	33	5	13	1	34	250	7	4	362	63
Future Volume (Veh/h)	58	17	33	5	13	1	34	250	7	4	362	63
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)	63	18	36	5	14	1	37	272	8	4	393	68
Pedestrians					3			3				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	755	758	396	798	818	275	461			283		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755	758	396	798	818	275	461			283		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	7.2	4.1			4.8		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	4.2	2.2			2.9		
p0 queue free %	79	94	94	98	95	100	97			100		
cM capacity (veh/h)	303	318	650	267	300	577	1095			953		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	117	20	37	272	8	4	393	68
Volume Left	63	5	37	0	0	4	0	0
Volume Right	36	1	0	0	8	0	0	68
cSH	366	298	1095	1700	1700	953	1700	1700
Volume to Capacity	0.32	0.07	0.03	0.16	0.00	0.00	0.23	0.04
Queue Length 95th (m)	10.8	1.7	0.8	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	19.4	17.9	8.4	0.0	0.0	8.8	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	19.4	17.9	1.0			0.1		
Approach LOS	C	C						

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Main Street & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	108	7	31	82	48	4	105	35	25	210	147
Future Volume (vph)	126	108	7	31	82	48	4	105	35	25	210	147
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		1.00			0.99			0.99			0.99	
Frt		0.996			0.960			0.967			0.948	
Flt Protected		0.974			0.990			0.999			0.997	
Satd. Flow (prot)	0	1753	0	0	1563	0	0	1584	0	0	1560	0
Flt Permitted		0.773			0.913			0.991			0.977	
Satd. Flow (perm)	0	1389	0	0	1441	0	0	1571	0	0	1528	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			44			33			65	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		190.6			627.7			265.6			263.4	
Travel Time (s)		13.7			45.2			19.1			19.0	
Confl. Peds. (#/hr)	4					4	6		5	5		6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	8%	0%	0%	4%	4%	0%	3%	6%	8%	3%	1%
Parking (#/hr)					0			0			0	
Adj. Flow (vph)	142	121	8	35	92	54	4	118	39	28	236	165
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	271	0	0	181	0	0	161	0	0	429	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	1.14	1.00	1.00	1.14	1.00	1.00	1.14	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.5	30.5		30.5	30.5		30.5	30.5		30.5	30.5	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	

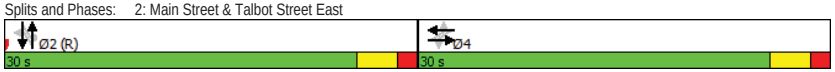
Lanes, Volumes, Timings
2: Main Street & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.46			0.28			0.23			0.63	
Control Delay		15.3			9.9			9.8			16.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.3			9.9			9.8			16.2	
LOS		B			A			A			B	
Approach Delay		15.3			9.9			9.8			16.2	
Approach LOS		B			A			A			B	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 69.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Main Street & Talbot Street East



Queues
2: Main Street & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	271	181	161	429
v/c Ratio	0.46	0.28	0.23	0.63
Control Delay	15.3	9.9	9.8	16.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.3	9.9	9.8	16.2
Queue Length 50th (m)	21.1	9.6	8.8	30.9
Queue Length 95th (m)	38.8	21.1	19.2	57.2
Internal Link Dist (m)	166.6	603.7	241.6	239.4
Turn Bay Length (m)				
Base Capacity (vph)	592	637	686	686
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.28	0.23	0.63

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Main Street & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	108	7	31	82	48	4	105	35	25	210	147
Future Volume (vph)	126	108	7	31	82	48	4	105	35	25	210	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.97			0.95	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1751			1563			1584			1559	
Flt Permitted		0.77			0.91			0.99			0.98	
Satd. Flow (perm)		1389			1440			1572			1527	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	142	121	8	35	92	54	4	118	39	28	236	165
RTOR Reduction (vph)	0	2	0	0	25	0	0	19	0	0	37	0
Lane Group Flow (vph)	0	269	0	0	156	0	0	142	0	0	392	0
Confl. Peds. (#/hr)	4					4	6		5	5		6
Heavy Vehicles (%)	3%	8%	0%	0%	4%	4%	0%	3%	6%	8%	3%	1%
Parking (#/hr)					0			0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		25.5			25.5			25.5			25.5	
Effective Green, g (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Lane Grp Cap (vph)		590			612			668			648	
v/s Ratio Prot												
v/s Ratio Perm		c0.19			0.11			0.09			c0.26	
v/c Ratio		0.46			0.25			0.21			0.60	
Uniform Delay, d1		12.3			11.1			10.9			13.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			1.0			0.7			4.1	
Delay (s)		14.8			12.1			11.6			17.5	
Level of Service		B			B			B			B	
Approach Delay (s)		14.8			12.1			11.6			17.5	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Talbot Street East & Craddock Blvd

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	161	164	13	4	8
Future Volume (vph)	20	161	164	13	4	8
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			0.990		0.913	
Flt Protected		0.994			0.982	
Satd. Flow (prot)	0	1793	1830	0	1564	0
Flt Permitted		0.994			0.982	
Satd. Flow (perm)	0	1793	1830	0	1564	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		627.7	323.8		121.4	
Travel Time (s)		45.2	23.3		8.7	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	3%	0%	25%	0%
Adj. Flow (vph)	23	183	186	15	5	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	206	201	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
3: Talbot Street East & Craddock Blvd

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	161	164	13	4	8
Future Volume (Veh/h)	20	161	164	13	4	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	23	183	186	15	5	9
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	201				422	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	201				422	194
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	98				99	99
cM capacity (veh/h)	1383				538	853

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	206	201	14
Volume Left	23	0	5
Volume Right	0	15	9
cSH	1383	1700	705
Volume to Capacity	0.02	0.12	0.02
Queue Length 95th (m)	0.4	0.0	0.5
Control Delay (s)	1.0	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Talbot Street East & Saunders Blvd

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	148	164	12	4	8
Future Volume (vph)	13	148	164	12	4	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.991		0.907	
Flt Protected		0.996			0.985	
Satd. Flow (prot)	0	1794	1832	0	1697	0
Flt Permitted		0.996			0.985	
Satd. Flow (perm)	0	1794	1832	0	1697	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		323.8	805.7		146.6	
Travel Time (s)		23.3	58.0		10.6	
Confl. Peds. (#/hr)	1			1	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	6%	3%	0%	0%	0%
Adj. Flow (vph)	14	157	174	13	4	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	171	187	0	13	0
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 28.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Talbot Street East & Saunders Blvd

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	148	164	12	4	8
Future Volume (Veh/h)	13	148	164	12	4	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	14	157	174	13	4	9
Pedestrians			1		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	188				368	182
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	188				368	182
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1397				629	866

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	171	187	13
Volume Left	14	0	4
Volume Right	0	13	9
cSH	1397	1700	776
Volume to Capacity	0.01	0.11	0.02
Queue Length 95th (m)	0.2	0.0	0.4
Control Delay (s)	0.7	0.0	9.7
Lane LOS	A		A
Approach Delay (s)	0.7	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	137	14	2	113	10	31	92	11	19	33	16
Future Volume (vph)	9	137	14	2	113	10	31	92	11	19	33	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		100.0	110.0		0.0	85.0		100.0	105.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.850		0.988				0.850		0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1792	1509	1805	1799	0	1752	1776	1042	1626	1479	0
Flt Permitted	0.668			0.658			0.720			0.689		
Satd. Flow (perm)	1269	1792	1509	1250	1799	0	1328	1776	1042	1179	1479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51		7				52		18	
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		805.7			412.7			457.4			469.5	
Travel Time (s)		36.3			18.6			20.6			21.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	7%	0%	3%	20%	3%	7%	55%	11%	30%	6%
Adj. Flow (vph)	10	156	16	2	128	11	35	105	13	22	38	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	156	16	2	139	0	35	105	13	22	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Minimum Split (s)	27.3	27.3	27.3	27.3	27.3		25.2	25.2	25.2	25.2	25.2	
Total Split (s)	50.0	50.0	50.0	50.0	50.0		40.0	40.0	40.0	40.0	40.0	
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%		44.4%	44.4%	44.4%	44.4%	44.4%	
Maximum Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9		5.9	5.9	5.9	5.9	5.9	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.3	1.3	1.3	1.3	1.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.02	0.18	0.02	0.00	0.16		0.07	0.16	0.03	0.05	0.10	
Control Delay	12.8	14.4	0.1	12.5	13.4		19.3	20.2	0.2	19.1	14.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

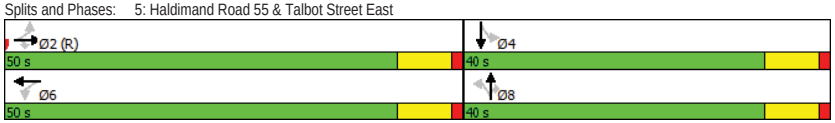
2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.8	14.4	0.1	12.5	13.4		19.3	20.2	0.2	19.1	14.7	
LOS	B	B	A	B	B		B	C	A	B	B	
Approach Delay		13.0			13.4			18.3			15.9	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.18
Intersection Signal Delay: 15.0 — Intersection LOS: B
Intersection Capacity Utilization 59.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Haldimand Road 55 & Talbot Street East



Queues
5: Haldimand Road 55 & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	156	16	2	139	35	105	13	22	56
v/c Ratio	0.02	0.18	0.02	0.00	0.16	0.07	0.16	0.03	0.05	0.10
Control Delay	12.8	14.4	0.1	12.5	13.4	19.3	20.2	0.2	19.1	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	14.4	0.1	12.5	13.4	19.3	20.2	0.2	19.1	14.7
Queue Length 50th (m)	0.9	15.7	0.0	0.2	13.1	4.1	12.7	0.0	2.6	4.4
Queue Length 95th (m)	3.6	26.9	0.0	1.4	23.5	10.4	23.8	0.0	7.5	12.2
Internal Link Dist (m)		781.7			388.7		433.4			445.5
Turn Bay Length (m)	85.0		100.0	110.0		85.0		100.0	105.0	
Base Capacity (vph)	602	850	742	593	857	483	647	412	429	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.18	0.02	0.00	0.16	0.07	0.16	0.03	0.05	0.10

Intersection Summary

HCM Signalized Intersection Capacity Analysis
5: Haldimand Road 55 & Talbot Street East

2018 Base Year: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	137	14	2	113	10	31	92	11	19	33	16
Future Volume (vph)	9	137	14	2	113	10	31	92	11	19	33	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1792	1509	1805	1799		1752	1776	1042	1626	1479	
Flt Permitted	0.67	1.00	1.00	0.66	1.00		0.72	1.00	1.00	0.69	1.00	
Satd. Flow (perm)	1270	1792	1509	1250	1799		1329	1776	1042	1180	1479	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	10	156	16	2	128	11	35	105	12	22	38	18
RTOR Reduction (vph)	0	0	8	0	4	0	0	0	8	0	11	0
Lane Group Flow (vph)	10	156	8	2	135	0	35	105	5	22	45	0
Heavy Vehicles (%)	0%	6%	7%	0%	3%	20%	3%	7%	55%	11%	30%	6%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Effective Green, g (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Grp Cap (vph)	602	850	715	593	853		484	647	379	430	539	
v/s Ratio Prot		c0.09			0.08			c0.06			0.03	
v/s Ratio Perm	0.01		0.01	0.00			0.03		0.00	0.02		
v/c Ratio	0.02	0.18	0.01	0.00	0.16		0.07	0.16	0.01	0.05	0.08	
Uniform Delay, d1	12.5	13.6	12.5	12.4	13.4		18.7	19.3	18.3	18.5	18.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.5	0.0	0.0	0.4		0.3	0.5	0.1	0.2	0.3	
Delay (s)	12.6	14.1	12.5	12.5	13.8		19.0	19.9	18.3	18.7	19.0	
Level of Service	B	B	B	B	B		B	B	B	B	B	
Approach Delay (s)		13.9			13.8			19.5			19.0	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix B

Work Package 2 – Growth Forecast and Future Needs

Issued: March 26, 2019
Revised: June 7, 2019

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Work Package 2 – Growth Forecast and Assessment of Future Needs

Jarvis Master Servicing Plan Update

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Table of Contents

1.0 INTRODUCTION 1
1.1 Project Overview 1
1.2 Objectives of the Master Plan 1
1.3 Study Area Overview 1
1.4 Previous Studies 3
2.0 CLASS ENVIRONMENTAL ASSESSMENT 4
2.1 Class Environmental Assessment and Master Planning Process 4
2.2 Problem Statement 4
2.3 Public Consultation Plan 5
3.0 FUTURE CONDITIONS 5
3.1 Population and Household Forecast 5
3.2 Design Criteria 8
4.0 WATER SERVICING 9
4.1 Water Distribution System 9
4.2 Future Modelled Water Demand 11
4.3 Future Storage Requirements 11
4.4 Future Existing Water Servicing Conditions and Constraints 13
5.0 WASTEWATER SERVICING 16
5.1 Wastewater Collection System 16
5.2 Future Modelled Wastewater Flows Collection System 18
5.3 Future Wastewater Servicing Conditions and Constraints 18
6.0 STORMWATER 20
6.1 Future Modelled Stormwater System 20
6.2 Future Stormwater Servicing Conditions and Constraints 22
7.0 TRANSPORTATION SERVICING 25
8.0 CONCLUSION 25
9.0 REFERENCES 26

List of Figures

Figure 1 Study Area Boundary and Designated Land Uses 2
Figure 2 Anticipated Development from 2018-2038 7
Figure 3 Future (2038) Future Water Distribution System 10
Figure 4 Future (2038) System Pressures Under Peak Hour Demand 14
Figure 5 Future (2038) Available Flow under Maximum Day Demand 15
Figure 6 Future (2038) Wastewater Collection System 17
Figure 7 Future (2038) Flow to Pipe Capacity Ratio 19
Figure 8 Future (2038) Stormwater Drainage System 21
Figure 9 Future (2038) Surcharge to Surface Map Under 5-Year 23
Figure 10 Future (2038) Flow to Pipe Capacity Ratio 24

List of Tables

Table 1 Jarvis Population and Household Projections 5
Table 2 Jarvis ICI Projections 6
Table 3 Allocation of Residential Growth 2018-2038 6
Table 4 Summary of Equivalent Population for Jarvis 8
Table 5 Design Criteria for Estimating Future Flows 8
Table 6 Summary of Modelled Water Demands (Future) 11
Table 7 Future Treated Water Storage Requirements 12
Table 8 Percentage of Junctions Capable of Meeting Fire Flow (2018) 13
Table 9 Summary of Modelled Wastewater Flow (Future) 18

List of Appendices

Appendix A – Water Model Parameters

Appendix B – Wastewater Model Parameters

Appendix C – Stormwater Model Parameters

Appendix D – Transportation Report

1.0 INTRODUCTION

1.1 Project Overview

The community of Jarvis is located approximately 15 kilometres north of Lake Erie in the western part of Haldimand County (the County) at the cross roads of Highway 7 and Highway 3. The community has a population of approximately 2,000 residents (Watson, 2018), and development is predominantly residential. Industrial, commercial, and institutional (ICI) development is concentrated in the north side of the community along Highway 6.

In 2010 the Jarvis Master Servicing Plan (MSP) for Water, Wastewater, Stormwater, and Transportation (Stantec, 2010) was completed. To support planned growth and intensification identified in the County's Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP). The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area, and identify updates to existing conditions and related assumptions based on growth that has since occurred.

1.2 Objectives of the Master Plan

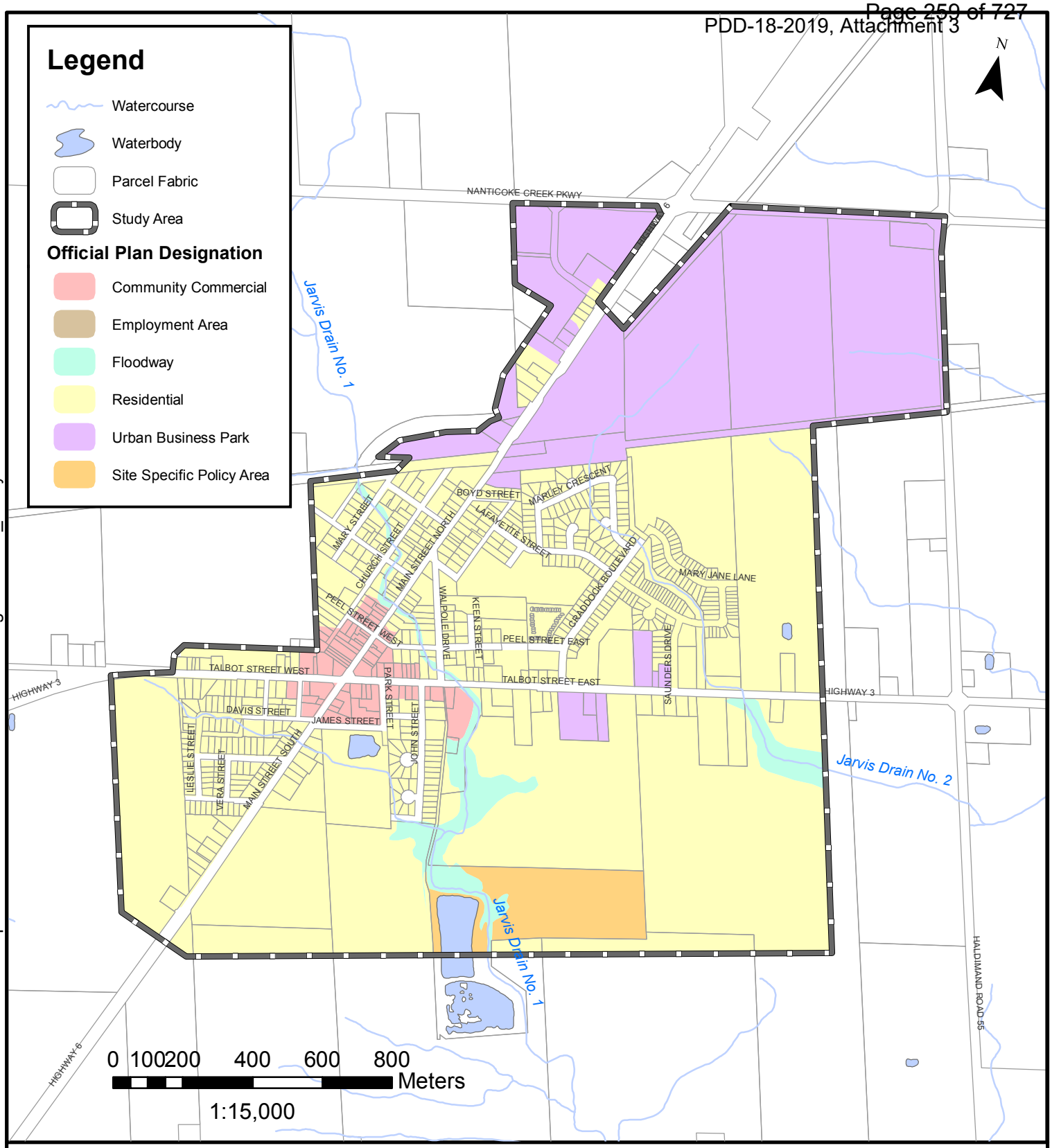
The Master Plan update will consider the findings from the 2010 MSP, as well as changes to the environment (as defined in the EA Act) and infrastructure since it was completed. Each component of the MSP update will be provided in the framework provided below:

- Work Package 1 – Background Review and Updates to Existing Conditions
- Work Package 2 – Growth Forecast and Assessment of Future Needs
- Work Package 3 – Development of Preferred Servicing Strategies
- Work Package 4 – Implementation Plan, Final Report and Presentation.

As well as updating the MSP, the County is concurrently conducting a Class EA to determine the preferred alternative to increase wastewater treatment capacity for Jarvis. The Class EA will be documented in a separate report.

1.3 Study Area Overview

The study area for the MSP update encompasses the urban boundary of Jarvis, consistent with the 2010 Jarvis MSP study area. Figure 1 illustrates the study area boundary. Municipal infrastructure in Jarvis includes a municipal water and wastewater system, stormwater infrastructure, and a transportation network.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

STUDY AREA BOUNDARY AND DESIGNATED LAND USES

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JLR #:	28176

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FIGURE 1

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_StudyArea.mxd

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Community water is supplied via a transmission main from the Nanticoke Water Treatment Plant (WTP) and stored in a shared elevated tank north of Townsend. Wastewater in Jarvis is conveyed to the Jarvis wastewater treatment lagoons which are owned and operated by the County. The storm system in Jarvis generally consists of traditional stormwater management infrastructure (e.g. ditches, urban curb and gutter networks) and two (2) stormwater management (SWM) facilities. The community of Jarvis is built adjacent to Highway 6 (Main Street) and Highway 3 (Talbot Street). Both those highways are “connecting links” in the Provincial highway network.

1.4 Previous Studies

In 2010, a Master Servicing Plan (MSP) was prepared (Stantec, 2010) to help guide the development of water, wastewater, storm and transportation services with respect to the County’s Official Plan to accommodate future development. Further details of the report findings are discussed in Work Package 1.

In addition to the 2010 MSP referenced throughout this report, the following studies related to water, wastewater, stormwater, and transportation infrastructure in Jarvis are referenced in the preparation of this Master Servicing Plan Update.

2010 MSP – present

Haldimand County Services and Planning Division. *Design Criteria*, Version 4.0, April 2015.

Ministry of Municipal Affairs and Housing. Ontario Government, *Provincial Policy Statement, 2014*, Section 3 Planning Act, 30 April 2014.

Haldimand County Planning & Economic Development Department. *The Haldimand County Official Plan*, Council adopted 26 June 2006, Ministry approved 8 June 2009.

Lake Erie Region Source Protection Committee. Long Point Region Source Protection Area Approved Source Protection Plan, Under Clean Water Act 2006, 4 November 2015.

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update*, 2016-2046 - Preliminary Draft Findings. October 2018.

Upper Canada Consultants. *Topographic Volumetric Survey of Jarvis Sewage Lagoons*, 17 July 2018.

Dave Chapman (CPO Inc.). *Jarvis lagoons: Capacity Assessment & Contingency and Abatement Plan Technical Memo,* 6 June 2011.

CPO Inc. and Haldimand County. *Jarvis lagoon Effluent Phosphorous Offsetting,* 20 July 2016.

Stantec Consulting Ltd. *Jarvis Master Servicing Plan Water, Wastewater, Stormwater, and Transportation*, September 2010.

Prior to 2010 MSP

Stantec Consulting Ltd. *Jarvis Inflow and Infiltration Study*, March 2010.

2.0 CLASS ENVIRONMENTAL ASSESSMENT

2.1 Class Environmental Assessment and Master Planning Process

The Ontario Environmental Assessment Act (Act) sets out a planning and decision-making process to consider potential environmental effects before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. In 1987, the first Class EA document prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011 and 2015.

This Master Servicing Plan Update is being completed with sufficient detail to fulfil the requirements for Schedule B projects (Approach #2) concurrently with a Class Environmental Assessment, for additional wastewater treatment capacity at the Jarvis Wastewater Treatment Lagoons.

Projects categorized as Schedule B or Schedule C undertakings have the potential for significant environmental impacts, and are required to follow specific phases under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project, and the preparation of a Class EA Project File or Environmental Study Report that documents the Class EA process.

For the Master Servicing Plan Update, a Project File or Environmental Study Report shall be made available for public and agency review at the completion of the Class EA process for a mandatory 30-day period. If there are no requests to the Minister of the Environment, Conservation and Parks (MECP) for a ‘Part II Order’ within the review period, then the project may proceed to implementation (Phase 5).

2.2 Problem Statement

To support planned growth and intensification identified in the County’s Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP) The purpose of the Master Servicing Plan Update is to evaluate the community’s long-term infrastructure needs and identify a preferred solution to be implemented to match growth in Jarvis over the next 20 years.

The Class EA framework will enable consideration of options and identify a preferred solution that is environmentally, socially, and financially responsible and sustainable.

The study will consider the needs and viewpoints of all participating stakeholders including, but not limited to, residents, government agencies, the general population, and Indigenous communities.

2.3 Public Consultation Plan

Public and agency consultation for this assignment is anticipated to consist of:

- Notice of Commencement
- Meetings with Review Agencies (as required)
- Project Committee Meetings
- Public Information Centre(s)
- Filing of the Project File/ESR and Notice of Completion

Consultation activities undertaken as part of the MSP Update will be documented in subsequent Work Packages.

3.0 FUTURE CONDITIONS

3.1 Population and Household Forecast

3.1.1 Residential Growth Projections

Watson & Associates Economists Limited is currently completing an update for the Halidmand County Population, Housing, and Employment Projections Study for 2016 to 2046 (Watson, 2018). Population and household growth projections for Jarvis were estimated using preliminary findings from the study. A summary of population and growth projections for 2018 to 2038 included in Table 1.

Table 1 Jarvis Population and Household Projections

Year	Population Include Undercount	Population Exclude Undercount	Households
2018	2000	2000	752
2023	2040	2000	782
2028	2140	2080	824
2033	2240	2240	880
2038	2340	2340	930

Based on the Watson 2018 Study, the anticipated population and household growth for the 20-year horizon from 2018 to 2038 is an increase of 340 persons and 178 units respectively.

3.1.2 ICI Growth Projections

Industrial, Commercial, and Institutional (ICI) Projections were obtained from Haldimand County Development Charge Background Study (Watson, 2014). Growth projections were provided in gross floor area (GFA) square feet (S.F) and converted to hectares of developed land. Actual development coverage assumed to be 75% of vacant land for industrial, commercial and institutional land uses. Summary of ICI growth projections for 2018 to 2038 is provided in Table 2.

Table 2 Jarvis ICI Projections

	Industrial GFA S.F	Commercial GFA S.F	Institutional GFA S.F	Total ICI
Mid 2018 – Mid 2038 (1)	219,700	7,700	7,700	235,100
Hectares (2)	2.72	0.10	0.10	2.91

Table 2 Notes:

1. Data from Development Charge Background Study provided for Mid 2014 to Mid 2034 assumed growth in same order of magnitude for timeframe of Mid 2018 to Mid 2038 (Watson, 2014).

2. Hectares of developed land assuming actual development coverage of 75%.

Anticipated ICI growth is approximately 2.72 ha of industrial land, 0.10 ha of commercial land and 0.10 ha of institutional land. Total ICI growth for the 20-year horizon from 2018 to 2038 is 2.91 ha of land.

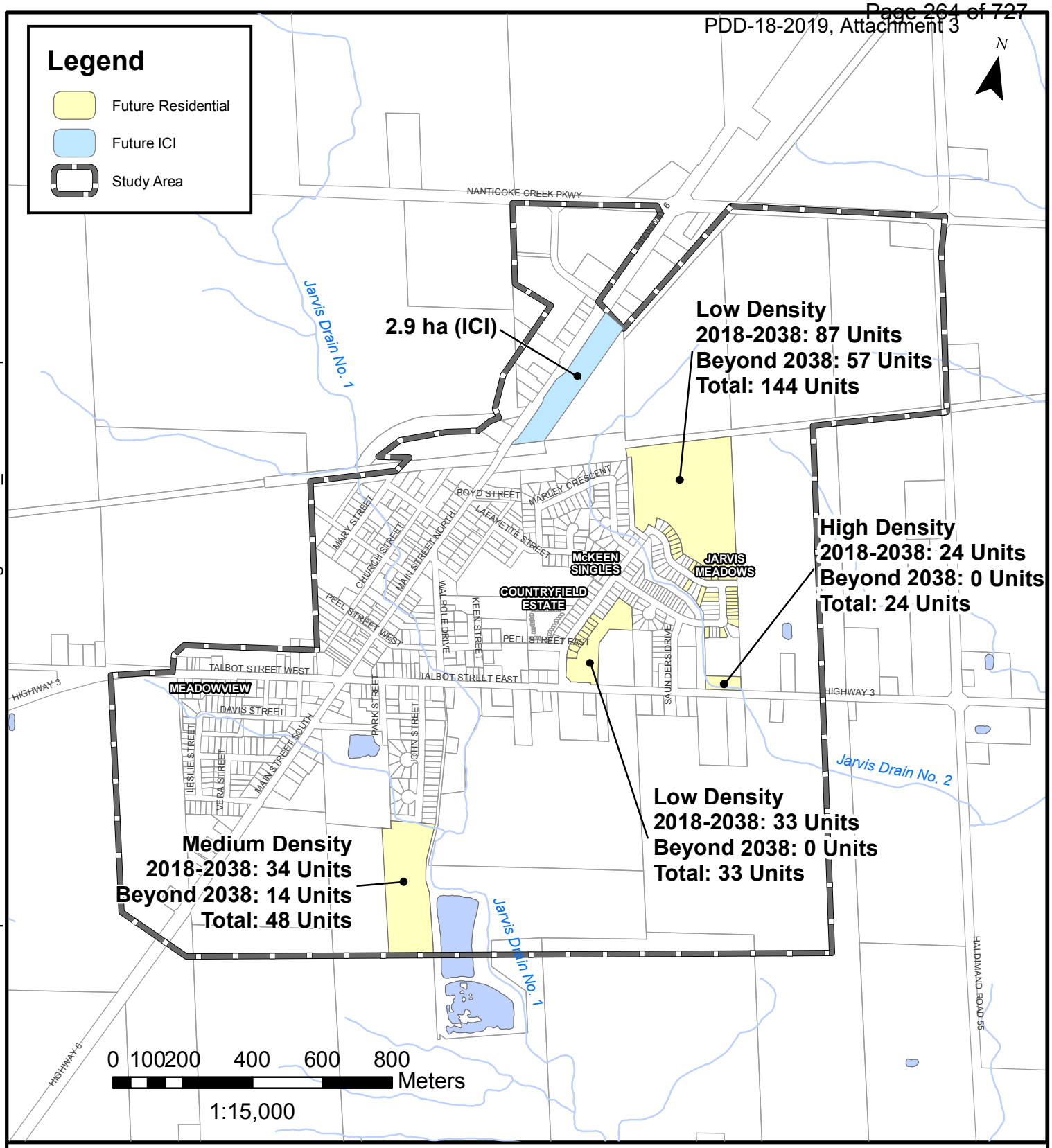
3.1.3 Distribution of Growth

Future residential growth was distributed based on approved development in Jarvis and residential density. Summarized in Table 3 is the allocation of residential growth.

Table 3 Allocation of Residential Growth 2018-2038

Development	Density	Units Available	Units Allocated	Ha
Jarvis Meadows Phase 2 & Phase 3 (L. McKeen)	Low	154	87	4.74
Saunders Drive	High	Not specified	24	0.35
Milmont Estates (D. Gusenbauer)	Medium	48	34	1.85
Country Fields Phase 1 and Phase 2 (C. Walker)	Low	33	33	1.8

Anticipated growth in Jarvis is approximately 6.54 ha (120 units) of low density residential land, 1.85 ha (34 units) of medium density residential land, 0.35 ha (24 units) of high density residential land and 2.91 ha of ICI land to be developed. See Figure 2 for the distribution of future residential and ICI development from 2018-2038.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

ANTICIPATED DEVELOPMENT FROM 2018 TO 2038

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FIGURE 2

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3.1.4 Equivalent Population

The following assumptions updated from 2010 MSP based on Haldimand County Design Criteria Version 4.0, April 2015 and input from County staff were used to calculate equivalent population.

- Low/medium density housing equivalent population of 55 persons/ha.
- High density housing equivalent population of 135 persons/ha.
- Commercial equivalent population of 90 persons/ha.
- Actual development coverage to be 75% of vacant land for industrial, commercial, and institutional land uses.

Anticipated growth in Jarvis is approximately 6.54 ha (120 units) of low density residential land, 1.85 ha (34 units) of medium density residential land, 0.35 ha (24 units) of high density residential land and 2.91 ha of ICI land to be developed. A summary of future equivalent population is provided in Table 4.

Table 4 Summary of Equivalent Population for Jarvis

Year(s)	Equivalent Population
Total 2017 (1)	2560
2018-2038 Residential Growth	510
2018-2038 ICI Growth	262
Total Growth	772
Total Future	3332

Table 4 Notes:

1. From Work Package 1.

3.2 Design Criteria

3.2.1 Future Flow Rates

Design criteria from Haldimand County Design Criteria Version 4.0, April 2015 along with input from County staff was used to develop design criteria for water and wastewater flows. These criteria are summarized in Table 5 below.

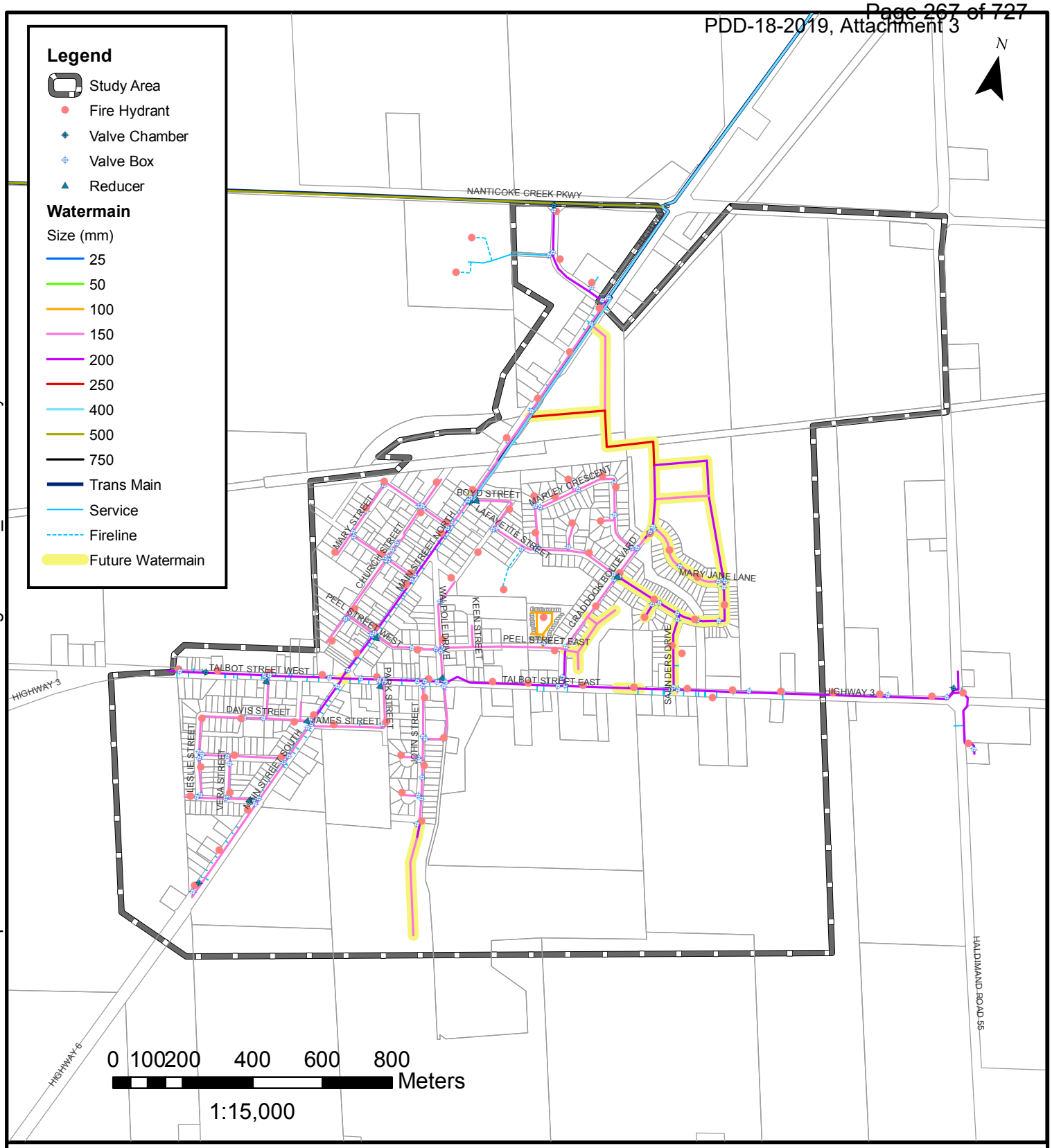
Table 5 Design Criteria for Estimating Future Flows

Parameter	Criteria
Average Water Consumption	290 L/capita/day
Dry Weather Average Sewage	280 L/capita/day
Infiltration Flow (Allowance)	0.23 L/s/ha
Peaking Factor	Harmon Formula

4.0 WATER SERVICING

4.1 Water Distribution System

The water model was updated to include future population growth to 2038. The extended future water distribution system is shown in Figure 3. Future watermain extensions are highlighted in yellow. All model inputs can be found in Appendix A.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

FUTURE (2038) WATER DISTRIBUTION SYSTEM

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FIGURE 3

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_FutureWaterSys.mxd

Plot Date: March 21, 2019 1:38:09 PM

4.2 Future Modelled Water Demand

The future water demands were calculated using a uniform per capita demand and the equivalent population. To add water demand to future development lands, the equivalent population for anticipated residential and ICI growth was calculated as detailed in Section 3.1.4. Once equivalent populations for future development was established, the total future flow was determined as follows:

- Average water consumption of 290 L/capita/day
- Maximum day factor of 2.0
- Peak hour demand factor of 3.0

This new demand was added to the existing conditions water demand developed in Work Package 1. Future water demands are summarized in Table 6.

Table 6 Summary of Modelled Water Demands (Future)

Land Use	Average Day (L/s)	Maximum Day (L/s)	Peak Hour (L/s)
Total 2017 Water Demand (1)	7.89	16.77	27.61
Additional Water Depot (2)	0	0	0
Additional Residential to 2038	1.78	3.56	5.34
Additional ICI to 2038	0.88	1.76	2.64
Total 2038 Water Demand	**10.55**	**22.09**	**35.59**

Table 6 Notes:

1. Refer to Work Package 1 for development of total existing water demand.
2. No anticipated increase in water demand for the Water Depot.

The future average, maximum, and peak water demands are estimated to be 10.55 L/s, 22.09 L/s and 35.59 L/s, respectively.

4.3 Future Storage Requirements

An elevated storage tank located at the north-east of Townsend provides storage for both Jarvis and Townsend. The storage volume provided by the tank is 2,300 m^3. Storage requirements were calculated based on the MECP (formally MOE) Design Guidelines for Drinking-Water Systems (2008), with fire storage requirements modified to assume that 50% of fire flow volume is pumped and the remainder is from storage. Using this approach adopted by Haldimand County there is adequate storage to serve anticipated 20-year growth. Table 7 summarizes the future total water storage volume required for Jarvis, Townsend, and for the overall system.

Table 7 Future Treated Water Storage Requirements

Area	Maximum Daily Demand (m^3/day)	Average Day Demand (m^3/day)	Equivalent Population 2038	Fire Storage Volume Required (m^3) A	Equalization Storage (m^3) B	Emergency Storage (m^3) C	Total Water Storage Volume Required (m^3) A+B+C
Jarvis	1,908 (1)	912 (1)	3,332	414	477	223	1,114
Townsend	696 (3)	348 (2)	1,200 (4)	252	174	107	533
Total	2,604	1,260	4,532	666	651	329	1,646

Table 7 Notes:

1. Refer to Table 6 for development of Jarvis maximum daily and average day demand.
2. Calculated Average Daily Demand using the equivalent population and per capita water consumption of 290 L/day per capita to reflect anticipated future growth for Townsend.
3. Calculated maximum daily demand using maximum day factor of 2.0.
4. Townsend equivalent population from preliminary findings of Watson & Associates Economists Limited update for the Halidmand County Population, Housing and Employment Projections Study for 2016 to 2046 (Watson, 2018).

The existing storage capacity of the elevated storage tower is 2,300 m^3 and the future storage capacity required is 1,646 m^3.The existing storage capacity provided is sufficient for the future total required storage with available surplus.

4.4 Future Existing Water Servicing Conditions and Constraints

4.4.1 Service Pressure

No future service pressure deficiencies were identified in Jarvis. Modeling results indicate that the system currently operates within the MECP recommended pressure range of 275 kPa to 550 kPa during the peak hour demand scenario. Existing system pressures are shown in Figure 4.

4.4.2 Available Fire Flow

Future fire flow availability within Jarvis was found to range between 40 L/s and 285 L/s during the maximum day demand scenario. Areas with low available fire flow are at the extremities (dead-ends) of the system, and include the Water Depot, located at 1342 Nanticoke Rd., Jarvis.

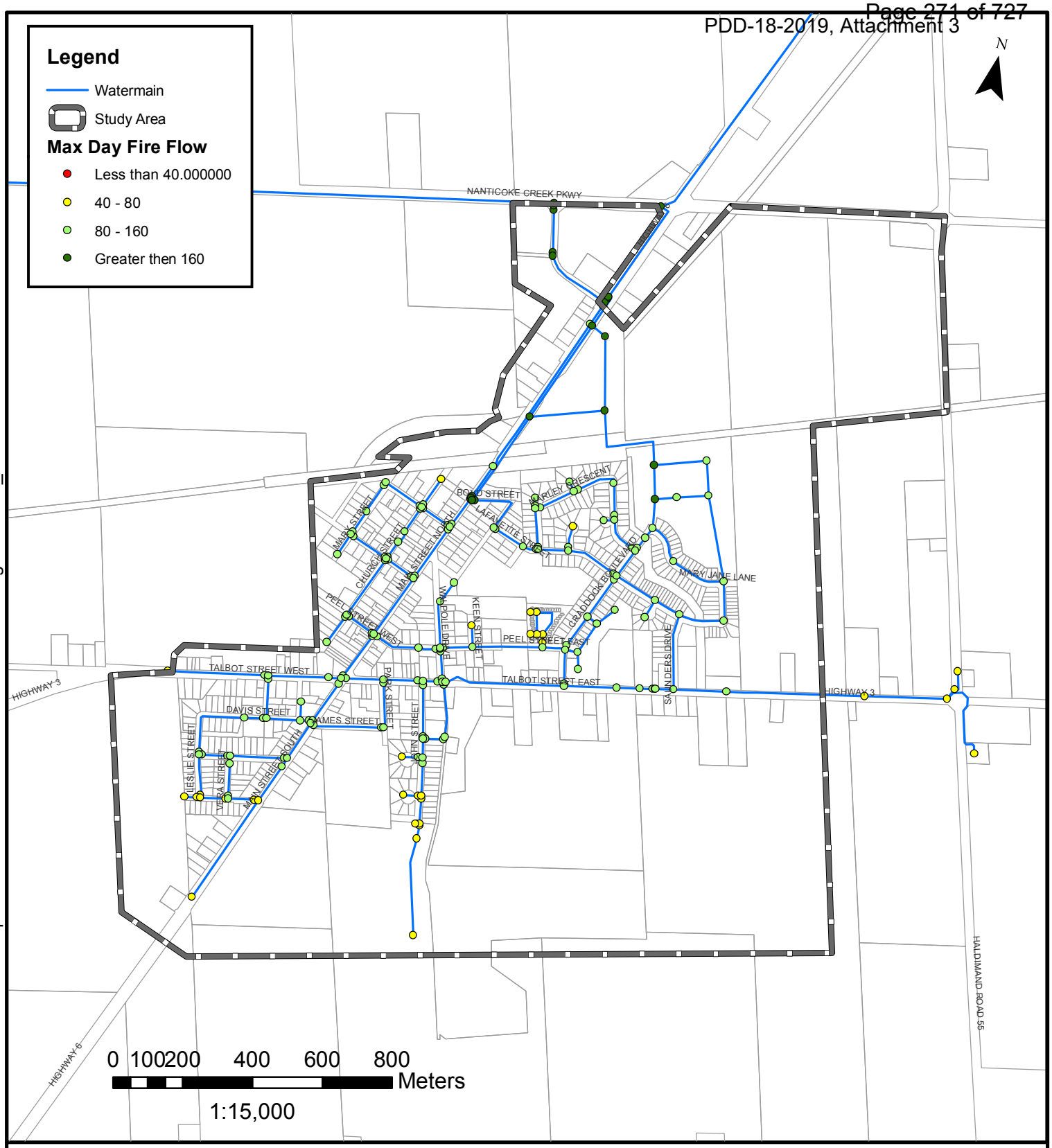
Table 8 presents a baseline for the percentage of junctions in the water model which are capable of meeting the indicated fire flow under existing conditions. Fire flow availability from the existing water distribution system is shown in Figure 5.

The County is currently developing design criteria for minimum fire flow requirements for new developments. It is anticipated that that the minimum flow permitted will be approximately 160 L/s from two adjacent hydrants (approximately 80L/s from one hydrant).

Approximately 80% of junctions are capable of meeting the proposed requirement of 80 L/s under future conditions.

Table 8 Percentage of Junctions Capable of Meeting Fire Flow (2018)

20 YEAR - Max Day + Fire Flow	
Fire Flow (L/s)	**Percentage (%) of Junctions Capable of Meeting the Fire Flow Indicated**
60	91.7%
80	83.3%
100	65.7%
150	14.2%
200	8.3%
250	3.9%



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

FUTURE (2038) AVAILABLE FIRE FLOW UNDER MAXIMUM DAY DEMAND

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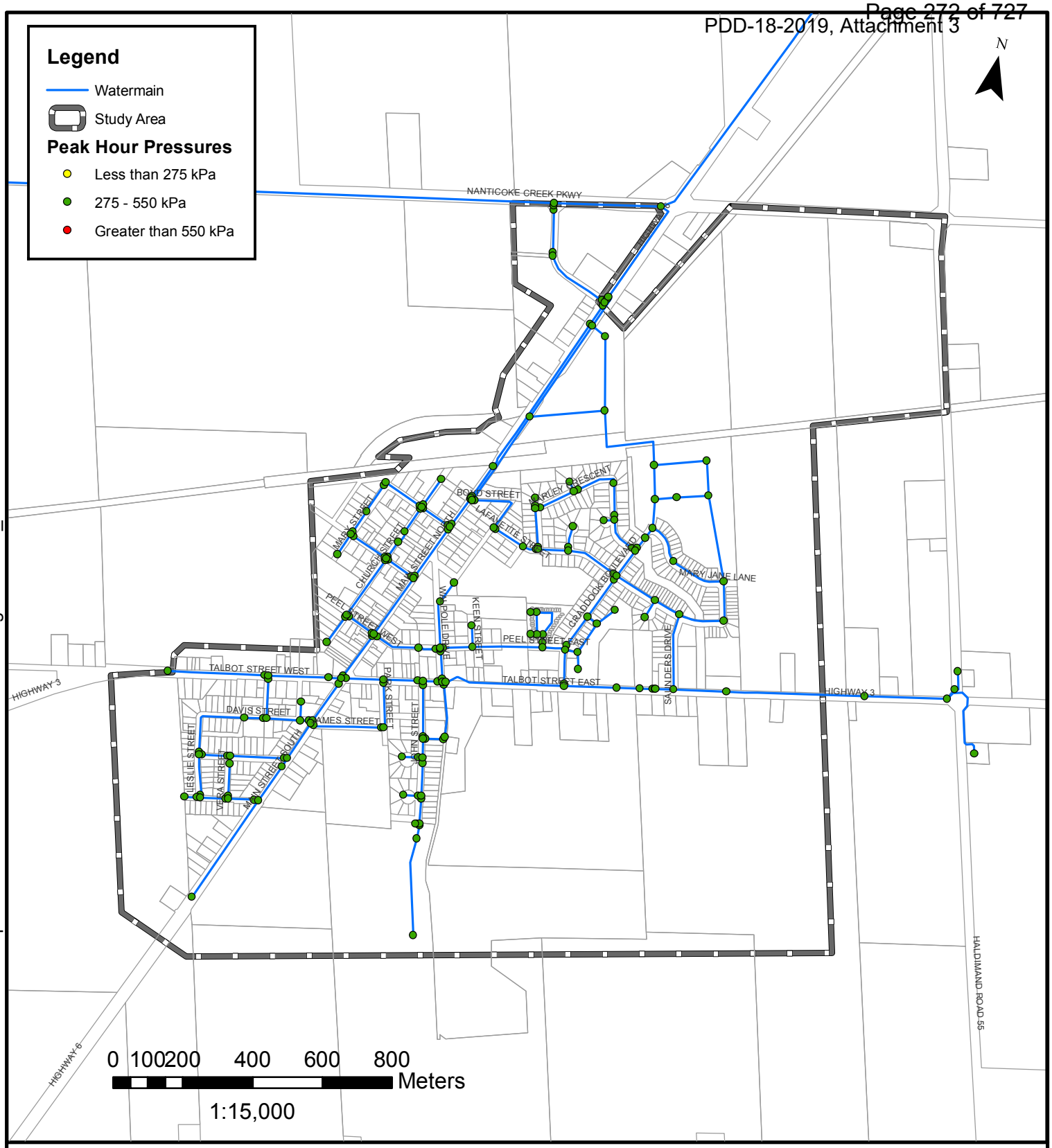
FIGURE 5

File Location: P:\28000\28176-000 - Jarvis Master Plan Update\3-Production\1-Civil\GIS\Work Package 2\28176_FutureMaxDemand.mxd

Plot Date: June 5, 2019 8:02:18 AM



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

FUTURE (2038) SYSTEM PRESSURES UNDER PEAK HOUR DEMAND

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FIGURE 4

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_FuturePeakHour.mxd

Plot Date: March 22, 2019 2:28:41 PM

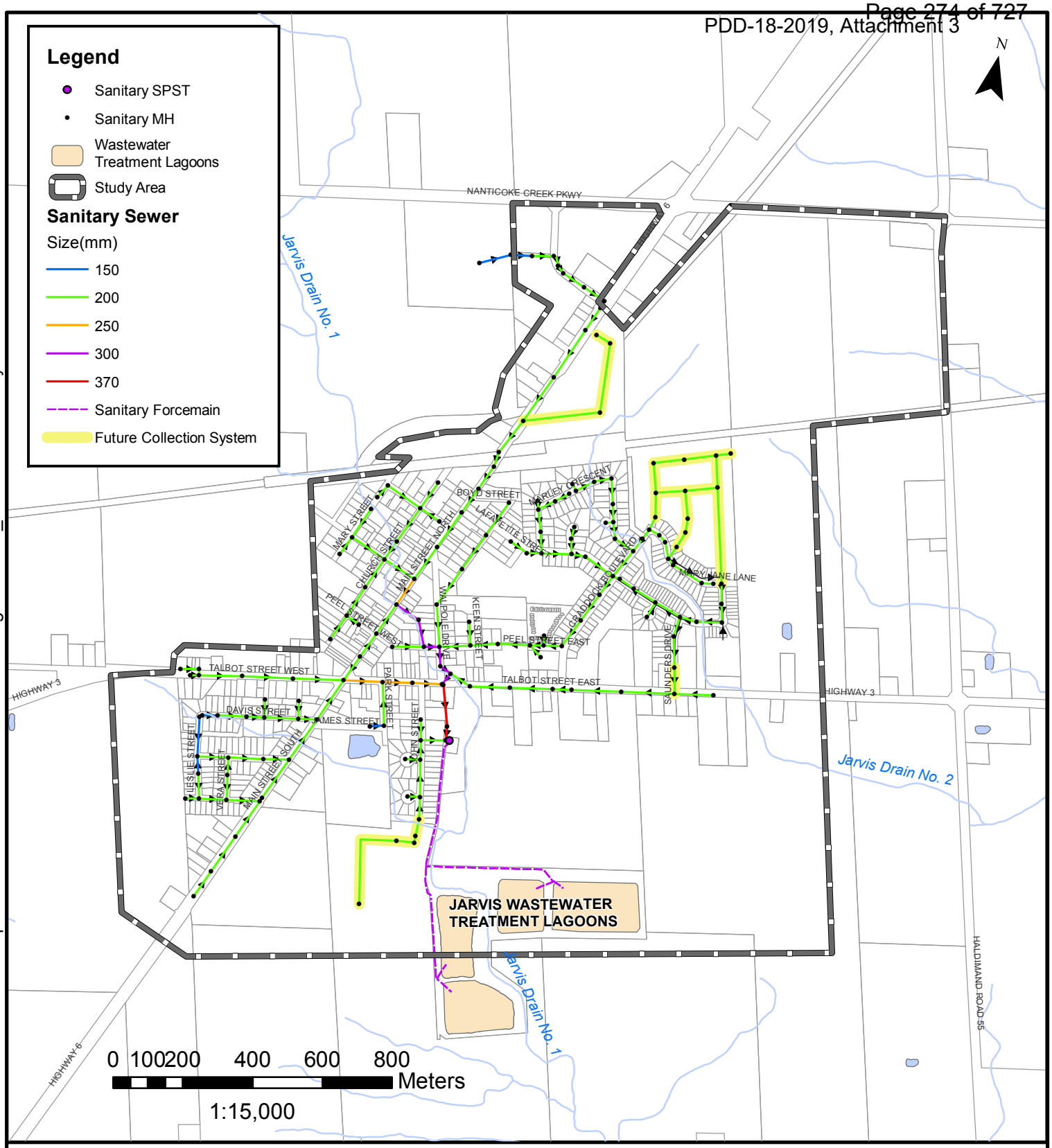
4.4.3 System Redundancy

As noted in Work Package 1 and the 2010 MSP, the supply to Jarvis is a single connection via a 500 mm diameter transmission main that also provides water to Hagersville. Work Package 3 will consider an additional connection from the Nanticoke WTP to increase water supply redundancy and improve system looping.

5.0 WASTEWATER SERVICING

5.1 Wastewater Collection System

The hydrologic and hydraulic computer simulation model was updated to include future population growth to 2038. The future wastewater collection system is shown in Figure 6. Future sewermains to be added are highlighted in yellow. All model inputs can be found in Appendix B.



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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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FUTURE (2038) WASTEWATER COLLECTION SYSTEM

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FIGURE 6

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_FutureWasteColSystem.mxd

Plot Date: March 21, 2019 1:30:36 PM

5.2 Future Modelled Wastewater Flows Collection System

The future wastewater flow rates were calculated using a uniform per capita generation rate and an equivalent population. To add wastewater flow on future development lands, the equivalent population for anticipated residential and ICI growth was calculated as detailed in Section 3.1.4. Once equivalent populations for future development was established, the total future flow was determined as follows:

- The average dry weather flow was calculated using the per capita sewage generation rate from the 2010 MSP of 280 L/capita/day.
- Peaking factors, based on the Harmon formula, were then used to determine the peak flow rates generated from newly added and existing parcels.
- Wet weather flow rates were calculated by assuming an inflow and infiltration (I/I) rate of 0.23 L/s/ha per the 2015 Haldimand County Design.

The updated average, peaked dry weather, inflow and infiltration, and total peaked wet weather flow are summarized in Table 9.

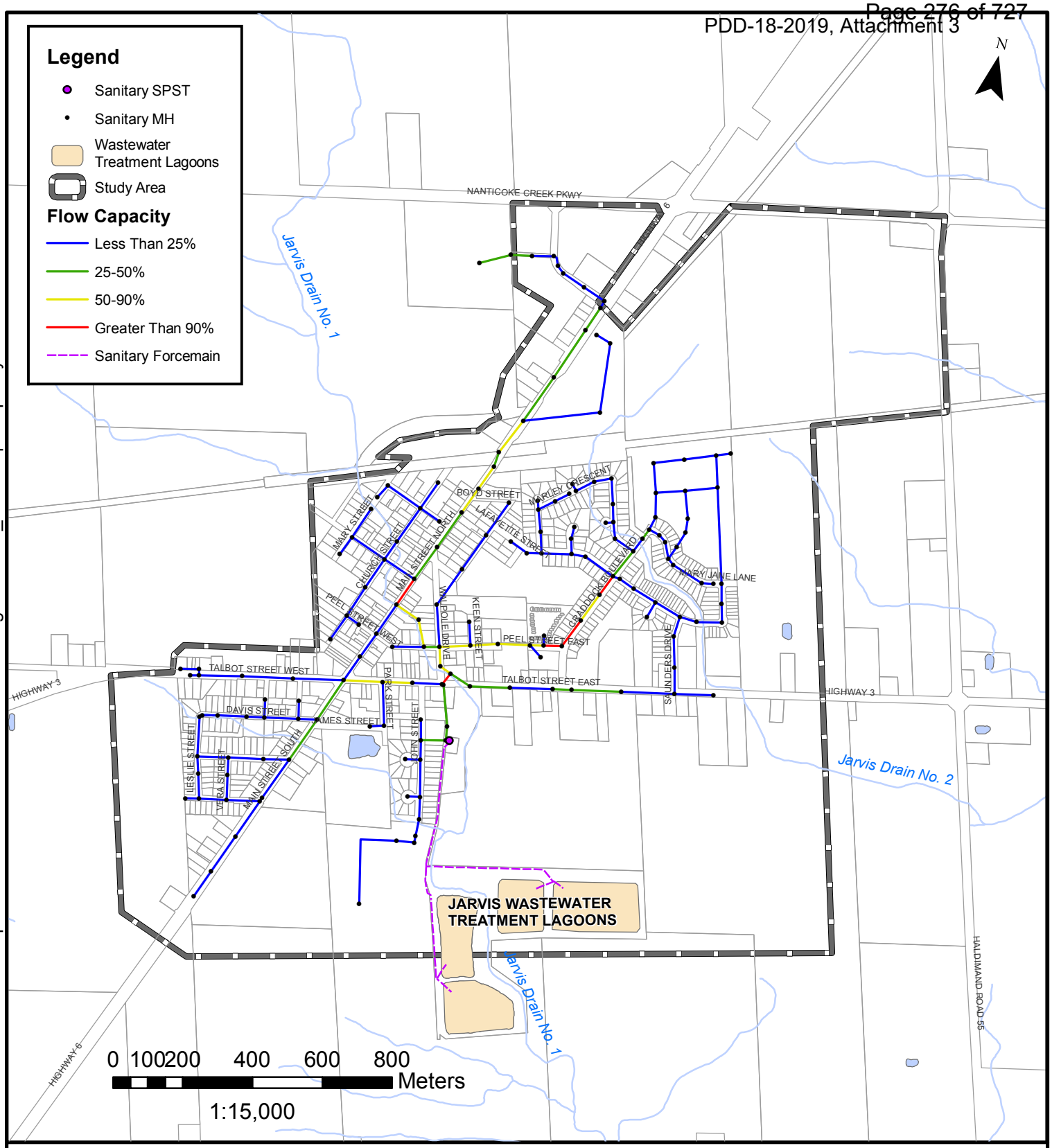
Table 9 Summary of Modelled Wastewater Flow (Future)

Land Use	Average Day Dry Weather (L/s)	Peaked Dry Weather (L/s)	Inflow and Infiltration (L/s)	Total Peaked Wet Weather Flow (L/s)
Total 2017	8.56	31.3	28.7	60.0
Additional Residential to 2038	1.65	5.81	1.70	7.50
Additional ICI to 2038	0.85	1.93	0.57	2.50
Total 2038 Wastewater Flow	**11.1**	**39.0**	**31.0**	**70.0**

Using this approach the updated <u>future</u> peaked wet weather wastewater flow rate is estimated to be 70.0 L/s (6,048 m^3/day).

5.3 Future Wastewater Servicing Conditions and Constraints

In addition to the potential flood risk at Walpole Drive and Talbot Street East intersection for the existing population, there is also potential flooding at the intersection of Craddock Boulevard and Peel Street East in the future. Sewers around this area will be operating at capacity under future population. There will also be capacity constraints at Main Street North just south of Lydia Street. Figure 7 shows the flow to pipe capacity ratio for the future wastewater conveyance system.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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FUTRE (2038) FLOW TO PIPE CAPACITY RATIO

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FIGURE 7

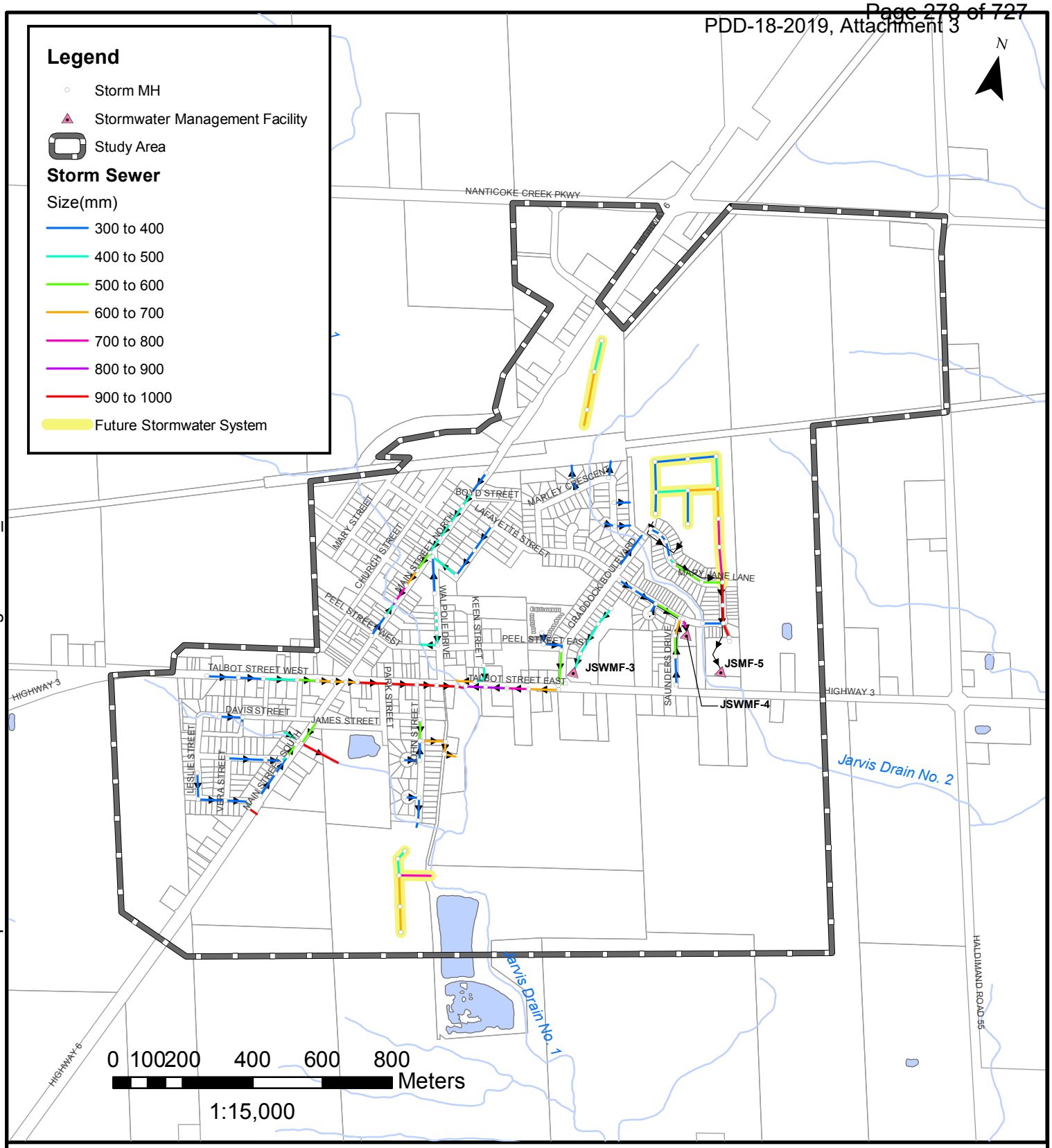
File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_FuturePipeCapacity.mxd

Plot Date: March 21, 2019 12:02:20 PM

6.0 STORMWATER

6.1 Future Modelled Stormwater System

The stormwater drainage model was updated to include future population growth to 2038. Future development has been added with reconfiguration of the storm system where required to facilitate the future development (e.g. culverts added for road crossings to new developments) and with servicing for the new developments including downstream water quantity controls. The future stormwater drainage system is shown in Figure 8. Future roads and drainage infrastructure added are highlighted in yellow. Detailed input files are included in Appendix C.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

FUTURE (2038) STORMWATER DRAINAGE SYSTEM

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FIGURE 8

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_FutureStm.mxd

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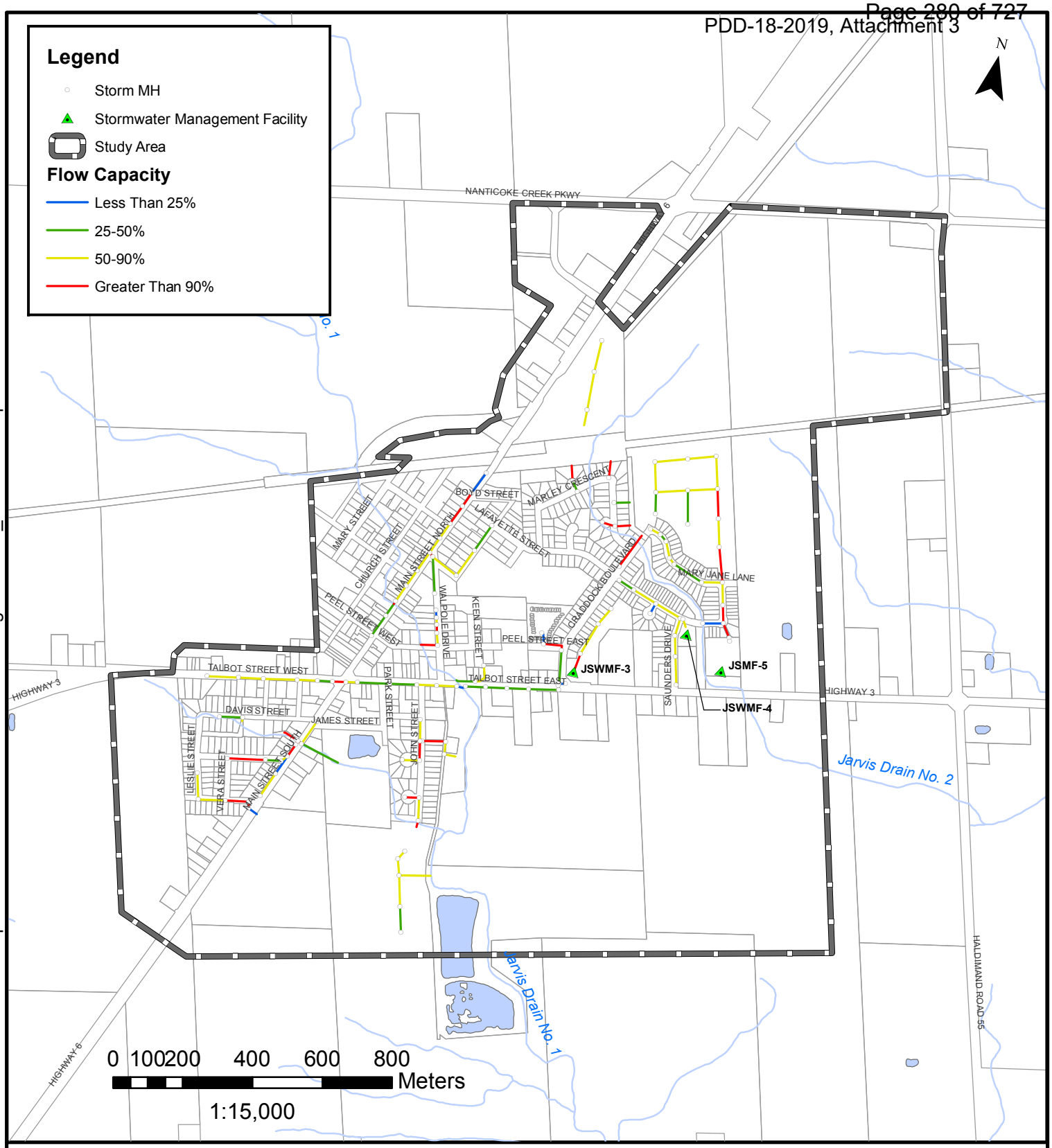
6.2 Future Stormwater Servicing Conditions and Constraints

6.2.1 Surcharge Under Rainfall Events (5-Year Storm)

There are no changes to the surcharge findings identified under the existing condition when the future population is added to the storm model. In general, the future stormwater servicing system operates as intended under everyday rainfall events. Comparing design rainfall events, the majority of storm sewers are surcharged under the design 5-year event (refer to Figure 9); however, water is mostly contained below ground surface. There are two (2) locations where water surcharges to the surface in the 5-year event, both of which are in the Marley/Craddock sewershed.

6.2.2 Flow to Pipe Capacity Ratio

There are also no changes to the pipe capacity ratios. As shown in Figure 10, two (2) independent inlets and sewers discharging to Jarvis Drain No. 1 on Cabot Court and Craddock Boulevard accept more inflow than the sewer capacity can handle, which causes surcharge to the surface. In the case of Cabot Court, the road grade slopes away from Marley Crescent and traps overland drainage which sits and ponds over the inlet. The water level of Jarvis Drain No. 2 will also influence the ability of this sewer to outlet under extreme events. Surcharge occurs in the 2-year storm at Cabot, but does not flood the surface.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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FUTURE (2038) FLOW TO PIPE CAPACITY RATIO

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FIGURE 10

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_FutureStmCapFlow.mxd

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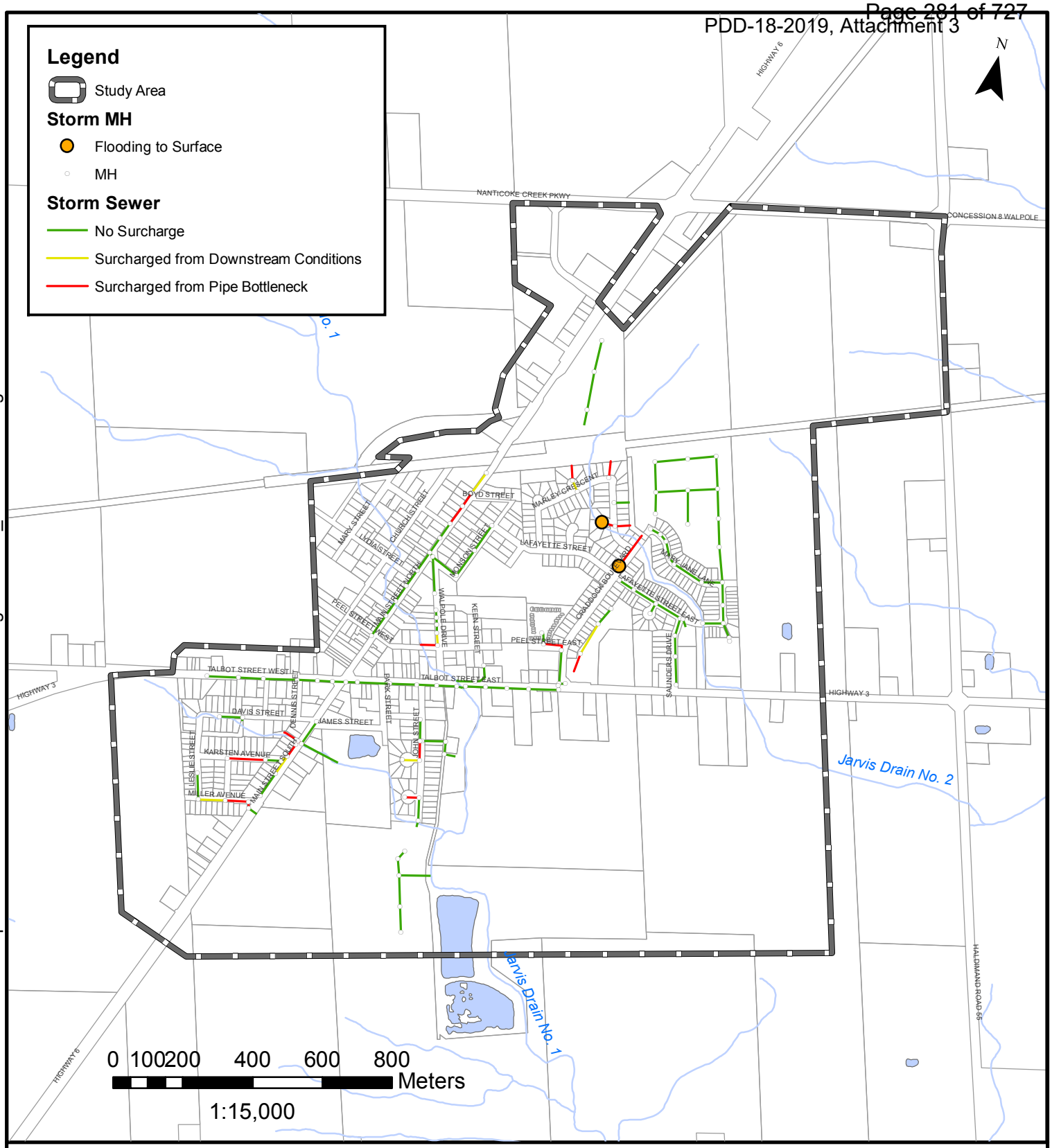

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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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FUTURE (2038) SURCHARGE TO SURFACE MAP UNDER 5-YEAR

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FIGURE 9

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7.0 TRANSPORTATION SERVICING

The study area intersections were analyzed under future traffic conditions, using Synchro 9.2 software which implements Highway Capacity Manual (HCM) 2000 procedures. The results indicate the study area intersections are generally operating with acceptable levels of service (LOS) and well within capacity.

Under future conditions there is a decrease in LOS at the intersection of Talbot Street and Main Street and the eastbound approach movement on Nanticoke Creek Parkway. No critical movements are identified at any of the study intersections. In the future, there is potential for remedial measures at the intersections of Nanticoke Creek Parkway at Highway 6 and Main Street and Talbot Street.

Please refer to Appendix D for the full report.

8.0 CONCLUSION

This work package has been prepared for the exclusive use of Haldimand County, for the stated purpose. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Haldimand County and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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Reviewed by

Michael Troop, P.Eng.
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9.0 REFERENCES

Haldimand County Services and Planning Division. Design Criteria, Version 4.0, April 2015.

Ministry of the Environment, Conservation and Parks. *Design Guidelines for Sewage Works*, 2008.

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update, 2016-2046 - Preliminary Draft Findings*. October 2018.

Watson & Associates Economists Limited. *Haldimand County Development Charge Background Study*, April 2014.

Appendix A

Water Model Parameters

28176 Jarvis - 20 YEAR - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1		NANT_04	0.000000	260.000000	254.223511	-56.605007
2		NANT_03	0.000000	260.000000	254.355270	-55.313957
3		NANT_02	0.000000	260.000000	254.367935	-55.189812
4		NANT_01	0.000000	260.000000	259.987732	-0.120139
5		60V0030-B	0.000000	217.500015	252.838547	346.289856
6		60V0108-B	0.000000	217.000000	252.950272	352.284332
7		60V0050	0.000000	216.484467	252.940643	357.241730
8		60V0108	0.000000	216.121643	252.946640	360.856018
9		60T0102	0.000000	215.500000	252.726425	364.789551
10		60V0067	0.000000	215.500000	252.736389	364.887268
11		60V0060	0.000000	215.645859	252.883804	364.902527
12		60V0008	0.000000	215.500000	252.744583	364.967499
13		60T0101	0.029824	215.500000	252.748215	365.003204
14		60T0104	0.000000	215.565323	252.877289	365.627899
15		60V0068	0.000000	215.000000	252.754486	369.964264
16		FUT118	0.000000	214.500000	252.679810	374.132111
17		60V0030	0.057428	214.500000	252.714340	374.470459
18		60DEPO01	20.999851	209.307343	247.612289	375.358337
19		60D0016	0.525424	213.013535	251.505035	377.186432
20		FUT74	1.318991	213.750000	252.615341	380.849670
21		FUT10	0.525596	212.652039	252.008942	385.666565
22		60T0094	0.040812	212.304474	251.746796	386.503662
23		FUT12	0.525596	212.500000	251.960815	386.684814
24		60V0029	0.277210	212.792007	252.493729	389.045685
25		60T0114	0.149255	212.000015	251.720566	389.230225
26		60V0042	0.000000	212.000015	251.720581	389.230408
27		60V0043	0.000000	212.000015	251.721054	389.234955
28		60T0073	0.263026	212.000015	251.724380	389.267578
29		60V0044	0.000000	212.000015	251.725296	389.276520
30		60T0071	0.199511	211.944672	251.720596	389.772919
31		60T0115	0.170255	211.933945	251.724319	389.914337
32		FUT24	0.525596	212.132401	251.965057	390.328705
33		60V0004	0.000000	209.500000	249.341476	390.415039
34		FUT8	0.525596	212.121536	252.090332	391.662659
35		60CHAM01	0.000000	208.500000	248.514877	392.114288
36		60T0110	0.000000	208.500000	248.514877	392.114288
37		60D0013	0.023168	208.500000	248.514877	392.114288
38		FUT116	1.559989	212.500000	252.575241	392.705811
39		60V0045	0.389853	211.650864	251.733383	392.777100
40		FUT56	1.318991	212.250000	252.417786	393.612671
41		60T0116	0.196119	211.500000	251.680862	393.740784
42		60V0046	0.088523	211.500000	251.743561	394.355133
43		60T0117	0.209351	211.500000	251.745132	394.370605
44		60T0066	0.000000	211.500000	251.745209	394.371338
45		FUT6	0.525596	211.621353	251.970993	395.394592
46		60T0009	0.277510	210.987991	251.485901	396.847565
47		60V0017	0.000000	211.000000	251.506104	396.927887
48		60V0098	0.000000	210.954376	251.485901	397.177002
49		60V0099	0.573160	210.934845	251.485992	397.369263
50		60T0017	0.273888	210.923599	251.506134	397.676910

28176 Jarvis - 20 YEAR - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
51	☐	60V0016	0.000000	210.902222	251.505600	397.881256
52	☐	60V0037	0.135650	211.000000	251.616867	398.013275
53	☐	60T0063	0.113255	211.000000	251.629456	398.136719
54	☐	60V0038	0.341278	211.000000	251.632339	398.164948
55	☐	60V0047	0.210687	211.116364	251.760345	398.278900
56	☐	60T0050	0.000000	210.668259	251.323364	398.387970
57	☐	60T0049	0.000000	210.651367	251.323364	398.553497
58	☐	60V0039	0.000000	211.000000	251.681000	398.641663
59	☐	60T0068	0.300550	211.000000	251.681030	398.642029
60	☐	FUT22	0.123275	210.930786	251.615662	398.679688
61	☐	60D0004	0.000000	210.773239	251.485550	398.948547
62	☐	FUT98	0.449247	210.757385	251.479050	399.040222
63	☐	60T0065	0.000000	211.020187	251.762589	399.243439
64	☐	60V0005	0.000000	210.582504	251.326004	399.254303
65	☐	FUT14	0.003402	211.059418	251.825729	399.477692
66	☐	60V0041	0.000000	210.945236	251.719330	399.554169
67	☐	60T0069	0.065536	210.950851	251.735916	399.661469
68	☐	60V0048	0.000000	211.000000	251.786240	399.672943
69	☐	60V0040	0.000000	210.926422	251.721451	399.759186
70	☐	60T0052	0.739437	209.935852	250.735046	399.799927
71	☐	FUT30	0.064719	210.500015	251.300964	399.817291
72	☐	60T0118	0.268618	210.912445	251.719269	399.874603
73	☐	60V0006	0.666901	210.500015	251.341202	400.211609
74	☐	FUT92	0.000000	210.500015	251.373764	400.530609
75	☐	60V0065	0.000000	210.509949	251.485580	401.528900
76	☐	60V0095	0.000000	210.474167	251.485901	401.882660
77	☐	60V0066	0.000000	210.466293	251.485550	401.956329
78	☐	60T0006	0.269718	210.453217	251.485550	402.084442
79	☐	FUT20	0.121595	210.557388	251.615677	402.338867
80	☐	J10	0.021852	210.809509	251.897446	402.629303
81	☐	60T0010	0.401197	210.391907	251.485901	402.688721
82	☐	FUT96	0.449247	210.345306	251.479614	403.083771
83	☐	60V0033	0.000000	210.607468	251.773804	403.397827
84	☐	60V0096	0.000000	210.312668	251.485825	403.464478
85	☐	60T0077	0.432645	210.591934	251.776260	403.573975
86	☐	60V0064	0.000000	210.300110	251.485550	403.584839
87	☐	60V0063	0.400913	210.278503	251.485550	403.796692
88	☐	60T0004	0.000000	210.257309	251.485550	404.004211
89	☐	60T0098	0.404153	211.190002	252.454803	404.362549
90	☐	60V0103	0.000000	210.554169	251.869125	404.854034
91	☐	60T0096	0.572064	210.492371	251.808609	404.866760
92	☐	60V0028	0.000000	211.093811	252.411652	404.882202
93	☐	60V0087	0.225046	210.174545	251.495529	404.913300
94	☐	60T0113	0.000000	211.122955	252.453308	405.004791
95	☐	60V0027	0.000000	210.451721	251.803940	405.219330
96	☐	FUT26	0.056265	210.504349	251.866577	405.317444
97	☐	60T0097	0.000000	211.058395	252.460464	405.707611
98	☐	85CHAM01	0.000000	211.054688	252.460464	405.743927
99	☐	60V0026	0.000000	210.392151	251.803497	405.798706
100	☐	60T0014	0.226118	210.042816	251.499710	406.244812

28176 Jarvis - 20 YEAR - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
101	☐	60V0020	0.000000	210.038116	251.498718	406.281219
102	☐	60T0060	0.000000	210.003021	251.465973	406.304413
103	☐	FUT18	0.065823	210.248367	251.723358	406.422333
104	☐	60D0002	0.000000	210.000000	251.485687	406.527100
105	☐	60V0007	0.000000	211.054688	252.550827	406.629364
106	☐	60V0081	0.000000	210.039459	251.642853	407.680511
107	☐	60D0019	0.000000	209.826233	251.465973	408.036621
108	☐	60D0007	0.079533	210.000000	251.642838	408.066986
109	☐	60V0062	0.000000	209.811752	251.485672	408.371613
110	☐	60D0008	0.000000	210.195251	251.879395	408.471832
111	☐	FUT100	0.000000	209.799026	251.488937	408.528198
112	☐	60T0002	0.313392	209.763763	251.485687	408.842041
113	☐	60T0085	0.199213	209.892593	251.642853	409.119812
114	☐	60V0082	0.000000	209.867691	251.640060	409.336334
115	☐	FUT28	0.126470	209.834488	251.608063	409.348145
116	☐	60V0091	0.000000	209.817917	251.746796	410.869934
117	☐	60D0009	0.072495	209.571365	251.527054	411.132782
118	☐	60T0023	0.098307	209.500000	251.502350	411.589874
119	☐	60V0092	0.000000	209.743240	251.746094	411.594818
120	☐	60V0011	0.000000	209.491943	251.502350	411.668823
121	☐	60T0091	0.179135	209.706726	251.746796	411.959686
122	☐	60V0036	0.259490	209.404602	251.466400	412.172638
123	☐	FUT138	0.249248	209.400009	251.465546	412.209198
124	☐	60V0090	0.000000	209.683838	251.751068	412.225739
125	☐	60T0080	0.131041	209.646225	251.771851	412.797943
126	☐	60V0014	0.000000	209.367783	251.512024	412.980286
127	☐	60V0089	0.000000	209.558136	251.745331	413.401367
128	☐	60T0015	0.000000	209.257446	251.502563	413.968903
129	☐	60T0058	0.000000	209.218567	251.465973	413.991272
130	☐	60T0090	0.215738	209.472870	251.732376	414.109863
131	☐	60T0059	0.000000	209.192245	251.465973	414.249237
132	☐	60V0015	0.000000	209.211105	251.512238	414.517792
133	☐	60V0013-B	0.000000	209.199997	251.513306	414.637024
134	☐	60V0013	0.221216	209.184113	251.516724	414.826385
135	☐	FUT34	0.709245	209.131149	251.464584	414.834412
136	☐	60V0076	0.000000	209.347702	251.731628	415.329132
137	☐	60V0019	0.000000	209.098526	251.487534	415.378906
138	☐	60V0012	0.000000	209.109009	251.512115	415.516998
139	☐	60T0047	0.216938	208.974655	251.448685	416.212097
140	☐	60V0056	0.000000	208.969894	251.449524	416.267090
141	☐	60T0045	0.000000	208.958603	251.463852	416.518097
142	☐	60D0020	0.000000	208.939255	251.465973	416.728333
143	☐	60T0044	1.526909	208.906113	251.465973	417.053101
144	☐	60V0052	0.000000	208.896820	251.465973	417.144287
145	☐	60D0021	0.148371	208.929535	251.502472	417.181244
146	☐	60V0018	0.000000	208.859222	251.503647	417.881927
147	☐	60V0105	0.000000	208.740967	251.502731	419.031647
148	☐	60V0097	0.000000	208.723145	251.487854	419.060425
149	☐	60V0034	0.149855	208.878708	251.699387	419.608978
150	☐	60V0021	0.000000	208.744949	251.603912	419.984161

28176 Jarvis - 20 YEAR - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
151	☐	60T0013	0.382733	208.588837	251.487961	420.377655
152	☐	60V0022	0.000000	208.706741	251.608795	420.406311
153	☐	60V0106	0.000000	208.597763	251.502716	420.434692
154	☐	60T0016	0.108289	208.595398	251.504105	420.471588
155	☐	60V0023	0.000000	208.613220	251.604721	421.282806
156	☐	60T0021	0.121303	208.500000	251.502380	421.389465
157	☐	60V0107	0.000000	208.500000	251.502396	421.389648
158	☐	60T0036	0.361157	208.601425	251.608017	421.430664
159	☐	60V0093	0.000000	208.294495	251.493546	423.316650
160	☐	60T0038	0.243002	208.248505	251.527084	424.096008
161	☐	60V0069	0.000000	208.019089	251.490891	425.989471
162	☐	60T0087	0.054200	208.223663	251.716766	426.198151
163	☐	65WBS01	34.499756	209.000015	252.506958	426.333832
164	☐	60T0024	0.315340	207.831192	251.492126	427.842773
165	☐	60V0032	0.000000	208.000000	251.716171	428.384033
166	☐	60T0088	0.148523	208.000000	251.716782	428.390045
167	☐	60V0104	0.000000	208.000000	251.717590	428.397888
168	☐	60V0049	0.209247	207.944290	251.729065	429.056305
169	☐	60V0035	0.000000	207.715210	251.559601	429.640533
170	☐	60V0077	0.149999	207.816422	251.723190	430.251831
171	☐	60T0040	0.000000	207.551987	251.561462	431.258209
172	☐	60T0039	0.210691	207.459885	251.560608	432.152344
173	☐	60V0025	0.000000	207.510071	251.713089	433.154724
174	☐	60T0112	0.000000	207.463470	251.719757	433.676788
175	☐	60V0080	0.000000	207.292313	251.555756	433.746826
176	☐	60T0081	0.439407	207.435562	251.709061	433.845459
177	☐	60V0024	0.000000	207.433746	251.709061	433.863220
178	☐	60V0079	0.000000	207.194122	251.563034	434.780334
179	☐	60V0086	0.000000	207.281921	251.709518	435.355530
180	☐	60V0009	0.000000	207.053787	251.491608	435.455811
181	☐	60V0074	0.000000	207.000000	251.458664	435.659851
182	☐	60V0073	0.000000	207.000000	251.461548	435.688110
183	☐	60T0031	0.149799	207.000000	251.461609	435.688629
184	☐	60T0108	0.255054	206.997284	251.461395	435.713257
185	☐	60V0085	0.000000	207.242386	251.710190	435.749359
186	☐	60T0029	0.234978	207.000000	251.475128	435.821167
187	☐	60V0071	0.000000	207.000000	251.475586	435.825745
188	☐	60V0070	0.000000	207.000000	251.475876	435.828461
189	☐	60T0083	0.255014	207.215729	251.709167	436.000549
190	☐	60T0027	0.000000	206.985001	251.479401	436.010071
191	☐	60V0031	0.000000	207.189072	251.707153	436.242249
192	☐	60V0102	0.000000	206.950684	251.478851	436.340912
193	☐	60V0078	0.000000	207.000000	251.572128	436.771698
194	☐	60V0084	0.000000	207.131897	251.709167	436.822052
195	☐	60V0051	0.000000	206.792816	251.488968	437.987091
196	☐	60T0025	0.269240	206.671402	251.491440	439.201050
197	☐	60T0026	0.000000	206.635651	251.489578	439.533173
198	☐	60V0072	0.000000	206.561234	251.431442	439.692719
199	☐	60V0010	0.000000	206.603424	251.497971	439.931213
200	☐	60D0006	0.000000	206.506790	251.431000	440.221832

28176 Jarvis - 20 YEAR - Peak Hour Pressures

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
201	☐	60V0072-B	0.000000	206.475525	251.431442	440.532562
202	☐	60V0100-B	0.000000	206.467896	251.431442	440.607361
203	☐	60T0032	0.159695	206.390778	251.441376	441.460388
204	☐	60V0100	0.000000	206.381790	251.440399	441.538818
205	☐	TOWNSEND_01	47.999660	209.000015	254.097809	441.923035
206	☐	60V0101	0.000000	206.339981	251.441345	441.957794
207	☐	60T0107	0.266822	206.270767	251.441193	442.634583
208	☐	FUT4	1.145992	205.250000	251.416580	452.396088
209	☐	FUT94	0.615996	204.500000	251.429993	459.876953

28176 Jarvis - 20 YEAR - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
1	☐	60D0019	89.999359	40.007126	137.862915	138.041077	60D0019	137.862915	223.895004
2	☐	60T0060	89.999359	44.298424	137.862915	138.037033	60T0060	137.862915	224.071777
3	☐	60D0020	89.999359	44.642319	137.862915	138.029907	60D0020	137.862915	223.008026
4	☐	FUT4	90.940353	45.172379	137.862915	138.040924	FUT4	137.862915	219.318787
5	☐	60D0002	89.999359	45.180470	137.862915	138.061050	60D0002	137.862915	224.068787
6	☐	60D0013	90.025429	50.112064	137.862915	137.843506	60D0013	137.862915	222.568787
7	☐	60T0059	89.999359	50.356541	137.862915	138.016403	60T0059	137.862915	223.261017
8	☐	60T0110	89.999359	50.361610	137.862915	149.925705	60DEPO01	125.777473	222.142822
9	☐	60CHAM01	89.999359	50.361622	137.862915	144.708923	60DEPO01	131.153168	222.691391
10	☐	60T0058	89.999359	55.304787	137.862915	145.687973	60T0060	130.176041	223.287338
11	☐	60V0072-B	89.999359	56.413589	137.862915	138.084427	60V0072-B	137.862930	220.544312
12	☐	60V0072	89.999359	56.584190	137.862915	138.083527	60V0072	137.862930	220.630020
13	☐	60D0006	89.999359	56.929203	137.862915	138.081131	60D0006	137.862930	220.575562
14	☐	60V0100-B	89.999359	57.183765	137.862915	138.993713	60V0072	136.948288	220.536682
15	☐	FUT94	90.410355	57.340260	137.862915	151.352539	60D0006	124.834267	219.246002
16	☐	60DEPO01	103.999260	57.501480	137.862915	137.902664	60DEPO01	137.862915	223.376114
17	☐	60V0004	89.999359	59.564060	137.862915	143.970627	60DEPO01	131.748734	222.752167
18	☐	60T0107	90.149445	60.507671	137.862915	138.018066	60T0107	137.862930	220.339539
19	☐	60V0100	89.999359	64.355782	137.862915	139.811630	60V0072	136.050858	220.445099
20	☐	60V0101	89.999359	64.542641	137.862915	137.995651	60V0101	137.862930	220.408768
21	☐	60T0032	90.089188	65.399239	137.862915	139.716171	60V0072	136.133041	220.453491
22	☐	60D0004	89.999359	68.711311	137.862915	137.944855	60D0004	137.862930	224.842026
23	☐	60D0016	90.294914	72.495415	137.862915	137.916290	60D0016	137.862930	227.082306
24	☐	60T0108	90.142830	72.587372	137.862915	137.920334	60T0108	137.862930	221.066055
25	☐	60V0066	89.999359	75.166801	137.862915	140.915482	60D0004	134.855103	224.535080
26	☐	60T0094	90.045273	75.494949	137.862915	137.890656	60T0094	137.862930	226.373260
27	☐	60V0052	89.999359	76.045670	137.862915	148.735977	60T0060	127.023041	222.965591
28	☐	60D0009	90.040138	76.450027	137.862915	137.891968	60D0009	137.862930	223.640137
29	☐	60T0002	90.190239	76.795242	137.862915	140.212204	60D0002	135.547989	223.832535
30	☐	60V0062	89.999359	77.194420	137.862915	137.895889	60V0062	137.862930	223.880539
31	☐	60T0006	90.151077	77.491966	137.862915	141.031616	60D0004	134.726974	224.522003
32	☐	60V0065	89.999359	77.829750	137.862915	138.042892	60D0004	137.715897	224.827011
33	☐	60T0116	90.109680	79.666039	137.862915	137.878693	60T0116	137.862930	225.568787
34	☐	60V0064	89.999359	79.796555	137.862915	137.885376	60V0064	137.862930	224.368896
35	☐	60D0021	90.096123	80.095802	137.862915	137.880569	60D0021	137.862930	222.998322

Date: Sunday, March 24, 2019, Time: 13:08:28, Page 1

28176 Jarvis - 20 YEAR - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
36	☐	60V0063	90.224876	80.161224	137.862915	137.883789	60V0063	137.862930	224.347275
37	☐	60V0074	89.999359	80.248581	137.862915	137.884476	60V0074	137.862930	221.068771
38	☐	60T0004	89.999359	80.323257	137.862915	137.882996	60T0004	137.862930	224.326080
39	☐	60T0115	90.095131	80.604652	137.862915	137.876938	60T0115	137.862930	226.002731
40	☐	60V0073	89.999359	80.884743	137.862915	137.881348	60V0073	137.862930	221.068771
41	☐	60V0096	89.999359	81.013832	137.862915	137.880539	60V0096	137.862930	224.381454
42	☐	60D0007	90.048615	81.973923	137.862915	137.872208	60D0007	137.862930	224.068787
43	☐	60V0098	89.999359	82.142624	137.862915	137.876923	60V0098	137.862930	225.023163
44	☐	60V0095	89.999359	82.367569	137.862915	137.876160	60V0095	137.862930	224.542953
45	☐	60V0019	89.999359	82.458534	137.862915	137.874893	60V0019	137.862930	223.167313
46	☐	60T0009	90.155464	82.717140	137.862915	137.875397	60T0009	137.862930	225.056778
47	☐	60V0099	90.333435	82.979240	137.862915	137.874283	60V0099	137.862930	225.003632
48	☐	60T0010	90.225037	83.001877	137.862915	137.874268	60T0010	137.862930	224.460678
49	☐	60T0031	90.083626	84.156921	137.862915	137.886856	60V0074	137.846970	221.067139
50	☐	60T0114	90.083321	84.574997	137.862915	137.867950	60T0114	137.862930	226.068771
51	☐	60T0087	90.029846	86.350487	137.862915	137.864700	60T0087	137.862930	222.292450
52	☐	60V0097	89.999359	87.524796	137.862915	137.864334	60V0097	137.862930	222.791931
53	☐	60T0013	90.217529	88.293098	137.862915	140.697800	60V0019	135.052200	222.880478
54	☐	60T0117	90.117126	89.131302	137.862915	137.476837	60T0117	137.862930	225.568787
55	☐	60V0044	89.999359	89.257431	137.862915	137.562912	60V0044	137.862930	226.068771
56	☐	60T0073	90.147316	89.594284	137.862915	137.643021	60T0073	137.862930	226.068771
57	☐	FUT98	90.365608	89.751289	137.862915	137.597198	FUT98	137.862930	224.826172
58	☐	60V0087	90.149391	91.644722	137.862915	137.863419	60V0087	137.862930	224.243301
59	☐	60V0045	90.218658	92.134079	137.862915	137.863617	60V0045	137.862930	225.719635
60	☐	60V0042	89.999359	92.167175	137.862915	137.863647	60T0114	137.862854	226.068771
61	☐	60T0052	90.557991	93.064774	137.862915	146.163315	60DEPO01	129.566101	222.529434
62	☐	60V0043	89.999359	94.379562	137.862915	137.866577	60V0043	137.862946	226.068787
63	☐	60T0071	90.111588	95.730606	137.862915	138.411285	60T0114	137.320480	226.013428
64	☐	60V0017	89.999359	96.020317	137.862915	157.606796	60D0016	118.128357	225.068420
65	☐	60V0020	89.999359	97.382408	137.862915	137.875992	60V0020	137.862946	224.106903
66	☐	60T0017	90.164482	97.671944	137.862915	158.360458	60D0016	117.379547	224.992004
67	☐	60V0016	89.999359	98.754585	137.862915	144.680573	60D0016	131.459747	226.428879
68	☐	FUT34	90.625610	99.492355	137.862915	137.880081	FUT34	137.862946	223.199921
69	☐	60V0046	90.049156	99.734024	137.862915	137.881042	60V0046	137.862946	225.568787
70	☐	60T0014	90.126556	99.941452	137.862915	137.886276	60T0014	137.862946	224.111588

28176 Jarvis - 20 YEAR - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
71	☐	60V0039	89.999359	100.580551	137.862915	142.785004	60T0116	132.962906	225.068741
72	☐	60V0076	89.999359	101.339363	137.862915	137.885132	60V0076	137.862946	223.416489
73	☐	60T0066	89.999359	101.541641	137.862915	137.890121	60T0117	137.862701	225.568771
74	☐	60T0090	90.120712	101.624626	137.862915	137.885178	60T0090	137.862946	223.541656
75	☐	60V0071	89.999359	102.167435	137.862915	137.899719	60V0071	137.862946	221.068771
76	☐	60T0029	90.131538	102.431938	137.862915	137.984833	60V0074	137.778198	221.060135
77	☐	60V0070	89.999359	102.580215	137.862915	137.903046	60V0070	137.862946	221.068771
78	☐	60V0102	89.999359	102.598228	137.862915	137.901352	60V0102	137.862946	221.019455
79	☐	60V0077	90.089363	102.695122	137.862915	137.888809	60V0077	137.862946	221.885193
80	☐	60T0038	90.136047	102.813065	137.862915	150.861786	60D0009	124.900017	222.317276
81	☐	60T0027	89.999359	102.845184	137.862915	137.902863	60T0027	137.862946	221.053787
82	☐	60T0015	89.999359	103.635994	137.862915	137.907944	60T0015	137.862946	223.326218
83	☐	60V0029	90.275513	104.089729	137.862915	137.875137	60V0029	137.862946	226.860779
84	☐	60V0107	89.999359	104.553154	137.862915	137.912323	60V0107	137.862946	222.568787
85	☐	60V0104	89.999359	104.554138	137.862915	137.898972	60V0104	137.862946	222.068771
86	☐	60T0088	90.082909	104.841904	137.862915	140.091827	60T0087	135.671188	222.068771
87	☐	60T0021	90.088715	104.939285	137.862915	137.913361	60T0021	137.862946	222.568787
88	☐	60V0032	89.999359	105.934959	137.862915	137.907089	60V0032	137.862946	222.068771
89	☐	60V0091	89.999359	106.371506	137.862915	162.282318	60T0094	113.496529	223.886688
90	☐	60V0081	89.999359	106.534821	137.862915	137.917465	60V0081	137.862946	224.108246
91	☐	60T0085	90.132538	110.214943	137.862915	139.383118	60V0081	136.423630	223.961365
92	☐	60V0082	89.999359	111.080643	137.862915	137.954834	60V0082	137.862961	223.936478
93	☐	60V0014	89.999359	111.122536	137.862915	170.462158	60D0016	105.883408	223.818848
94	☐	60V0018	89.999359	111.520142	137.862915	137.981735	60V0018	137.862961	222.927994
95	☐	60T0044	90.858246	111.659233	137.862915	148.713379	60T0060	127.114265	222.974899
96	☐	60T0091	90.100121	111.663803	137.862915	163.414063	60T0094	112.406799	223.775482
97	☐	60V0105	89.999359	111.768433	137.862915	151.081238	60T0009	125.283272	223.773026
98	☐	60T0068	90.168419	111.882103	137.862915	142.864166	60T0116	132.962769	225.068726
99	☐	60V0092	89.999359	111.973930	137.862915	155.090668	60T0094	121.300934	224.683121
100	☐	60V0089	89.999359	112.195351	137.862915	157.856003	60T0094	118.552582	224.402664
101	☐	60V0106	89.999359	112.340607	137.862915	143.152359	60T0009	133.101608	224.570892
102	☐	60V0090	89.999359	112.549309	137.862915	160.347595	60T0094	115.801361	224.121887
103	☐	60T0016	90.080597	113.577446	137.862915	155.456497	60T0009	120.888458	223.324554
104	☐	60V0049	90.117065	115.036110	137.862915	137.976730	60V0049	137.862961	222.013077
105	☐	60V0030	90.035599	115.341118	137.862915	137.898056	60V0030	137.862961	228.568787

28176 Jarvis - 20 YEAR - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
106	☐	60V0015	89.999359	116.182213	137.862915	167.971069	60D0016	108.933266	224.130081
107	☐	60V0013-B	90.000053	116.327026	137.862915	175.325714	60D0016	100.636284	223.283371
108	☐	60V0012	89.999359	116.940720	137.862915	171.894012	60D0016	104.721840	223.700302
109	☐	60V0013	90.248230	117.042084	137.862915	174.171844	60D0016	102.018555	223.424423
110	☐	60V0034	90.083656	117.735367	137.862915	138.006378	60V0034	137.862961	222.947495
111	☐	60T0112	89.999359	117.848923	137.862915	138.010254	60T0112	137.862961	221.532242
112	☐	FUT96	90.365608	118.305473	137.862915	142.121643	FUT98	133.821198	224.413712
113	☐	60V0041	89.999359	118.443504	137.862915	138.040466	60V0041	137.862961	225.014008
114	☐	60T0069	90.036224	118.792534	137.862915	138.034592	60T0069	137.862961	225.019623
115	☐	60V0011	89.999359	120.152191	137.862915	144.492050	60D0016	132.258179	226.510361
116	☐	60V0040	89.999359	120.335396	137.862915	138.066238	60V0040	137.862961	224.995193
117	☐	60T0023	90.109962	120.799179	137.862915	157.283310	60D0016	119.973106	225.256668
118	☐	60T0118	90.150459	121.013115	137.862915	138.070740	60T0118	137.862961	224.981232
119	☐	60V0085	89.999359	122.118317	137.862915	160.202667	60T0094	118.074509	224.353867
120	☐	60V0086	89.999359	122.301064	137.862915	157.118103	60T0094	121.018471	224.654297
121	☐	60V0078	89.999359	122.356827	137.862915	138.107498	60V0078	137.862976	221.068771
122	☐	60T0083	90.142807	122.908783	137.862915	164.549606	60T0094	113.799011	223.917557
123	☐	60V0031	89.999359	123.247559	137.862915	157.298096	60T0094	120.918251	224.644058
124	☐	FUT138	90.165611	123.271553	137.862915	138.180069	FUT138	137.862976	223.468781
125	☐	60V0084	89.999359	123.401505	137.862915	161.013367	60T0094	117.390068	224.284027
126	☐	FUT26	90.036873	124.753479	137.862915	138.112778	FUT26	137.862976	224.573120
127	☐	60T0050	89.999359	125.705315	137.862915	137.864838	60T0050	137.862976	224.737045
128	☐	60T0049	89.999359	125.975914	137.862915	138.030273	60T0050	137.697449	224.720154
129	☐	FUT30	90.042511	125.983063	137.862915	143.276825	60DEPO01	132.451645	222.823914
130	☐	60V0005	89.999359	126.157784	137.862915	137.865067	60V0005	137.862976	224.651276
131	☐	60V0069	89.999359	126.196709	137.862915	138.233459	60V0069	137.862976	222.087860
132	☐	FUT100	89.999359	126.892563	137.862915	139.246552	FUT98	136.950409	224.733032
133	☐	60V0006	90.671356	126.974236	137.862915	137.864792	60V0006	137.862976	224.568787
134	☐	60V0093	89.999359	127.040993	137.862915	156.319489	60D0016	121.461296	225.408554
135	☐	60V0027	89.999359	127.280647	137.862915	143.445740	60T0094	132.919052	225.868729
136	☐	FUT92	89.999359	127.334038	137.862915	137.865372	FUT92	137.862976	224.568787
137	☐	60T0024	90.196899	128.255859	137.862915	160.222565	60D0016	118.046684	225.060089
138	☐	60V0033	89.999359	129.032974	137.862915	138.164322	60V0033	137.862976	224.676239
139	☐	60V0023	89.999359	129.190186	137.862915	138.240829	60V0023	137.862976	222.682007
140	☐	60V0026	89.999359	129.206543	137.862915	143.285446	60T0094	133.122757	225.889526

28176 Jarvis - 20 YEAR - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
141	☐	60V0036	90.145325	129.324738	137.862915	138.322784	60V0036	137.862976	223.473373
142	☐	60T0096	90.321144	129.553268	137.862915	146.135895	60T0094	130.308060	225.602295
143	☐	60V0021	89.999359	129.738647	137.862915	158.443848	60D0016	119.255104	225.183411
144	☐	FUT22	90.081543	129.824371	137.862915	137.864700	FUT22	137.862976	224.999573
145	☐	60V0024	89.999359	129.868729	137.862915	154.224136	60T0094	123.810562	224.939224
146	☐	60V0009	89.999359	130.368118	137.862915	165.674118	60D0016	113.423996	224.588333
147	☐	60V0025	89.999359	130.493317	137.862915	156.566895	60T0094	121.566780	224.710251
148	☐	60V0022	89.999359	130.683228	137.862915	153.460678	60D0016	124.073334	225.675110
149	☐	60T0036	90.331573	130.807419	137.862915	159.561325	60D0016	118.275246	225.083420
150	☐	60T0081	90.261124	130.813248	137.862915	158.877945	60T0094	119.373337	224.486404
151	☐	60T0077	90.242722	130.859863	137.862915	138.178360	60T0077	137.862976	224.660721
152	☐	60V0051	89.999359	131.071487	137.862915	143.213043	60D0016	133.588028	226.646057
153	☐	60T0025	90.172752	131.242584	137.862915	171.254944	60D0016	108.297935	224.065231
154	☐	60T0026	89.999359	131.406036	137.862915	169.452057	60D0016	110.131569	224.252365
155	☐	60T0080	90.087669	131.469559	137.862915	138.192429	60T0080	137.862976	223.715012
156	☐	60V0010	89.999359	132.147385	137.862915	155.854172	60D0016	122.916122	225.557007
157	☐	60V0103	89.999359	132.600784	137.862915	138.232330	60V0103	137.862976	224.622955
158	☐	60V0047	90.117874	133.158813	137.862915	138.310593	60V0047	137.862976	225.185135
159	☐	60V0079	89.999359	133.480057	137.862915	138.346024	60V0079	137.862976	221.262909
160	☐	60V0035	89.999359	133.687683	137.862915	138.362366	60V0035	137.862976	221.783997
161	☐	60T0045	89.999359	136.023941	137.862915	142.735123	FUT98	133.234909	224.353882
162	☐	60V0080	89.999359	136.149017	137.862915	137.864532	60V0080	137.862976	221.361099
163	☐	60T0040	89.999359	137.668564	137.862915	138.336380	60V0035	137.393295	221.736069
164	☐	FUT24	90.349754	138.232681	137.862915	137.864624	FUT24	137.862976	226.201172
165	☐	60T0039	90.117874	138.509521	137.862915	137.864777	60T0039	137.862976	221.528671
166	☐	60V0037	90.089790	139.336105	137.862915	137.865997	60V0037	137.862976	225.068771
167	☐	60V0038	90.191330	139.682465	137.862915	137.865524	60V0038	137.862976	225.068771
168	☐	60V0056	89.999359	140.528168	137.862915	137.866562	60V0056	137.862976	223.038666
169	☐	60T0047	90.148582	140.997772	137.862915	137.866455	60T0047	137.862976	223.043442
170	☐	60T0065	89.999359	142.694199	137.862915	137.865265	60T0065	137.862976	225.088974
171	☐	60V0048	89.999359	143.344849	137.862915	137.865646	60V0048	137.862976	225.068771
172	☐	FUT20	90.080421	143.927185	137.862915	141.526154	FUT22	134.203934	224.626160
173	☐	60T0063	90.074867	147.540176	137.862915	137.867599	60T0063	137.862991	225.068771
174	☐	FUT18	90.043243	147.724533	137.862915	137.866989	FUT18	137.862991	224.317139
175	☐	FUT28	90.083679	147.920624	137.862915	143.732895	60DEPO01	132.220901	222.800354

28176 Jarvis - 20 YEAR - Maximum Day + Fire Flow

		ID	Total Demand (L/s)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)
176		FUT14	90.001633	150.066940	137.862915	137.866989	FUT14	137.862991	225.128189
177		FUT10	90.349754	152.507370	137.862915	137.866638	FUT10	137.862991	226.720825
178		FUT12	90.349754	152.802658	137.862915	137.866730	FUT12	137.862991	226.568771
179		60D0008	89.999359	156.692078	137.862915	137.867889	60D0008	137.863007	224.264038
180		J10	90.013931	159.313385	137.862915	137.868713	J10	137.863007	224.878311
181		FUT6	90.349754	164.944748	137.862915	137.870132	FUT6	137.863007	225.690140
182		FUT74	90.878357	173.281158	137.862915	137.865005	FUT74	137.863022	227.818787
183		FUT8	90.349754	174.803253	137.862915	141.280106	FUT10	134.495605	226.377182
184		60V0028	89.999359	175.556870	137.862915	137.866745	60V0028	137.863022	225.162598
185		60V0008	89.999359	187.309586	137.862915	137.865158	60V0008	137.863037	229.568802
186		85CHAM01	89.999359	189.170105	137.862915	137.869049	85CHAM01	137.863037	225.123474
187		60T0098	90.226692	190.216949	137.862915	137.868973	60T0098	137.863037	225.258789
188		60T0113	89.999359	208.564667	137.862915	137.876785	60T0113	137.863068	225.191742
189		60T0104	89.999359	211.659500	137.862915	137.866806	60T0104	137.863068	229.634109
190		60V0060	89.999359	213.699860	137.862915	137.867142	60V0060	137.863083	229.714645
191		FUT56	90.878357	214.305847	137.862915	138.527435	FUT10	137.240356	226.657288
192		60T0097	89.999359	217.128799	137.862915	146.967331	60D0016	129.441330	226.222900
193		60V0068	89.999359	221.077118	137.862915	137.870316	60V0068	137.863098	229.068787
194		60T0101	90.016136	221.898056	137.862915	137.871201	60T0101	137.863098	229.568802
195		60V0067	89.999359	236.223953	137.862915	137.877228	60V0067	137.863113	229.568802
196		60V0007	89.999359	239.605957	137.862915	155.986603	60D0016	120.097435	225.269363
197		FUT116	91.559349	251.094406	137.862915	147.109619	60D0016	128.656052	226.142761
198		65WBS01	124.499115	261.969879	137.862915	137.884308	65WBS01	137.863113	223.068802
199		FUT118	89.999359	262.433807	137.862915	137.899689	FUT118	137.863159	228.568802
200		60V0050	89.999359	264.130463	137.862915	137.881653	60V0050	137.863159	230.553284
201		60T0102	89.999359	264.725403	137.862915	137.899307	60T0102	137.863174	229.568802
202		60V0030-B	89.999359	273.510315	137.862915	137.900467	60V0030-B	137.863190	231.568802
203		60V0108	89.999359	280.523041	137.862915	141.100006	60V0050	134.659683	230.226364
204		60V0108-B	89.999359	285.728546	137.862915	143.546768	60V0030-B	132.213165	230.992233

Appendix B

Wastewater Model Parameters

Appendix B – PCSWMM Model Parameters

The following sets out a description of each of the parameters used in the steady state wastewater conveyance system modelling for the Jarvis Master Plan. Any differences from the below at any of the specific elements are noted in the description in the model. The PCSWMM model has been based on the previous H2OMAP modelling completed for the 2010 Master Plan.

A1.0 Link Elements

A1.1 Conduits

Conduits represent sanitary sewers.

Parameter	Units	Description / Values
Name	-	Conduits taken from the 2010 Master Plan maintain the same name which appears to be linked to one of the connecting nodes. New conduits are named based on the supplied GIS data.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.
Tag	-	No tags were used in the model.
Length	m	Length is auto-calculated in PCSWMM and is consistent with the 2010 Master Plan except for new links.
Roughness	-	For links from the 2010 Master Plan the roughness coefficient is maintained. For new sections a roughness coefficient of 0.013 is used.
Inlet Offset	m	Inlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Outlet Offset	m	Outlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Initial Flow	m^3/s	No initial flows are set in the model
Flow Limit	m^3/s	No flow limits are set in the model
Entry Loss Coeff.	-	No losses are used in a steady state conveyance model.

Parameter	Units	Description / Values
Exit Loss Coeff.	-	No losses are used in a steady state conveyance model.
Ave. Loss Coeff.	-	No losses are used in a steady state conveyance model.
Seepage Rate	mm/hr	There is no seepage applied to conduits in this model.
Flap Gate	-	No flapgates are used in the model.
Cross Section	-	Cross sections are generally circular for sewers, rectangular for streets, trapezoidal for open channel flow and either circular, elliptical or rectangular for cuvlerts. Cross sections are consistent with the 2010 Master Plan.
Geom1	m	**Type** / **Description** Circular / Pipe diameter Ellipse / Maximum Depth or Standard Size ID
Geom2	m	**Type** / **Description** Circular / Not used Ellipse / Maximum Width or not used
Barrels	-	The number of identical sewers within the conduit, usually 1.
Transect	-	Refers to transect data, if used, for the open channel links.
Shape Curve	-	Not used in this model.
Culvert Code	-	Not used in this model.

A2.0 Node elements

A2.1 Storage

Storage nodes are used to represent manholes in the system.

Parameter	Units	Description / Values
Name	-	Naming is as per 2010 Master Plan.
Tag	-	No tags were used.

Parameter	Units	Description / Values
Inflows	-	Sanitary sewer flows are included as inflows as per Section A2.3.
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevations are taken from the 2010 Master Plan except new nodes where it is based on GIS data.
Rim Elevation	m	Elevation at the lid of the node taken from the 2010 Master Plan except new nodes where it is based on GIS data..
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are used if there is backwater in the system at the start of the simulation. It is not used here.
Ponded Area	m^2	No ponded areas are set in the model.
Evaporation Factor	fraction	No evaporation is considered in design event analysis.
Storage Curve	-	Manholes have an assumed storage of 1.13 m^2 representing a 1200 mm diameter manhole.

A2.2 Outfalls

A single outfall is present in the model at the pump station location. Since only a steady state analysis is being carried out the downstream boundary condition does not impact results.

Parameter	Units	Description / Values
Name	-	Outfalls are named as per the 2010 Master Plan.
Tag	-	No tags were used for the outfalls.
Inflows	-	No external inflows are applied at outfall nodes
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevation of the node is as per the 2010 Master Plan.

Parameter	Units	Description / Values
Rim Elevation	m	Elevation at the lid of the node as per the 2010 Master Plan.
Tide Gate	-	No backflow is prevented in the model outfalls and therefore 'No' is selected.
Route To	-	If flow from the outfall is directed to another subcatchment but this is not done in the model and this parameter is left blank.
Type	-	All outfalls have NORMAL outfall type which means depth of flow at the outlet is not affected by downstream conditions.

A2.3 Inflows

Parameter	Units	Description / Values
Baseline	m^3/s	For direct flow into a drainage system, not used in the model.
Baseline Pattern	-	For direct flow into a drainage system, not used in the model.
Timeseries	-	For direct flow into a drainage system, not used in the model.
Scale Factor	-	For direct flow into a drainage system, not used in the model.
Average Value	m^3/s	The average value represents the DWF into the system at the node. It consists of the base flow multiplied by the peaking factor and the infiltration component.
Time Patterns	-	Where no time patterns are applied to the average value the time value is 1.0.
Hydrograph	-	Used for wet weather flows and not included in the model.
Sewershed Area	ha	The sewershed areas contributing to the node.

Appendix C

Stormwater Model Parameters

Appendix A – PCSWMM Model Parameters

The following sets out a description of each of the parameters used in the dual drainage modelling for the Jarvis Master Plan. Any differences from the below at any of the specific elements are noted in the description in the model. The PCSWMM model has been based on the previous Infoworks CS modelling completed for the 2010 Master Plan.

A1.0 Subcatchments

Parameter	Units	Description
Name	-	The name of the subcatchment as per the 2010 Master Plan and is based on the receiving node ID. New areas have a name based on the downstream receiving node ID.
Tag	-	The catchments are tagged by one of the land use covers identified in the 2010 Master Plan. The catchments representing the most recent development occurred in 2010 were tagged as 'Recent_Development'. The catchments representing the future development that will occur by 2020 were tagged as 'Future_Development'.
Rain Gauge	-	The storm type selected for the model run. The following IDF parameters, as per the 2010 Master Plan, were used to create the 3-hour Chicago design storms: **Return Period** / **a** / **b** / **c** / **Depth (mm)** 1:2 year / 646.0 / 6.0 / 0.781 / 32.6 1:5 year / 1,049.5 / 8.0 / 0.803 / 47.0 1:100 year / 2,317.4 / 11.0 / 0.836 / 86.1
Outlet	-	The subcatchment runoff receiving node which is the same location as per the 2010 Master Plan. New areas have been allocated to the lowest elevation major system node in the catchment.
Area	ha	The area is calculated internally by PCSWMM through GIS and is the same as the 2010 Master Plan value used.

Parameter	Units	Description
Width / Flow Length	m	The width parameter has been taken from the 2010 Master Plan where the catchment has remained unchanged from 2010. For the regular shaped new subcatchments the width parameter has been calculated as the length perpendicular to overland flow direction within subcatchment. The width parameter of any new irregular shaped subcatchment are calculated to take in the account for skew within the subcatchment using the approach proposed by Guo and Urbonas (2007) (refer to EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016)).
Slope	%	Slopes are from the 2010 Master Plan except where noted in the comments. Some subcatchments had 0 slope in 2010 and a shallow slope of 0.2 has been used in the PCSWMM model to obtain similar peak flows as 2010. Three of the large agricultural subcatchments, noted in the model descriptions, have had slopes altered to provide similar flows to the 2010 model.
Imperv	%	For subcatchments from the 2010 Master Plan the Imperv is the directly and indirectly connected imperviousness used in the model. For new areas this value has been calculated based on impervious land cover. **Land Cover** — **IMP %** Agricultural — 8 EXTERNAL W/ SOME URBAN — 13 ICI - Heavy Clay — 94 Mixed LD RES with Commercial. — 40 Open Spaces — 8 Residential - LD Cul-Sac — 67 Residential - LD Heavy Clay — 70 School — 64
N Imperv	-	A constant of 0.013 is selected as the Manning's N for impervious surfaces such as roads, sidewalk and parking areas. The value is representative of smooth impervious surface as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).
N Perv	-	A constant of 0.25 is used as the Manning's N for pervious areas. The value is representative of light to tense turf land cover as per Table 3-5 of the EPA Storm Water Management Model Reference Manual Vol I – Hydrology (EPA, 2016).

Parameter	Units	Description
DStore Imperv	mm	A standard value of 1.57 mm is used as the impervious depression storage.
DStore Perv	mm	The pervious depression storage is linked to the Curve Number (CN) and Soil Storage (S) using the following relationship: **CN** — **DStore Perv** ≤ 70 — 0.075*S > 70 ≤ 80 — 0.10*S > 80 ≤ 90 — 0.155*S > 90 — 0.2*S Note: $S = \frac{25400}{CN} - 254$
Zero Imperv	%	Across areas of water it is considered that there is no depression storage. This value has been set to 0.
Subarea Routing	-	For subcatchments in the 2010 Master Plan the subrouting is either to PERVIOUS or IMPERVIOUS in accordance with the pervious model. The value is the receiving subarea of flow from other subareas in the catchment. For new subcatchments the constant 'PERVIOUS' is entered to simulate the subarea of impervious surface which may flow over pervious areas prior to discharging to the outlet of the subcatchment.
Percent Routed	%	The percent of routed subarea is taken from the 2010 Master Plan for each catchment. For new subcatchments this is estimated based on direction of runoff from impervious areas in the new development areas. **Land Cover** — **%IMP to PERVIOUS** — **% PERV. to IMP** Agricultural — 62.5 — 0 EXTERNAL W/ SOME URBAN — 0 — 17.2 ICI - Heavy Clay — 0 — 100 Mixed LD RES with Commercial. — 15 — 0 Open Spaces — 75 — 0 Residential - LD Cul-Sac — 15 — 0 Residential - LD Heavy Clay — 6 — 0 School — 0 — 100

Parameter	Units	Description
CN Value	-	The following CN values have been used based on the soil type from the OMAFRA mapping and the land cover. The OMAFRA mapping indicated that soils of hydrologic soil group C and D are prevalent in the area. In the urban areas a soil class D was assumed. **Land Cover** / **C CN Value** / **D CN Value** Agricultural: 79, 84 EXTERNAL W/ SOME URBAN: 79, 84 ICI - Heavy Clay: 76, 81 Mixed LD RES with Commercial.: 71, 78 Open Spaces: 71, 78 Residential - LD Cul-Sac: 71, 78 Residential - LD Heavy Clay: 71, 78 School: 71, 78 The CN value was area weighted based on the percentage of soil class in the subcatchment. A modified CN value (CN*) was calculated for each subcatchment to account for the difference in initial abstraction from the standard value of 0.2S.
Drying Time	days	The time for a fully saturated soil to completely dry is set at 7 days though this is not used in design event analysis.

The parameters Curb Length, Snow Pack, LID Controls, Groundwater and Erosion are not used in the model.

A2.0 Link Elements

A2.1 Conduits

Conduits represent either open channels or culverts.

Parameter	Units	Description / Values
Name	-	Conduits taken from the 2010 Master Plan maintain the same name which appears to be linked to one of the connecting nodes. New conduits are named based on the supplied GIS data.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.

Parameter	Units	Description / Values
Tag	-	Conduits are tagged as follows which is consistent with the type in the 2010 Master Plan model: **Tag** — **Description** Storm_Sewer — Underground piped infrastructure FUT_Storm_Sewer — Underground piped infrastructure of future development Street — Flow through streets Culvert — Piped flow with open channel flow either side SWMF_Outlet — Outlet Pipe from Stormwater Management Facility (SWMF) Overland — Open channel flow
Length	m	Length is auto-calculated in PCSWMM and is consistent with the 2010 Master Plan except for new links.
Roughness	-	For links from the 2010 Master Plan the roughness coefficient is maintained. For new sections the roughness coefficient of 0.013 is used for all sewer and culverts links. For channels the roughness coefficient of 0.035 is used for the channel.
Inlet Offset	m	Inlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Outlet Offset	m	Outlet elevation of the conduit element. Consistent with the 2010 Master Plan or the supplied GIS data for new links.
Initial Flow	m^3/s	No initial flows are set in the model
Flow Limit	m^3/s	No flow limits are set in the model
Entry Loss Coeff.	-	Culvert entry losses are dependent on the type of inlet used and are consistent with the 2010 Master Plan.

Parameter	Units	Description / Values
Exit Loss Coeff.	-	Exit loss coefficients are applied to culverts to simulate the losses to open channel flow and are consistent with the losses applied in the 2010 Master Plan. Sewer losses are dependent on the change in direction of flow **Angle (deg) — Loss Coef.** 0 — 0.02 10 — 0.045 20 — 0.118 30 — 0.21 40 — 0.325 50 — 0.46 60 — 0.635 70 — 0.84 80 — 1.065 90 — 1.32 No losses are applied to overland or street flow.
Ave. Loss Coeff.	-	The average loss coefficient is not used in this model.
Seepage Rate	mm/hr	There is no seepage applied to conduits in this model.
Flap Gate	-	No flapgates are used in the model.
Cross Section	-	Cross sections are generally circular for sewers, rectangular for streets, trapezoidal for open channel flow and either circular, elliptical or rectangular for cuvlerts. Cross sections are consistent with the 2010 Master Plan.
Geom1	m	**Type — Description** Circular — Pipe diameter Rectangular — Maximum Depth Trapezoidal — Maximum Depth Ellipse — Maximum Depth or Standard Size ID
Geom2	m	**Type — Description** Circular — Not used Rectangular — Bottom Width Trapezoidal — Bottom Width Ellipse — Maximum Width or not used

Parameter	Units	Description / Values
Geom3	m/m	**Type** / **Description** Circular / Not used Rectangular / Not used Trapezoidal / Left slope Ellipse / Not used
Geom4	m/m	**Type** / **Description** Circular / Not used Rectangular / Not used Trapezoidal / Right slope Ellipse / Not used
Barrels	-	The number of identical sewers within the conduit, usually 1.
Transect	-	Refers to transect data, if used, for the open channel links.
Shape Curve	-	Not used in this model
Culvert Code	-	The culvert code is used for culvert inlet links to ensure that the model treats the link as a culvert opening. Culvert codes have been selected to maintain consistency with the culvert coefficients used in the 2010 Master Plan.

A2.2 Weirs

Weirs have been used to carry overland flow through urban flow routes and across roads where culverts are overtopped. They are consistent in location with the 2010 Master Plan.

Parameter	Units	Description / Values
Name	-	Weirs maintain the same name as per the 2010 Master Plan which appears to be linked to one of the connecting nodes.
Inlet Node	-	Upstream node of the link element.
Outlet Node	-	Downstream node of the link element.
Tag	-	No tags used.
Type	-	All weirs links are transverse weirs where a rectangular cross section is perpendicular to the direction of flow.

Parameter	Units	Description / Values
Height	m	Maximum height of weir flow, consistent with Rim Elevation of the Inlet Node.
Length	m	Opening width of the weir.
Side Slope	m/m	Not used for rectangular transverse weirs
Inlet Elevation	m	Elevation of the crest of the weir.
Discharge Coefficient	-	Standard value of 0.85 in SI units used to represent a broad crested weir structure.
Flap Gate	-	No flap gates are applied.
End Contractions	-	Not used as consistent with the 2010 Master Plan.
End Coefficient	m^3/s	Not used as consistent with the 2010 Master Plan.
Can surcharge	-	Weirs have not been allowed to surcharge in order to represent free flow conditions in open channel flow.

A2.3 Outlets

These have been added in the model from the 2010 Master Plan. In Infoworks CS the major and minor system can be connected at the same node. In SWMM models the major and minor system must have separate nodes and be connected via an outlet link which represents catchbasin or multiple catchbasin inflows. The flows into the minor system are therefore under greater control in the updated SWMM model and may affect the behaviour of the system.

Parameter	Units	Description / Values
Name	-	Naming is based on the inlet node.
Inlet Node	-	Inlet node of the outlet link (the major system).
Outlet Node	-	Receiving node of the outlet link (minor system).
Tag	-	No tags used.
Inlet Elevation	m	The inlet elevation is set as the invert of the major system node.

<table>
<tr><th>Parameter</th><th>Units</th><th>Description / Values</th></tr>
<tr><td>Flap Gate</td><td>-</td><td>No flapgate restrictions are set so that backflow from the minor system into the major is allowed.</td></tr>
<tr><td>Rating Curve</td><td>-</td><td>All rating curves are set as TABULAR/HEAD in order that the minor system HGL affects the inlet capacity of the system. The curves are created using the inlet rating curve of a standard catchbasin grate and/or 600mm x 600mm ditch inlet grate. The curve data contains the number of catchbasins and ditch inlets lumped in each rating curve.
<table>
<tr><th>Head above grate (m)</th><th>Catchbasin Inlet Capacity (m³/s)</th><th>Ditch Inlet Capacity (m³/s)</th></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0.01</td><td>0.002</td><td>0.012</td></tr>
<tr><td>0.015</td><td>0.002</td><td>0.013</td></tr>
<tr><td>0.021</td><td>0.003</td><td>0.016</td></tr>
<tr><td>0.03</td><td>0.005</td><td>0.018</td></tr>
<tr><td>0.04</td><td>0.006</td><td>0.023</td></tr>
<tr><td>0.05</td><td>0.008</td><td>0.027</td></tr>
<tr><td>0.054</td><td>0.010</td><td>0.028</td></tr>
<tr><td>0.06</td><td>0.013</td><td>0.03</td></tr>
<tr><td>0.08</td><td>0.022</td><td>0.04</td></tr>
<tr><td>0.09</td><td>0.034</td><td>0.045</td></tr>
<tr><td>0.1</td><td>0.048</td><td>0.053</td></tr>
<tr><td>0.104</td><td>0.052</td><td>0.054</td></tr>
<tr><td>0.11</td><td>0.06</td><td>0.06</td></tr>
<tr><td>0.14</td><td>0.08</td><td>0.081</td></tr>
<tr><td>0.15</td><td>0.085</td><td>0.09</td></tr>
<tr><td>0.16</td><td>0.09</td><td>0.099</td></tr>
<tr><td>0.17</td><td>0.095</td><td>0.105</td></tr>
<tr><td>0.2</td><td>0.097</td><td>0.12</td></tr>
<tr><td>0.3</td><td>0.1</td><td>0.237</td></tr>
<tr><td>1</td><td>0.1</td><td>0.9</td></tr>
</table>
Rating curve for 1200mm x 600mm ditch inlet representing the outlet structure at JM_Pond_2 was obtained for as-built information (DWG: 0674-SWM2 - Phase 2 Development-Upper Canada Consultants) and Chart 4.20 ‘Ditch Inlet Capacity’ from MTO Drainage Manual:
<table>
<tr><th>Head above grate (m)</th><th>Ditch Inlet Capacity (m³/s)</th></tr>
<tr><td>0</td><td>0.0000</td></tr>
<tr><td>0.02</td><td>0.0216</td></tr>
<tr><td>0.06</td><td>0.0540</td></tr>
</table></td></tr>
</table>

Parameter	Units	Description / Values
		0.1 0.1080 0.2 0.3360 0.3 0.7200 0.4 1.3200 0.5 2.0400
Curve Name	-	The name of the lumped curve used for the outlet link.

A3.0 Node elements

A3.1 Junctions

Junctions are used to connect the links and have no hydraulic properties associated with them.

Parameter	Units	Description / Values
Name	-	Naming as per 2010 Master Plan or standard naming convention for new nodes.
Tag	-	No tags used for junction nodes.
Inflows	-	No additional inflows to the system are modelled.
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevation of the node taken from 2010 Master Plan. For new nodes the invert elevation is based on grading for major system nodes.
Rim Elevation	m	Elevation at the top of the node based on the depth of the connecting links, generally taken from the 2010 Master Plan or updated for connectivity. New nodes it is set on the depth of the adjoining conduits.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are used if there is backwater in the system at the start of the simulation. It is not used in this model as there is no downstream backwater control.
Surcharge Depth	m	No surcharge depth is applied.

Parameter	Units	Description / Values
Ponded Area	m²	No ponded areas are set in the model.

A3.2 Storage

Storage nodes are used to represent manholes in the system, sag storage in the surface along street sections or natural/man-made storage facilities.

Parameter	Units	Description / Values
Name	-	Naming is as per 2010 Master Plan except the major and minor nodes have been separated so the minor system storage nodes have an STM- prefix.
Tag	-	Minor system manholes are tagged.
Inflows	-	No additional inflows to the system are modelled.
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevations are taken from the 2010 Master Plan except new nodes where it is based on GIS data or surface topography.
Rim Elevation	m	Elevation at the top of the node based on the depth of the connecting links. Taken from the 2010 Master Plan but updated at some locations to maintain connectivity.
Depth	m	The depth is internally calculated in PCSWMM as the difference between the invert and rim elevations.
Initial Depth	m	Initial depths are used if there is backwater in the system at the start of the simulation. It is not used here.
Ponded Area	m²	No ponded areas are set in the model.
Evaporation Factor	fraction	No evaporation is considered in design event analysis.

Parameter	Units	Description / Values
Storage Curve	-	For sag storage and manholes a FUNCTIONAL storage curve is selected where the constant value is the footprint of the storage. Manholes have an assumed storage of 1.13 m² representing a 1200 mm diameter manhole. Sag storage has a constant of 10m² as per the 2010 Master Plan. New areas use similar values. For natural or man-made storage facilities such as SWM facilities the storage curve is TABULAR and the curve is based on the area – depth relationship of the facility.

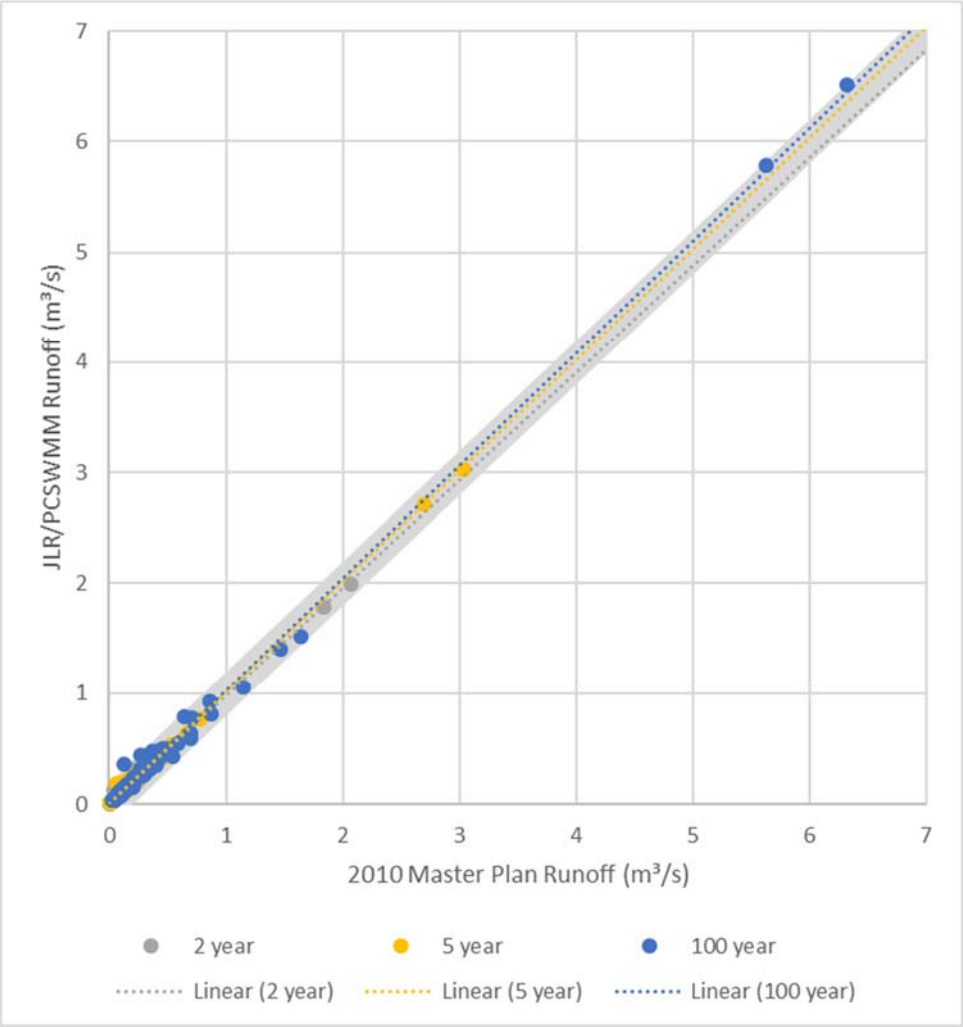
A3.3 Outfalls

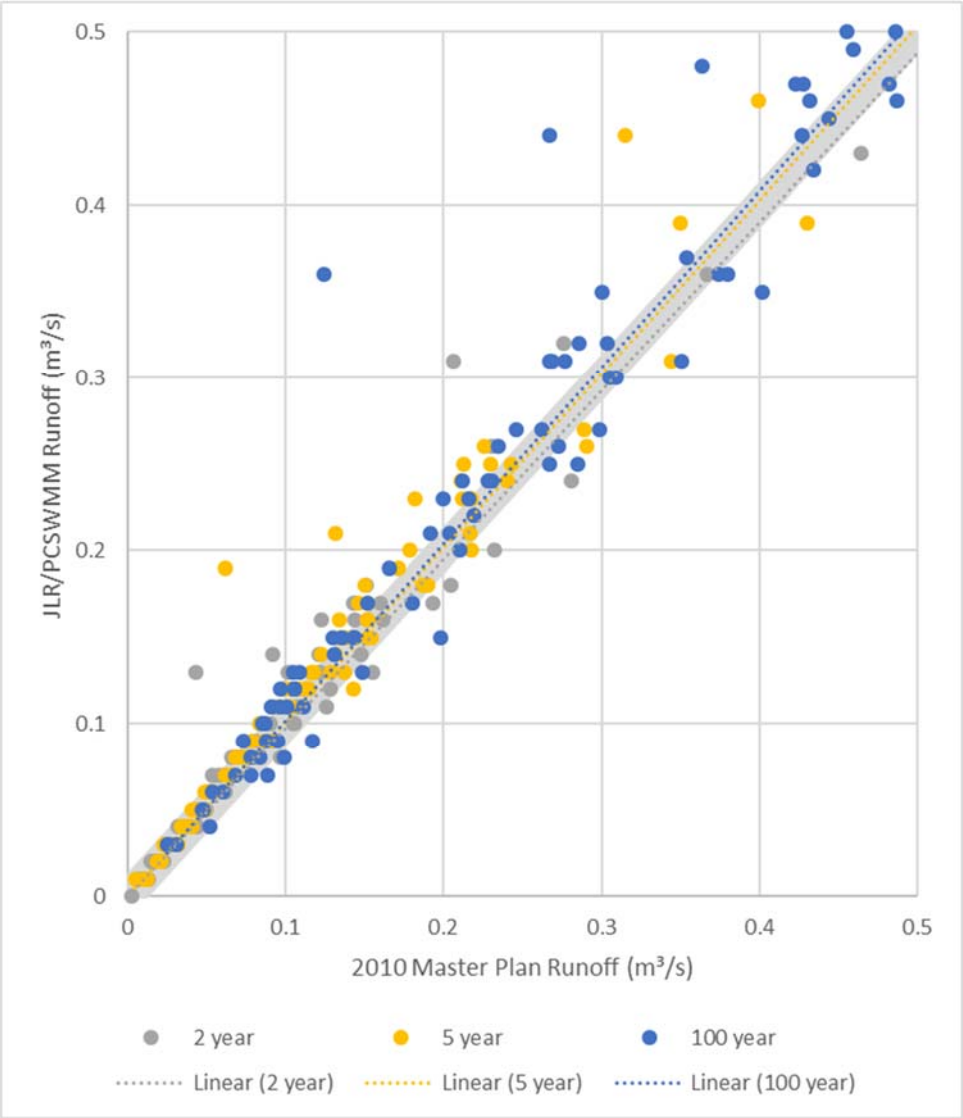
Parameter	Units	Description / Values
Name	-	Outfalls are named as per the 2010 Master Plan.
Tag	-	No tags were used for the outfalls.
Inflows	-	No external inflows are applied at outfall nodes
Treatment	-	No treatment is modelled
Invert Elevation	m	Invert elevation of the node is as per the 2010 Master Plan.
Rim Elevation	m	Elevation at the top of the node based on the depth of the connecting links.
Tide Gate	-	No backflow is prevented in the model outfalls and therefore 'No' is selected.
Route To	-	If flow from the outfall is directed to another subcatchment but this is not done in the model and this parameter is left blank.
Type	-	All outfalls have NORMAL outfall type which means depth of flow at the outlet is not affected by downstream conditions.

A4.0 Model Comparison

The results of the PCSWMM model can be compared to the 2010 Master Plan results for each subcatchment to confirm the appropriateness of the PCSWMM simulation. The graph in the figure below shows the runoff for each subcatchment in the 2010 Master Plan against the runoff

in the PCSWMM model. The majority of the subcatchments have runoff values similar (within the grey line) to the previous model. The graph confirms that the PCSWMM model represents the runoff within the study area to a similar degree as the 2010 Master Plan.




0.5
0.4
0.3
0.2
0.1
0
JLR/PCSWMM Runoff (m³/s)
0
0.1
0.2
0.3
0.4
0.5
2010 Master Plan Runoff (m³/s)
2 year
5 year
100 year
Linear (2 year)
Linear (5 year)
Linear (100 year)

Existing Condition Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60CBMH0018	60CBMH0018_OUT	0.86	70	52.4	0.0002	Residential - LD Heavy Clay	0.09	0.13	0.26
60CBMH0026	60CBMH0026_OUT	0.83	70	51.3	0.0006	Residential - LD Heavy Clay	0.1	0.14	0.27
60CBMH0037	60CBMH0037_OUT	2.48	70	88.8	0.0007	Residential - LD Heavy Clay	0.26	0.39	0.78
60CBMH0069	60CBMH0069_OUT	0.07	70	14.9	0.0027	Residential - LD Heavy Clay	0.01	0.01	0.03
60CBMH0070	60CBMH0070_OUT	1.03	70	83.85	0.0007	Residential - LD Heavy Clay	0.13	0.19	0.36
60CBMH0072	60CBMH0072_OUT	0.2	70	25	0.0027	Residential - LD Heavy Clay	0.03	0.04	0.07
60CBMH0074	60CBMH0074_OUT	0.41	70	36.1	0.0022	Residential - LD Heavy Clay	0.05	0.08	0.15
60CBMH0075	60CBMH0075_OUT	0.23	70	26.9	0.0004	Residential - LD Heavy Clay	0.03	0.04	0.08
60CBMH0077	60CBMH0077_OUT	0.36	67	33.6	0.0024	Residential - LD Cul-Sac	0.04	0.06	0.13
60CBMH0079	60CBMH0079_OUT	0.07	70	14.8	0.0052	Residential - LD Heavy Clay	0.01	0.01	0.03
60CBMH0082	60CBMH0082_OUT	0.62	70	44.4	0.0026	Residential - LD Heavy Clay	0.08	0.12	0.23
60CBMH0082.1	60STCB0082_OUT	0.74	70	48.4	0.0008	Residential - LD Heavy Clay	0.09	0.13	0.26
60CBMH0142	60CBMH0142_OUT	1.06	94	58.1	0.0005	ICI - Heavy Clay	0.16	0.23	0.46
60CBMH2000	60CBMH2000_OUT	1.5	70	59.083	0.0007	Residential - LD Heavy Clay	0.16	0.24	0.47
60CULV2002.4	60CULV2002d	0.14	70	20.8	0.0015	Residential - LD Heavy Clay	0.02	0.03	0.05
60CULV2013.1	60STOF2008	0.71	70	47.6	0.0005	Residential - LD Heavy Clay	0.08	0.12	0.24
60DICB0080	60DICB0080_OUT	0.29	70	30.1	0.0014	Residential - LD Heavy Clay	0.04	0.05	0.11
60DICB0081	60DICB0081_OUT	0.66	70	45.7	0.0013	Residential - LD Heavy Clay	0.08	0.12	0.24
60DICB0128	60DICB0128_OUT	0.45	67	37.6	0.0013	Residential - LD Cul-Sac	0.05	0.07	0.15
60DICB0198	60DICB0198_OUT	0.37	67	34.3	0.0013	Residential - LD Cul-Sac	0.04	0.06	0.13
60RYCB2000	60RYCB2000_OUT	0.86	8	52.4	0.0004	Open Spaces	0	0.01	0.03
60STCB0002	60STCB0002_OUT	3.29	13	102.3	0.0006	EXTERNAL DRAINAGE W/ SOME URBAN	0.09	0.12	0.25
60STCB0008	60STCB0008_OUT	2.5	13	89.3	0.0008	EXTERNAL DRAINAGE W/ SOME URBAN	0.07	0.09	0.2
60STCB0023	60STCB0023_OUT	1.61	40	71.5	0.0011	Mixed LD RES with Commercial.	0.11	0.15	0.31
60STCB0038	60STCB0038_OUT	6.48	13	143.6	0.0004	EXTERNAL DRAINAGE W/ SOME URBAN	0.16	0.23	0.46
60STCB0044	60STCB0044_OUT	1.13	94	60.1	0.0005	ICI - Heavy Clay	0.16	0.25	0.49
60STCB0045	60STCB0045_OUT	1.56	40	70.4	0.002	Mixed LD RES with Commercial.	0.11	0.15	0.31
60STCB0049	60STCB0049_OUT	0.29	70	30.2	0.0045	Residential - LD Heavy Clay	0.04	0.06	0.12
60STCB0051	60STCB0051_OUT	0.13	70	20.7	0.0004	Residential - LD Heavy Clay	0.02	0.03	0.05
60STCB0055	60STCB0055_OUT	0.58	40	42.8	0.0013	Mixed LD RES with Commercial.	0.04	0.06	0.12
60STCB0057	60STCB0057_OUT	0.45	40	38	0.0018	Mixed LD RES with Commercial.	0.03	0.05	0.1
60STCB0059	60STCB0059_OUT	0.39	40	35.1	0.0017	Mixed LD RES with Commercial.	0.03	0.04	0.09
60STCB0060	60STCB0060_OUT	0.6	40	43.8	0.0002	Mixed LD RES with Commercial.	0.04	0.06	0.11
60STCB0061	60STCB0061_OUT	0.55	40	41.7	0.0013	Mixed LD RES with Commercial.	0.04	0.05	0.11
60STCB0064	60STCB0054	0.68	94	46.4	0.0012	ICI - Heavy Clay	0.12	0.17	0.32
60STCB0068	60STCB0068_OUT	0.47	40	38.6	0.0005	Mixed LD RES with Commercial.	0.03	0.05	0.09
60STCB0073	60STCB0073_OUT	1.8	40	75.8	0.0002	Mixed LD RES with Commercial.	0.1	0.15	0.3
60STCB0075	60STCB0075_OUT	1.19	64	61.7	0.0008	School	0.14	0.2	0.37
60STCB0078	60STCB0064_OUT	0.35	94	33.2	0.0025	ICI - Heavy Clay	0.07	0.09	0.17
60STCB0079	60STCB0079_OUT	0.57	40	42.7	0.0021	Mixed LD RES with Commercial.	0.04	0.06	0.12
60STCB0082	60STCB0082_OUT	0.39	70	35.4	0.0008	Residential - LD Heavy Clay	0.05	0.07	0.14
60STCB0083	60STCB0078_OUT	0.33	94	32.2	0.0006	ICI - Heavy Clay	0.06	0.08	0.15
60STCB0088	60STCB0088_OUT	1.24	70	62.7	0.0002	Residential - LD Heavy Clay	0.12	0.18	0.36
60STCB0090	60STCB0097_OUT	0.59	70	43.4	0.0015	Residential - LD Heavy Clay	0.08	0.11	0.21
60STCB0097	60STCB0103	0.67	70	46.2	0.0013	Residential - LD Heavy Clay	0.09	0.12	0.23
60STCB0098	60STCB0098_OUT	1.4	70	66.8	0.0005	Residential - LD Heavy Clay	0.15	0.23	0.44
60STCB0101	60STCB0101_OUT	0.51	70	40.2	0.0083	Residential - LD Heavy Clay	0.07	0.1	0.19
60STCB2000	60STCB2000_OUT	0.72	70	47.9	0.001	Residential - LD Heavy Clay	0.09	0.13	0.24
60STMH0008	60STMH0008_OUT	0.28	40	29.7	0.002	Mixed LD RES with Commercial.	0.02	0.03	0.06
60STMH0009	60STMH0009_OUT	0.26	70	28.6	0.0019	Residential - LD Heavy Clay	0.03	0.05	0.1
60STMH0010	60STMH0010_OUT	0.44	70	37.2	0.0003	Residential - LD Heavy Clay	0.05	0.08	0.15
60STMH0011	60STMH0011_OUT	0.27	70	29.2	0.0124	Residential - LD Heavy Clay	0.04	0.05	0.11
60STMH0014	60STMH0014_OUT	0.97	70	55.5	0.001	Residential - LD Heavy Clay	0.12	0.17	0.32
60STMH0015	60STMH0015_OUT	0.63	70	44.9	0.0005	Residential - LD Heavy Clay	0.08	0.11	0.21
60STMH0016	60STMH0016_OUT	0.71	70	47.6	0.0005	Residential - LD Heavy Clay	0.08	0.12	0.24
60STMH0017	60STMH0017_OUT	0.68	70	46.6	0.0005	Residential - LD Heavy Clay	0.08	0.12	0.22
60STMH0019	60STMH0019_OUT	0.46	40	38.1	0.0011	Mixed LD RES with Commercial.	0.03	0.04	0.1
60STMH0020	60STMH0020_OUT	0.84	70	51.8	0.0022	Residential - LD Heavy Clay	0.11	0.16	0.31
60STMH0193	60STMH0193_OUT	0.95	70	55.1	0.0053	Residential - LD Heavy Clay	0.13	0.18	0.35
60STMH2000	60STMH2000_OUT	1.5	70	69.2	0.001	Residential - LD Heavy Clay	0.18	0.26	0.5
DICB026	DICB026_OUT	0.17	70	23.5	0.0006	Residential - LD Heavy Clay	0.02	0.03	0.06
60CULV2003.1	60CULV2004c	1.54	70	70	0.0002	Residential - LD Heavy Clay	0.14	0.21	0.44
60CULV2004.1	60CULV2004a	16.73	13	230.8	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.36	0.53	1.05
60CULV2006.1	60CULV2006	370.79	8	1086.4	0.0015	Agricultural	1.79	2.71	5.78
60CULV2000.1	60CULV2000	21.39	8	260.9	0.0009	Agricultural	0.13	0.19	0.45
60CULV2000.4	60SWALE2001b	1.41	70	66.9	0.0017	Residential - LD Heavy Clay	0.17	0.25	0.47
60CULV2001.2	60CULV2001	1.22	70	62.2	0.0002	Residential - LD Heavy Clay	0.11	0.18	0.36
60CULV2005.1	60CULV2005b	1.64	94	72.1	0.0209	ICI - Heavy Clay	0.31	0.44	0.79
60CULV2005.4	60STOV2009	1.18	70	61.2	0.0209	Residential - LD Heavy Clay	0.16	0.23	0.48
60CULV2007.1	60CULV2006d	4.48	13	119.4	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.11	0.16	0.31
60CULV2008.1	60CULV2007d	2.6	40	91	0.0002	Mixed LD RES with Commercial.	0.14	0.21	0.42
60CULV2009.1	60CULV2008d	1.78	40	75.3	0.0002	Mixed LD RES with Commercial.	0.1	0.15	0.3
60CULV2011.4	60CULV2011d	9.22	8	171.3	0.0002	Open Spaces	0.04	0.05	0.13
60CULV2012.4	60CULV2012d	3.23	64	101.4	0.0002	School	0.24	0.39	0.81
60CULV2013.4	60STOF2009_OUT	1.85	8	76.7	0.0001	Open Spaces	0.01	0.01	0.04
60STOF2000a	J4	1.04	13	57.6	0.0003	EXTERNAL DRAINAGE W/ SOME URBAN	0.03	0.04	0.08
60STOF2004a	60STOF2004a_OUT	0.51	40	40.3	0.0002	Mixed LD RES with Commercial.	0.03	0.05	0.09

Existing Condition Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60STOF2007	60CULV2010d	1.21	94	62	0.0004	ICI - Heavy Clay	0.17	0.25	0.5
60STOF2009	60STOF2009_OUT	27.28	8	294.7	0.0001	Agricultural	0.13	0.2	0.43
60STOV2001	60STOV2001_OUT	2.01	70	79.9	0.0002	Residential - LD Heavy Clay	0.17	0.26	0.55
60STOV2002	60STOV2002_OUT	6.41	8	142.8	0.0002	Open Spaces	0.03	0.04	0.09
60STOV2011	60STOV2011_OUT	0.91	70	53.7	0.0001	Residential - LD Heavy Clay	0.08	0.12	0.25
60STOV2016	60STOV2016_OUT	0.77	70	49.5	0.0011	Residential - LD Heavy Clay	0.1	0.14	0.27
60SWALE2002.1	60SWALE2002	3.49	8	105.5	0.0002	Open Spaces	0.01	0.02	0.07
60SWALE2003a	60SWALE2003a_OUT	0.91	13	53.9	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.02	0.03	0.07
60SWALE2004.1	60SWALE2004a	7.68	8	156.4	0.0002	Agricultural	0.04	0.07	0.15
60SWALE2004.1.9	60SWALE2004a	0.55	70	41.9	0.0002	Residential - LD Heavy Clay	0.06	0.09	0.17
CA_314,_315,_316	CA_314,_315,_316_OUT	231.21	8	857.9	0.0015	Agricultural	1.19	1.79	3.85
CULV025.1	60CULV2002e	3.86	8	110.8	0.0002	Open Spaces	0.02	0.02	0.08
EAST_OUTFALL	60CULV2012d	36.23	8	339.6	0.0002	Agricultural	0.18	0.27	0.59
north_culvert	north_culvert_a	12.24	13	197.4	0.0035	EXTERNAL DRAINAGE W/ SOME URBAN	0.32	0.46	0.93
Ultimate_Outlet_SE	CA_314,_315,_316_OUT	421.32	8	1158.1	0.0015	Agricultural	1.99	3.03	6.51
60STCB0107	60STCB0103	0.49	40	89.8	0.0023	Mixed LD RES with Commercial.	0.03	0.05	0.13
60STOF2000.4.1	60SWALE2003b	5.32	8	540	0.0003	Agricultural	0.03	0.06	0.3
60STOF2003-ex	60STOF2003	3.56	13	109.2	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.09	0.13	0.25
60STOV2006	60STOV2006.1	2.6	40	117.3	0.0002	Mixed LD RES with Commercial.	0.15	0.22	0.42
60UNCON0001	60UNCON0001_OUT	83.79	8	516.7	0.0005	Agricultural	0.43	0.64	1.4
CNR_culv_a	CNR_culv_a_OUT	25.1	13	282.4	0.0002	EXTERNAL DRAINAGE W/ SOME URBAN	0.5	0.76	1.52
JM'1'	60STMH0272_OUT	0.27	40	29.2	0.0004	Mixed LD RES with Commercial.	0.02	0.03	0.05
JM'2'	JM'2'_OUT	0.41	40	36	0.0001	Mixed LD RES with Commercial.	0.03	0.04	0.07
JM'3'	60STMH0279_OUT	0.29	40	30.4	0.0005	Mixed LD RES with Commercial.	0.02	0.03	0.05
JM'3b'	60STMH0279_OUT	0.44	40	37.5	0.0005	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM'4'	60STMH0282_OUT	0.25	8	28.2	0.0008	Open Spaces	0	0	0.01
JM'5'	60STMH0289_OUT	0.3	40	31	0.0006	Mixed LD RES with Commercial.	0.02	0.03	0.06
JM'6'	60STMH0303_OUT	0.45	40	37.7	0.0003	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM'7'	60STMH0300_OUT	0.2	40	25.1	0.0004	Mixed LD RES with Commercial.	0.01	0.02	0.04
JM'7'comm	60STMH0300_OUT	0.67	70	46	0.0004	Residential - LD Heavy Clay	0.08	0.11	0.22
JM'8'	60STMH0296_OUT	0.75	40	48.8	0.0001	Mixed LD RES with Commercial.	0.04	0.06	0.12
JM11	60STMH0339_OUT	0.6	40	43.6	0.0004	Mixed LD RES with Commercial.	0.04	0.06	0.11
JM12	60STMH0338_OUT	0.42	40	36.7	0.0004	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM16	60STMH0336_OUT	0.51	40	40.2	0.0002	Mixed LD RES with Commercial.	0.03	0.05	0.09
JM17	60STMH0335_OUT	0.62	40	44.2	0.0004	Mixed LD RES with Commercial.	0.04	0.06	0.11
JM18	60STMH0334_OUT	0.47	40	38.5	0.0001	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM19	60STMH0332_OUT	0.63	40	44.8	0.0023	Mixed LD RES with Commercial.	0.04	0.06	0.12
JM8	60STMH0341_OUT	0.43	40	37	0.0002	Mixed LD RES with Commercial.	0.03	0.04	0.08
JM_Pond_1	JSWMF-4	0.31	70	31.2	0.0001	Residential - LD Heavy Clay	0.03	0.05	0.1
JM_Pond_2	JSMF-5	1.07	70	58.4	0.0001	Residential - LD Heavy Clay	0.09	0.14	0.29
w1	w1_OUT	0.87	70	52.7	0.0008	Residential - LD Heavy Clay	0.11	0.15	0.29
w2	w2_OUT	0.5	70	39.7	0.0009	Residential - LD Heavy Clay	0.06	0.09	0.17
w3	w3_OUT	0.6	70	43.5	0.004	Residential - LD Heavy Clay	0.08	0.11	0.22
walker_SWM_FACILITY	JSWMF-3	0.63	70	44.8	0.0001	Residential - LD Heavy Clay	0.06	0.09	0.19
DN_8	J3	2.4	13	87.3	0.0001	EXTERNAL DRAINAGE W/ SOME URBAN	0.06	0.08	0.16
EX_S1	St_EX_S1	3.68	8	150	0.00211	Agricultural	0.02	0.05	0.24
60STOF2000.4.1_1	60CULV2012b	4.48	8	245	0.0003	Agricultural	0.03	0.04	0.17

Future Population Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60CBMH0018	60CBMH0018_OUT	0.863	70	52.4	0.2	Residential_-_LD_Heavy_Clay	0.09	0.13	0.26
60CBMH0026	60CBMH0026_OUT	0.827	70	51.3	0.6	Residential_-_LD_Heavy_Clay	0.1	0.14	0.27
60CBMH0037	60CBMH0037_OUT	2.477	70	88.8	0.7	Residential_-_LD_Heavy_Clay	0.26	0.39	0.78
60CBMH0069	60CBMH0069_OUT	0.07	70	14.9	2.7	Residential_-_LD_Heavy_Clay	0.01	0.01	0.03
60CBMH0070	60CBMH0070_OUT	1.032	70	83.85	0.7	Residential_-_LD_Heavy_Clay	0.13	0.19	0.36
60CBMH0072	60CBMH0072_OUT	0.197	70	25	2.7	Residential_-_LD_Heavy_Clay	0.03	0.04	0.07
60CBMH0074	60CBMH0074_OUT	0.41	70	36.1	2.2	Residential_-_LD_Heavy_Clay	0.05	0.08	0.15
60CBMH0075	60CBMH0075_OUT	0.227	70	26.9	0.4	Residential_-_LD_Heavy_Clay	0.03	0.04	0.08
60CBMH0077	60CBMH0077_OUT	0.355	67	33.6	2.4	Residential_-_LD_Cul-Sac	0.04	0.06	0.13
60CBMH0079	60CBMH0079_OUT	0.069	70	14.8	5.2	Residential_-_LD_Heavy_Clay	0.01	0.01	0.03
60CBMH0082	60CBMH0082_OUT	0.618	70	44.4	2.6	Residential_-_LD_Heavy_Clay	0.08	0.12	0.23
60CBMH0082.1	60STCB0082_OUT	0.736	70	48.4	0.8	Residential_-_LD_Heavy_Clay	0.09	0.13	0.26
60CBMH0142	60CBMH0142_OUT	1.06	94	58.1	0.5	ICI_-_Heavy_Clay	0.16	0.23	0.46
60CBMH2000	60CBMH2000_OUT	1.499	70	59.083	0.7	Residential_-_LD_Heavy_Clay	0.16	0.24	0.47
60CULV2002.4	60CULV2002d	0.135	70	20.8	1.5	Residential_-_LD_Heavy_Clay	0.02	0.03	0.05
60CULV2013.1	M_CULV_c	0.712	70	47.6	0.5	Residential_-_LD_Heavy_Clay	0.08	0.12	0.24
60DICB0080	60DICB0080_OUT	0.285	70	30.1	1.4	Residential_-_LD_Heavy_Clay	0.04	0.05	0.11
60DICB0081	60DICB0081_OUT	0.657	70	45.7	1.3	Residential_-_LD_Heavy_Clay	0.08	0.12	0.24
60DICB0128	60DICB0128_OUT	0.445	67	37.6	1.3	Residential_-_LD_Cul-Sac	0.05	0.07	0.15
60DICB0198	60DICB0198_OUT	0.369	67	34.3	1.3	Residential_-_LD_Cul-Sac	0.04	0.06	0.13
60RYCB2000	60RYCB2000_OUT	0.861	8	52.4	0.4	Open_Spaces	0	0.01	0.03
60STCB0002	60STCB0002_OUT	3.29	13	102.3	0.6	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.09	0.12	0.25
60STCB0008	60STCB0008_OUT	2.503	13	89.3	0.8	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.07	0.09	0.2
60STCB0023	60STCB0023_OUT	1.606	40	71.5	1.1	Mixed_LD_RES_with_Commercial.	0.11	0.15	0.31
60STCB0038	60STCB0038_OUT	6.476	13	143.6	0.4	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.16	0.23	0.46
60STCB0044	60STCB0044_OUT	1.134	94	60.1	0.5	ICI_-_Heavy_Clay	0.16	0.25	0.49
60STCB0045	60STCB0045_OUT	1.556	40	70.4	2	Mixed_LD_RES_with_Commercial.	0.11	0.15	0.31
60STCB0049	60STCB0049_OUT	0.286	70	30.2	4.5	Residential_-_LD_Heavy_Clay	0.04	0.06	0.12
60STCB0051	60STCB0051_OUT	0.134	70	20.7	0.4	Residential_-_LD_Heavy_Clay	0.02	0.03	0.05
60STCB0055	60STCB0055_OUT	0.575	40	42.8	1.3	Mixed_LD_RES_with_Commercial.	0.04	0.06	0.12
60STCB0057	60STCB0057_OUT	0.453	40	38	1.8	Mixed_LD_RES_with_Commercial.	0.03	0.05	0.1
60STCB0059	60STCB0059_OUT	0.386	40	35.1	1.7	Mixed_LD_RES_with_Commercial.	0.03	0.04	0.09
60STCB0060	60STCB0060_OUT	0.603	40	43.8	0.2	Mixed_LD_RES_with_Commercial.	0.04	0.06	0.11
60STCB0061	60STCB0061_OUT	0.547	40	41.7	1.3	Mixed_LD_RES_with_Commercial.	0.04	0.05	0.11
60STCB0064	60STCB0054	0.678	94	46.4	1.2	ICI_-_Heavy_Clay	0.12	0.17	0.32
60STCB0068	60STCB0068_OUT	0.467	40	38.6	0.5	Mixed_LD_RES_with_Commercial.	0.03	0.05	0.09
60STCB0073	60STCB0073_OUT	1.803	40	75.8	0.2	Mixed_LD_RES_with_Commercial.	0.1	0.15	0.3
60STCB0075	60STCB0075_OUT	1.194	64	61.7	0.8	School	0.14	0.2	0.37
60STCB0078	60STCB0064_OUT	0.346	94	33.2	2.5	ICI_-_Heavy_Clay	0.07	0.09	0.17
60STCB0079	60STCB0079_OUT	0.572	40	42.7	2.1	Mixed_LD_RES_with_Commercial.	0.04	0.06	0.12
60STCB0082	60STCB0082_OUT	0.393	70	35.4	0.8	Residential_-_LD_Heavy_Clay	0.05	0.07	0.14
60STCB0083	60STCB0078_OUT	0.325	94	32.2	0.6	ICI_-_Heavy_Clay	0.06	0.08	0.15
60STCB0088	60STCB0088_OUT	1.237	70	62.7	0.2	Residential_-_LD_Heavy_Clay	0.12	0.18	0.36
60STCB0090	60STCB0097_OUT	0.592	70	43.4	1.5	Residential_-_LD_Heavy_Clay	0.08	0.11	0.21
60STCB0097	60STCB0103	0.67	70	46.2	1.3	Residential_-_LD_Heavy_Clay	0.09	0.12	0.23
60STCB0098	60STCB0098_OUT	1.402	70	66.8	0.5	Residential_-_LD_Heavy_Clay	0.15	0.23	0.44
60STCB0101	60STCB0101_OUT	0.508	70	40.2	8.3	Residential_-_LD_Heavy_Clay	0.07	0.1	0.19
60STCB2000	60STCB2000_OUT	0.719	70	47.9	1	Residential_-_LD_Heavy_Clay	0.09	0.13	0.24
60STMH0008	60STMH0008_OUT	0.278	40	29.7	2	Mixed_LD_RES_with_Commercial.	0.02	0.03	0.06
60STMH0009	60STMH0009_OUT	0.257	70	28.6	1.9	Residential_-_LD_Heavy_Clay	0.03	0.05	0.1
60STMH0010	60STMH0010_OUT	0.435	70	37.2	0.3	Residential_-_LD_Heavy_Clay	0.05	0.08	0.15
60STMH0011	60STMH0011_OUT	0.268	70	29.2	12.4	Residential_-_LD_Heavy_Clay	0.04	0.05	0.11
60STMH0014	60STMH0014_OUT	0.969	70	55.5	1	Residential_-_LD_Heavy_Clay	0.12	0.17	0.32
60STMH0015	60STMH0015_OUT	0.632	70	44.9	0.5	Residential_-_LD_Heavy_Clay	0.08	0.11	0.21
60STMH0016	60STMH0016_OUT	0.713	70	47.6	0.5	Residential_-_LD_Heavy_Clay	0.08	0.12	0.24
60STMH0017	60STMH0017_OUT	0.682	70	46.6	0.5	Residential_-_LD_Heavy_Clay	0.08	0.12	0.22
60STMH0019	60STMH0019_OUT	0.455	40	38.1	1.1	Mixed_LD_RES_with_Commercial.	0.03	0.04	0.1
60STMH0020	60STMH0020_OUT	0.843	70	51.8	2.2	Residential_-_LD_Heavy_Clay	0.11	0.16	0.31
60STMH0193	60STMH0193_OUT	0.954	70	55.1	5.3	Residential_-_LD_Heavy_Clay	0.13	0.18	0.35
60STMH2000	60STMH2000_OUT	1.504	70	69.2	1	Residential_-_LD_Heavy_Clay	0.18	0.26	0.5
DICB026	DICB026_OUT	0.173	70	23.5	0.6	Residential_-_LD_Heavy_Clay	0.02	0.03	0.06
60CULV2003.1	60CULV2004c	1.54	70	70	0.2	Residential_-_LD_Heavy_Clay	0.14	0.21	0.44
60CULV2004.1	60CULV2004a	16.733	13	230.8	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.36	0.53	1.05
60STOV2011	60STOV2011_OUT	0.906	70	53.7	0.1	Residential_-_LD_Heavy_Clay	0.08	0.12	0.25
60STOV2016	60STOV2016_OUT	0.77	70	49.5	1.1	Residential_-_LD_Heavy_Clay	0.1	0.14	0.27
w1	w1_OUT	0.8723	70	52.7	0.8	Recent_Development	0.11	0.15	0.29
w2	w2_OUT	0.4962	70	39.7	0.9	Recent_Development	0.06	0.09	0.17
w3	w3_OUT	0.5954	70	43.5	4	Recent_Development	0.08	0.11	0.22
walker_SWM_FACILITY	JSWMF-3	0.6298	70	44.8	0.1	Recent_Development	0.06	0.09	0.19
60CULV2000.1	60CULV2000	21.387	8	260.9	0.9	Agricultural	0.13	0.19	0.45
60CULV2000.4	60SWALE2001b	1.407	70	66.9	1.7	Residential_-_LD_Heavy_Clay	0.17	0.25	0.47
60CULV2001.2	60CULV2001	1.215	70	62.2	0.2	Residential_-_LD_Heavy_Clay	0.11	0.18	0.36
60CULV2005.1	60CULV2005b	1.635	94	72.1	20.9	ICI_-_Heavy_Clay	0.31	0.44	0.79
60CULV2005.4	60STOV2009	1.177	70	61.2	20.9	Residential_-_LD_Heavy_Clay	0.16	0.23	0.48
60CULV2007.1	60CULV2006d	4.478	13	119.4	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.11	0.16	0.31
60CULV2008.1	60CULV2007d	2.603	40	91	0.2	Mixed_LD_RES_with_Commercial.	0.14	0.21	0.42
60CULV2009.1	60CULV2008d	1.781	40	75.3	0.2	Mixed_LD_RES_with_Commercial.	0.1	0.15	0.3

Future Population Storm Subcatchment Hydrologic Parameters

Name	Receiving Node	Area (ha)	%Imp	Width (m)	Slope (m/m)	Land Use and Soil	Model Peak Runoff Results (m^3/s)		
							1:2 year	1:5 year	1:100 year
60CULV2011.4	60CULV2011d	8.493	8	164.4	0.2	Open_Spaces	0.03	0.05	0.13
60CULV2013.4	60STOF2009_OUT	1.846	8	76.7	0.1	Open_Spaces	0.01	0.01	0.04
60STOF2000a	J4	1.041	13	57.6	0.3	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.03	0.04	0.08
60STOF2002.1	60STOF2002	0.374	13	34.5	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.01	0.01	0.03
60STOF2004a	60STOF2004a_OUT	0.511	40	40.3	0.2	Mixed_LD_RES_with_Commercial.	0.03	0.05	0.09
60STOF2007	60CULV2010d	1.207	94	62	0.4	ICI_-_Heavy_Clay	0.17	0.25	0.5
60STOV2001	60STOV2001_OUT	2.005	70	79.9	0.2	Residential_-_LD_Heavy_Clay	0.17	0.26	0.55
60STOV2002	60STOV2002_OUT	6.405	8	142.8	0.2	Open_Spaces	0.03	0.04	0.09
60SWALE2002.1	60SWALE2002	3.494	8	105.5	0.2	Open_Spaces	0.01	0.02	0.07
60SWALE2003a	60SWALE2003a_OUT	0.912	13	53.9	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.02	0.03	0.07
60SWALE2004.1	60SWALE2004a	7.681	8	156.4	0.2	Agricultural	0.04	0.07	0.15
60SWALE2004.1.9	60SWALE2004a	0.551	70	41.9	0.2	Residential_-_LD_Heavy_Clay	0.06	0.09	0.17
60UNCON0001	60UNCON0001_OUT	82.336	8	511.9	0.5	Agricultural	0.42	0.63	1.37
CA_314,_315,_316	CA_314,_315,_316_OUT	229.674	8	858.6	1.5	Agricultural	1.19	1.78	3.83
CNR_CULV_c.1	CNR_CULV_c	1.076	13	58.5	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.03	0.04	0.08
CULV025.1	60CULV2002e	3.857	8	110.8	0.2	Open_Spaces	0.02	0.02	0.08
Ultimate_Outlet_SE	CA_314,_315,_316_OUT	421.318	8	1158.1	1.5	Agricultural	1.99	3.03	6.51
D_SWM_FACILITY.1	D_SWM_FACILITY	0.989	40	56.1	0.2	Future_Development	0.06	0.09	0.17
D1	D1_OUT	1.284	40	63.9	0.2	Future_Development	0.07	0.11	0.21
D2	D2_OUT	2.029	40	80.4	0.3	Future_Development	0.12	0.17	0.33
D3	D3_OUT	1.191	40	61.6	24.8	Future_Development	0.08	0.12	0.25
JM1	JM1_OUT	1.097	40	59.1	0.1	Future_Development	0.06	0.09	0.17
JM10	JM10_OUT	0.537	40	41.3	0.1	Future_Development	0.03	0.05	0.09
JM13	JM13_OUT	1.106	40	59.3	0.1	Future_Development	0.06	0.09	0.18
JM14	JM14_OUT	1.055	40	57.9	0.6	Future_Development	0.07	0.1	0.19
JM2	JM2_OUT	0.512	40	40.4	0.1	Future_Development	0.03	0.05	0.09
JM3	JM3_OUT	0.76	40	49.2	0.6	Future_Development	0.05	0.07	0.14
JM4	JM4_OUT	0.811	40	50.8	0.1	Future_Development	0.05	0.07	0.13
JM5	JM5_OUT	1.092	40	58.9	0.1	Future_Development	0.06	0.09	0.18
JM6	JM6_OUT	0.652	40	45.5	0.1	Future_Development	0.04	0.06	0.11
JM7	JM7_OUT	0.568	40	42.5	0.1	Future_Development	0.03	0.05	0.1
M1	M1_OUT	0.564	70	42.4	3.3	Residential_-_LD_Heavy_Clay	0.08	0.11	0.22
M3	M3_OUT	0.784	67	49.9	1.7	Residential_-_LD_Cul-Sac	0.09	0.13	0.26
M4	M4_OUT	0.666	70	46	0.3	Residential_-_LD_Heavy_Clay	0.07	0.11	0.22
STCP-5	STCP-5_OUT	0.418	70	36.5	5.4	Residential_-_LD_Heavy_Clay	0.06	0.08	0.17
60CULV2006.1	60CULV2006	371.578	8	1086.4	1.5	Agricultural	1.79	2.71	5.79
CNR_culv_a	CNR_culv_a_OUT	18.1134	13	282.4	0.2	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.4	0.59	1.17
60STOF2009	60STOF2009_OUT	27.2955	8	294.7	0.1	Agricultural	0.13	0.2	0.43
north_culvert	north_culvert_a	12.2446	13	197.4	3.5	EXTERNAL_DRAINAGE_W/_SOME_URBAN	0.32	0.46	0.93
60STCB0107	60STCB0103	0.4906	40	89.8	2.3	Mixed_LD_RES_with_Commercial	0.03	0.05	0.13
60STOV2006	60STOV2006.1	2.5991	40	117.3	0.2	Mixed_LD_RES_with_Commercial	0.15	0.22	0.42
60STOF2000.4.1	60SWALE2003b	5.3221	8	540	0.3	Agricultural	0.03	0.06	0.3
DN_8	J3	2.3981	13	87.3	0.1	Recent_Development	0.06	0.08	0.16
JM_Pond_1	JSWMF-4	0.3066	70	31.2	0.1	Recent_Development	0.03	0.05	0.1
JM_Pond_2	JSMF-5	1.0719	70	58.4	0.1	Recent_Development	0.09	0.14	0.29
JM'1'	60STMH0272_OUT	0.2684	40	29.2	0.4	Recent_Development	0.02	0.03	0.05
JM11	60STMH0339_OUT	0.5988	40	43.6	0.4	Recent_Development	0.04	0.06	0.11
JM12	60STMH0338_OUT	0.4175	40	36.7	0.4	Recent_Development	0.03	0.04	0.08
JM16	60STMH0336_OUT	0.5073	40	40.2	0.2	Recent_Development	0.03	0.05	0.09
JM17	60STMH0335_OUT	0.6152	40	44.2	0.4	Recent_Development	0.04	0.06	0.11
JM18	60STMH0334_OUT	0.4668	40	38.5	0.1	Recent_Development	0.03	0.04	0.08
JM19	60STMH0332_OUT	0.6319	40	44.8	2.3	Recent_Development	0.04	0.06	0.12
JM'2'	JM'2'_OUT	0.4076	40	36	0.1	Recent_Development	0.03	0.04	0.07
JM'3'	60STMH0279_OUT	0.2909	40	30.4	0.5	Recent_Development	0.02	0.03	0.05
JM'3b'	60STMH0279_OUT	0.4418	40	37.5	0.5	Recent_Development	0.03	0.04	0.08
JM'4'	60STMH0282_OUT	0.2493	8	28.2	0.8	Recent_Development	0.00	0.00	0.01
JM'5'	60STMH0289_OUT	0.3025	40	31	0.6	Recent_Development	0.02	0.03	0.06
JM'6'	60STMH0303_OUT	0.4456	40	37.7	0.3	Recent_Development	0.03	0.04	0.08
JM'7'	60STMH0300_OUT	0.1988	40	25.1	0.4	Recent_Development	0.01	0.02	0.04
JM'7'comm	60STMH0300_OUT	0.6658	70	46	0.4	Recent_Development	0.08	0.11	0.22
JM8	60STMH0341_OUT	0.4298	40	37	0.2	Recent_Development	0.03	0.04	0.08
JM'8'	60STMH0296_OUT	0.7501	40	48.8	0.1	Recent_Development	0.04	0.06	0.12
E_Talbot	60CULV2012a	4.527	8	120	0.65	Agricultural	0.03	0.04	0.14
60CULV2012.4	60CULV2012d	3.232	64	101.4	0.2	School	0.24	0.39	0.81
EAST_OUTFALL	60CULV2012d	36.064	8	338.8	0.2	Agricultural	0.18	0.27	0.59

Appendix D

Transportation Report

5A-150 Pinebush Road
Cambridge ON N1R 8J8
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905.381.2229
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www.ptsl.com

20 March 2019
Project: 180197

Jane Wilson
Environmental Engineer
J.L. Richards & Associates Limited
107-450 Speedvale Avenue West
Guelph ON N1H 7Y6

Dear Ms. Wilson:

RE: JARVIS MASTER SERVICING PLAN – TRANSPORTATION COMPONENT, TECHNICAL MEMORANDUM 2, GROWTH FORECAST AND FUTURE NEEDS

Haldimand County is undertaking an update of the 2010 Master Servicing Plan (MSP) for the community of Jarvis in support of planned growth and intensification identified in the County's Official Plan. The updated MSP will address the four servicing components (transportation, storm, water and wastewater) of the 2010 Jarvis MSP corresponding to changes in land use and growth forecasts within the study area over the next twenty years, as well as changes to existing conditions and related assumptions based on growth that has occurred within the study area.

The study area for the update includes the network of municipal services, local environment, and community make up, consistent with the 2010 Jarvis MSP study area. The community of Jarvis is built along and adjacent to Highway 6 (Main Street) and Highway 3 (Talbot Street) in the southwest part of Haldimand County. The study area road system is centered on the intersection of Highway 6 and Highway 3 and is generally bounded by Haldimand Road 69 to the north, Haldimand Road 55 to the east, Haldimand Road 70 to the west, and Concession 6 Walpole to the south. Both Highway 6 and Highway 3 are "connecting links" in the Provincial highway network.

The MSP update, including transportation, is being undertaken within the following framework:

- Class Environmental Assessment Master Planning
- Background Review and Updates to Existing Conditions
- Growth Forecast and Assessment of Future Needs
- Development of Preferred Servicing Strategies
- Implementation Plan Development and Final Report

Technical Memorandum 1, dated 13 November 2018, provided background review and updates to existing conditions. The purpose of this memorandum (Technical Memorandum 2) is to contextualize the projected growth in the community and review the future transportation conditions alongside this forecast growth. A twenty-year planning horizon (2018-2038) is used for future growth forecasts and assessment of transportation impacts.

Future (2038) Traffic Conditions

Future (2028) Background Traffic Forecasts

The future traffic conditions in the study area are likely to comprise general traffic growth (i.e. traffic generated by development outside the study area) over ten years, and future development traffic based on land development in the study area. The 2038 background traffic was estimated by applying a general growth rate of one percent compounded per annum to the base year (2018) volumes This growth rate is based on historic traffic growth at Talbot Street and Main Street between 2012 and 2018

Figure 1 and **Figure 2** (attached) respectively illustrate the 2038 background traffic volumes for the weekday AM and PM peak hours.

Future (2038) Development Traffic Forecasts

The future development in the study area is anticipated to include 120 low-density, 34 medium-density, and 24 high-density residential units. **Figure 3** (attached) illustrates the location of the proposed development parcels. It is noted that some of this development is already underway; therefore, the trip generation estimates are considered conservative, as some of the forecast trips may already be included in the existing traffic counts. The trips generated by the development lands were estimated using trip generation rates for different land uses provided in the ITE Trip Generation Manual.[1] The following land use codes (LUC) have been referenced:

- LUC 210: Single Family Detached Residential;
- LUC 220: Multifamily Housing (Low-Rise); and
- LUC 221: Multifamily Housing (Mid-Rise).

The trip generation for these three uses were based on the regression equations. In total, the development of the land parcels shown in **Figure 3** are forecast to generate 154 new trips in the AM peak hour, and 149 trips in the PM peak hour. **Table 1** summarizes the trip generation estimates.

[1] Institute of Transportation Engineers. 2017. *Trip Generation Manual (10th Edition).* Washington D.C.

TABLE 1: TRIP GENERATION ESTIMATES

Land Parcel	Land Use Code	Units Allocated	AM Peak Hour				PM Peak Hour			
			Rate	In	Out	Total	Rate	In	Out	Total
Milmont Estates	LUC 220 - Multifamily Housing (Low-Rise)	34	Eqn. [2]	6	22	28	Eqn. [2]	14	9	23
Country Fields Phase 1	LUC 210 - Single Family Detached Housing	8	Eqn. [1]	3	7	10	Eqn. [1]	5	3	8
Country Fields Phase 2	LUC 210 - Single Family Detached Housing	25	Eqn. [1]	6	17	23	Eqn. [1]	14	8	22
Jarvis Meadows Phase 2	LUC 210 - Single Family Detached Housing	20	Eqn. [1]	5	14	19	Eqn. [1]	11	7	18
Jarvis Meadows Phase 3	LUC 210 - Single Family Detached Housing	67	Eqn. [1]	13	39	52	Eqn. [1]	36	21	57
Saunders Drive	LUC 221 - Multifamily Housing (Mid-Rise)	24	Eqn. [3]	6	16	22	Eqn. [3]	13	8	21
		Total Trip Generation		**39**	**115**	**154**		**93**	**56**	**149**

1. LUC 210 - AM: T = 0.71(X) + 4.80 | PM: Ln(T) = 0.96Ln(X) + 0.20
2. LUC 220 - AM: Ln(T) = 0.95Ln(X) - 0.51 | PM: Ln(T) = 0.89Ln(X) - 0.02
3. LUC 221 - AM: Ln(T) = 0.98Ln(X) - 0.98 | PM: Ln(T) = 0.96Ln(X) - 0.63

The development trips were assigned to the study area road network based on the existing travel patterns identified in the existing traffic counts, and the most logical routes to and from the respective land parcels. **Table 2** summarizes the trip distribution applied in this study. **Figure 4** and **Figure 5** (attached) illustrate the site-generated traffic assignments for the AM and PM peak hours.

TABLE 2: TRIP DISTRIBUTION ESTIMATES

Origin/Destination	AM		PM	
	IN	OUT	IN	OUT
North via Ontario Highway 6	35%	43%	46%	32%
South via Ontario Highway 6	25%	13%	15%	26%
East via Talbot Street	17%	13%	13%	17%
West via Talbot Street	23%	31%	26%	25%
Total	**100%**	**100%**	**100%**	**100%**

Future (2038) Total Traffic Conditions

The future (2038) total traffic volumes include the addition of the development traffic volumes (**Figure 4** and **Figure 5**) and the background traffic forecasts (**Figure 1** and **Figure 2**). **Figure 6** and **Figure 7** illustrate the 2038 total traffic volumes.

Future Traffic Operations

The future total traffic volumes have been analyzed at the 2038 horizon year to determine the level of service conditions. The analysis assumed the existing traffic controls, and signal timings at the signalized intersections were not adjusted to determine if the future total traffic can be accommodated by the existing geometric and operational infrastructure.

Table 3 details the level of service conditions and indicates the study area intersections are forecast to generally operate at acceptable levels of service and within capacity, similar to the existing (2018) traffic conditions. The following changes are noted:

- The intersection of Talbot Street and Main Street is currently operating at LOS B or better and is forecast to operate at LOS C or better under 2038 conditions; and
- The eastbound approach on Nanticoke Creek Parkway is currently operating at LOS C (v/c ratio of 0.32) and is forecast to degrade to LOS E (v/c ratio of 0.56) under 2038 conditions.

Appendix A contains the detailed Synchro reports.

Potential Remedial Measures

The intersection analyses conducted in this memorandum does not identify any critical movements at the 2038 horizon; however, remedial measures that could be implemented to improve traffic operations include the following:

- Installation of eastbound and westbound left-turn lanes on Nanticoke Creek Parkway at Highway 6. The installation of these lanes can be accommodated within the existing right-of-way through pavement marking modifications;
- Monitoring the intersection of Nanticoke Creek Parkway and Highway 6 for the installation of traffic signals, even though 2038 volumes do not appear to warrant traffic signals at the intersection;
- Monitoring the intersection of Main Street and Talbot Street to ensure a reasonable level of service is maintained; and
- Installing left-turn lanes on all approaches at the intersection of Main Street and Talbot Street. This would serve to separate left-turning traffic from through and right-turning traffic and reduce the potential for turning movement collisions.

TABLE 3: 2038 FUTURE TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Highway 6 & Natnticoke Creek Parkway	TWSC	LOS	<	C	>	**C**	<	C	>	**C**	A	A	A	**A**	A	A	A	**A**	
			Delay	<	19	>	**19**	<	19	>	**19**	8	0	0	**1**	0	0	0	**0**	
			V/C	<	0.31	>		<	0.09	>		0.03	0.25	0.01		0.00	0.16	0.05		
			Q	<	11	>		<	3	>		1	0	0		0	0	0		
			Ex	<	-	>		<	-	>		120	-	120		90	-	90		
			Avail.	<	-	>		<	-	>		119	-	120		90	-	120		
	2 - Talbot Street & Main Street	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	14	>	**14**	<	15	>	**15**	<	13	>	**13**	<	14	>	**14**	**14**
			V/C	<	0.41	>		<	0.46	>		<	0.35	>		<	0.39	>		**0.42**
			Q	<	32	>		<	40	>		<	31	>		<	30	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	3 - Talbot Street & Craddock Boulevard	TWSC	LOS	<	A		**A**		A	>	**A**					<	B	>	**B**	
			Delay	<	1		**1**		0	>	**0**					<	11	>	**11**	
			V/C	<	0.02				0.14	>						<	0.12	>		
			Q	<	1				0	>						<	3	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	4 - Talbot Street & Saunders Drive	TWSC	LOS	<	A		**A**		A	>	**A**					<	A	>	**C**	
			Delay	<	0		**0**		0	>	**0**					<	2	>	**15**	
			V/C	<	0.00				0.00	>						<	0.00	>		
			Q	<	0				0	>						<	0	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	5 - Talbot Street & Haldimand Road 55	TCS	LOS	B	B	B	**B**	B	B	>	**B**	B	B	B	**B**	B	C	>	**C**	**B**
			Delay	13	14	13	**17**	13	14	>	**14**	19	20	18	**20**	18	21	>	**21**	**17**
			V/C	0.03	0.16	0.02		0.04	0.18	>		0.07	0.15	0.00		0.01	0.26	>		**0.22**
			Q	5	23	1		6	26	>		9	20	0		4	34	>		
			Ex	85	-	100		110	-	>		85	-	100		105	-	>		
			Avail.	80	-	99		104	-	>		76	-	100		102	-	>		
PM Peak Hour	1 - Highway 6 & Natnticoke Creek Parkway	TWSC	LOS	<	E	>	**E**	<	D	>	**D**	A	A	A	**A**	A	A	A	**A**	
			Delay	<	35	>	**35**	<	25	>	**25**	9	0	0	**1**	9	0	0	**0**	
			V/C	<	0.56	>		<	0.12	>		0.05	0.21	0.01		0.01	0.31	0.05		
			Q	<	25	>		<	3	>		1	0	0		0	0	0		
			Ex	<	-	>		<	-	>		120	-	120		90	-	90		
			Avail.	<	-	>		<	-	>		119	-	120		90	-	120		
	2 - Talbot Street & Main Street	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	C	>	**C**	**C**
			Delay	<	20	>	**20**	<	14	>	**14**	<	12	>	**12**	<	32	>	**32**	**23**
			V/C	<	0.65	>		<	0.42	>		<	0.29	>		<	0.88	>		**0.76**
			Q	<	57	>		<	34	>		<	25	>		<	#110.5	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	3 - Talbot Street & Craddock Boulevard	TWSC	LOS	<	A		**A**		A	>	**A**					<	B	>	**B**	
			Delay	<	2		**2**		0	>	**0**					<	11	>	**11**	
			V/C	<	0.06				0.16	>						<	0.08	>		
			Q	<	1				0	>						<	2	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	4 - Talbot Street & Saunders Drive	TWSC	LOS	<	A		**A**		A	>	**A**					<	B	>	**B**	
			Delay	<	2		**2**		0	>	**0**					<	10	>	**10**	
			V/C	<	0.03				0.14	>						<	0.05	>		
			Q	<	1				0	>						<	1	>		
			Ex	<	-				-	>						<	-	>		
			Avail.	<	-				-	>						<	-	>		
	5 - Talbot Street & Haldimand Road 55	TCS	LOS	B	B	B	**B**	B	B	>	**B**	B	C	B	**B**	B	B	>	**B**	**B**
			Delay	13	15	13	**14**	13	14	>	**14**	19	20	18	**20**	19	19	>	**19**	**17**
			V/C	0.02	0.24	0.01		0.00	0.21	>		0.09	0.20	0.01		0.06	0.10	>		**0.22**
			Q	4	34	1		1	31	>		12	28	0		9	14	>		
			Ex	85	-	100		110	-	>		85	-	100		105	-	>		
			Avail.	81	-	100		109	-	>		73	-	100		97	-	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

<- Shared Left/Through Lane
>- Shared Right/Through Lane

2010 Jarvis MSP Recommendations

It is noted the 2010 MSP identified the following infrastructure improvements over a 20-year timeframe:

- Monitoring and implementing mitigative measures (e.g., parking restrictions, revised lane designations) to improve LOS and safety at the Main Street and Talbot Street intersection;
- Need for a new collector road connecting to Highway 3 to accommodate developments in southwest Jarvis;
- Addition of sidewalks on one or both sides of Highway 3 from Highway 6 to the easterly Town limits; and
- Potential re-striping of Main Street (Highway 6) and Talbot Street (Highway 3) to accommodate bicycle lanes.

The remedial measures identified in this Memorandum can be implemented along with the 2010 recommendations involving mitigative measures at the Main Street and Talbot Street intersection, as well as the addition of sidewalks and bicycle lanes on Main Street and Talbot Street.

Also, the need for a new collector road connecting to Highway 3 (Talbot Street) as identified in the 2010 MSP will depend on the development of the vacant lands in the southeast quadrant of Highway 3 and Highway 6.

This memorandum provides an assessment of the transportation impacts of the proposed land use projections at the 2038 horizon year and identifies potential remedial measures to address those impacts. It also provides the context and continuity from 2010 Jarvis MSP recommendations. We look forward to receiving feedback from the Project Team on the findings and conclusions of this Memorandum in preparing the Final Report and Recommendations.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

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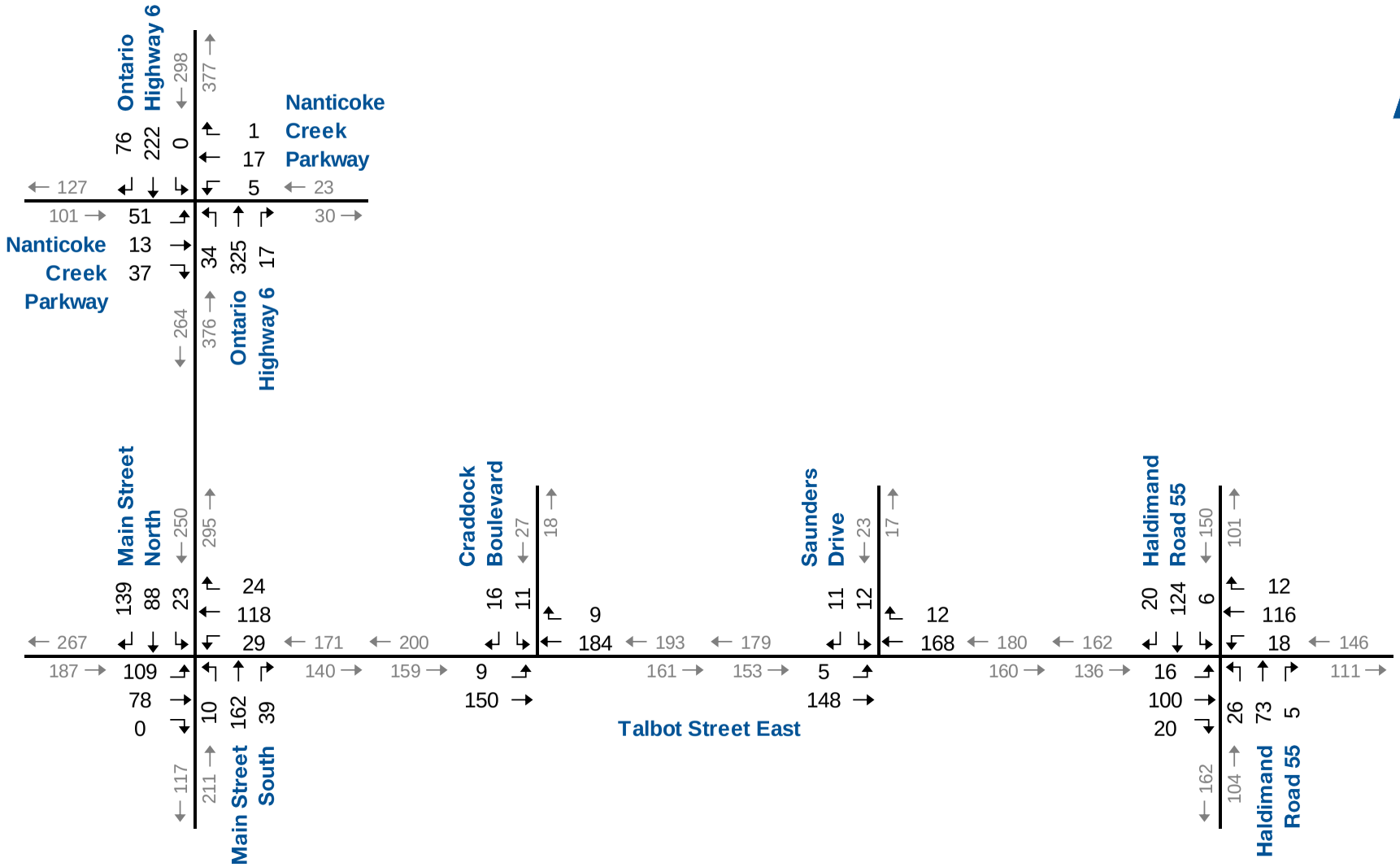
Attachments



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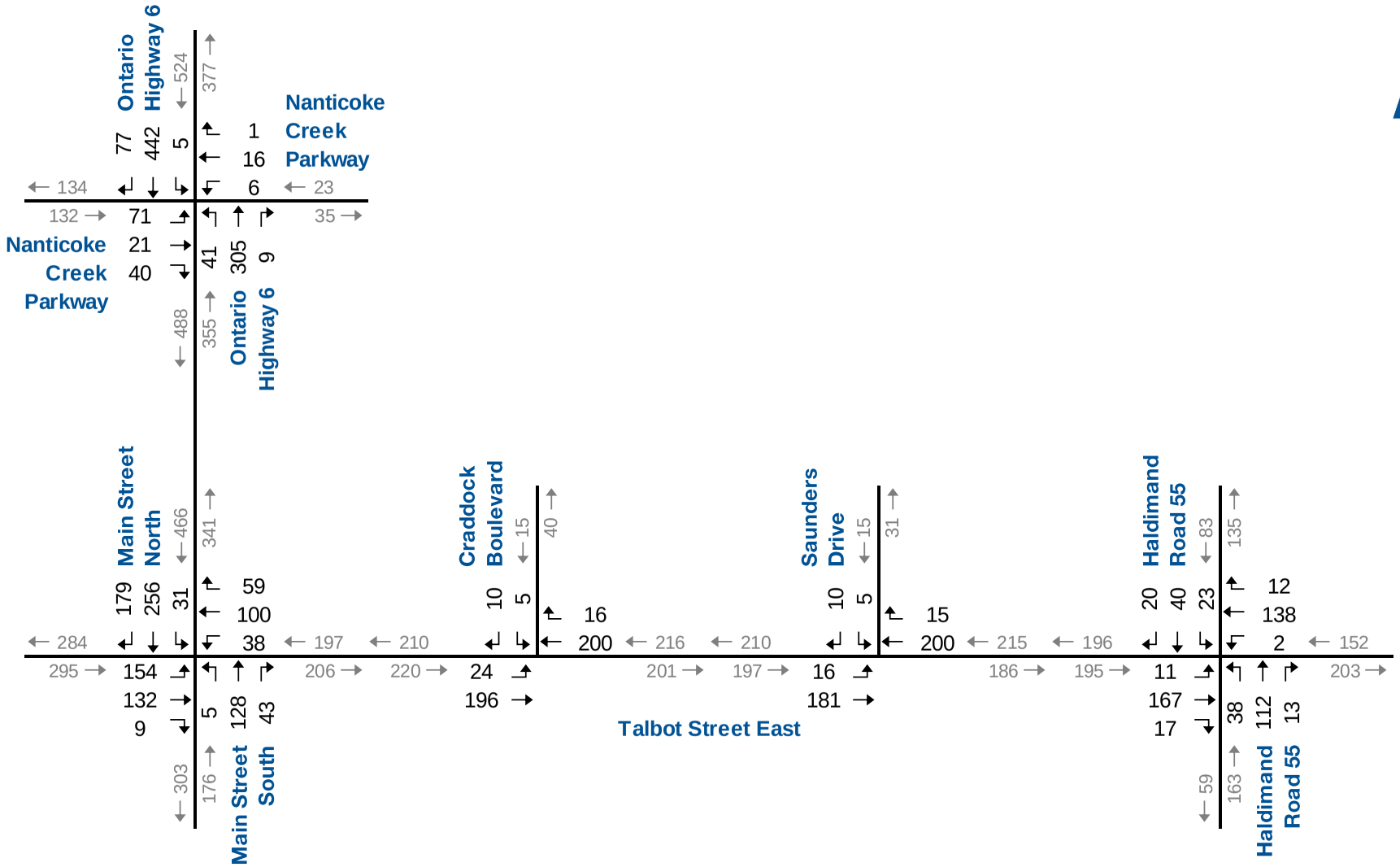
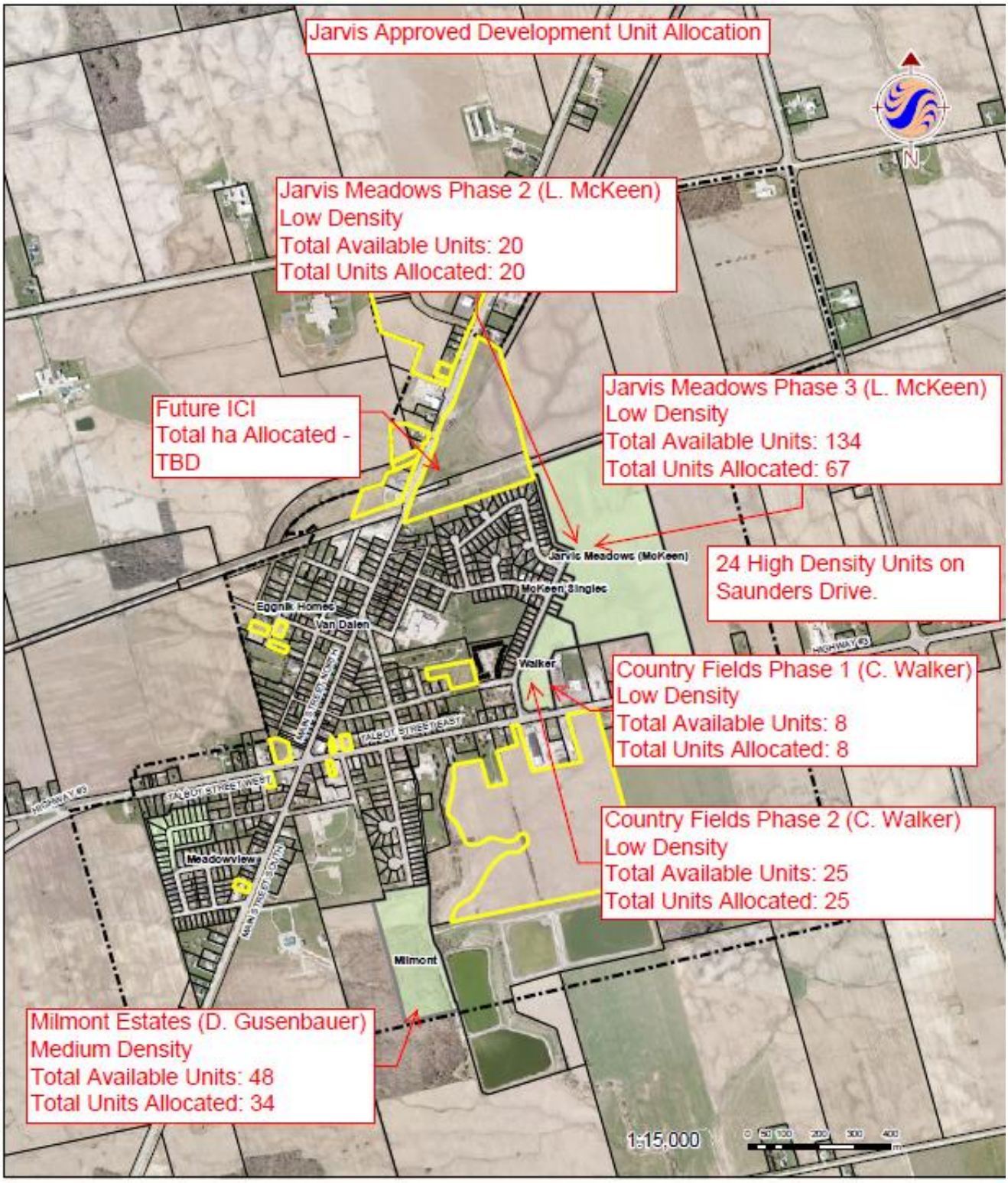
2038 Future Background Traffic Forecast AM Peak Hour

Figure 1



2038 Future Background Traffic Forecast PM Peak Hour

Figure 2



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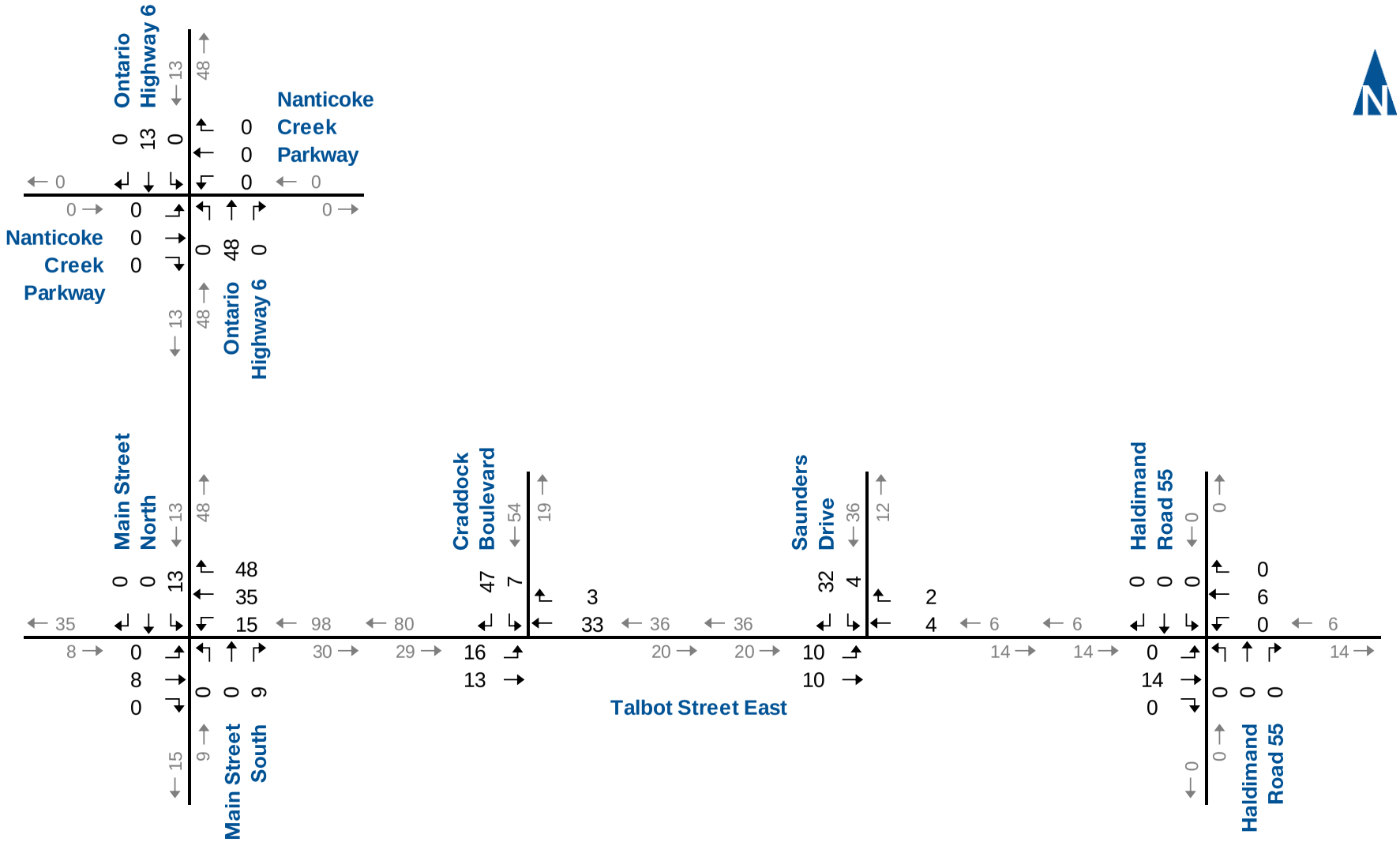
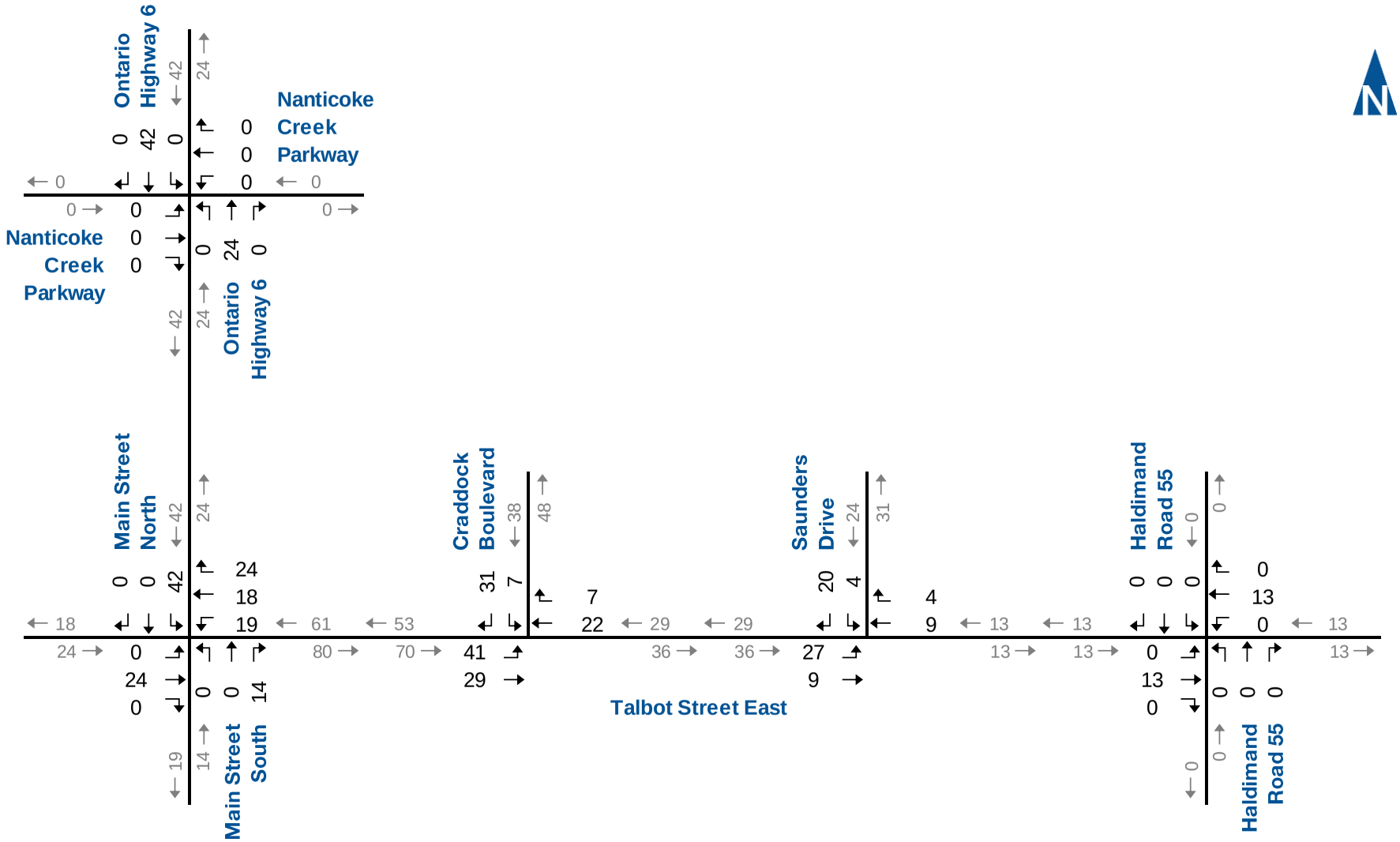
Approved Development Unit Allocations

Figure 3



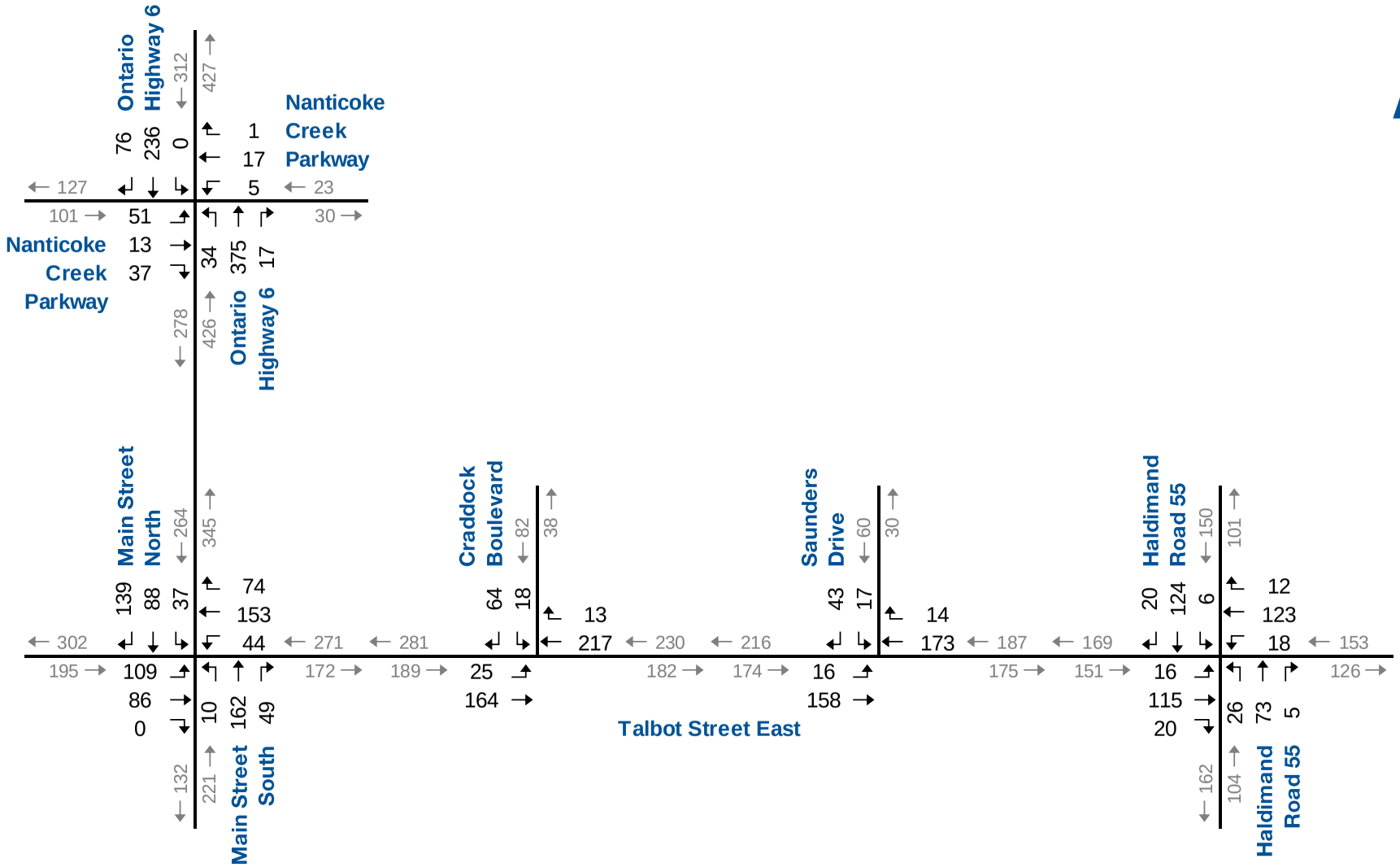
Site Generated Traffic Forecast AM Peak Hour

Figure 4



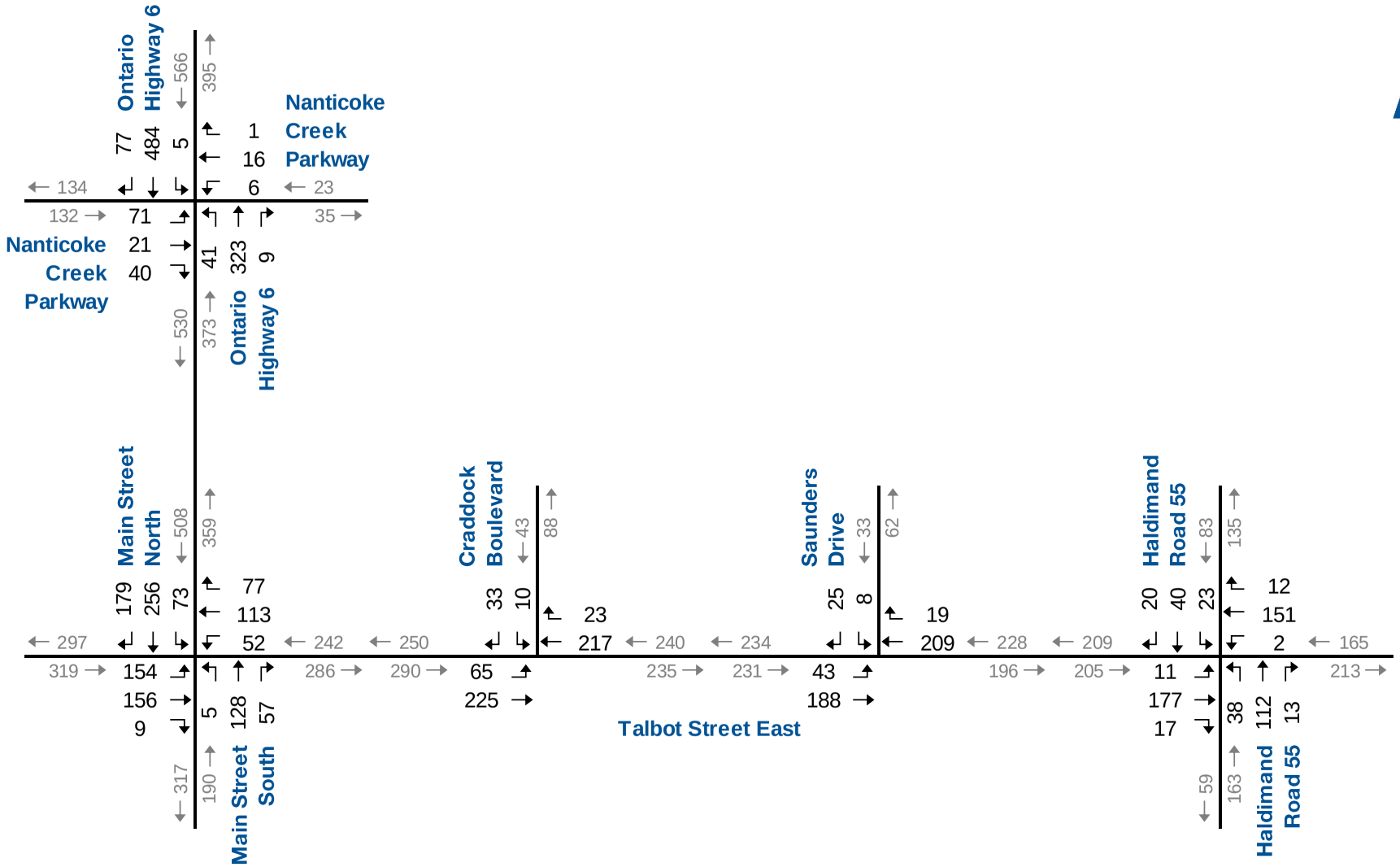
Site Generated Traffic Forecast
PM Peak Hour

Figure 5



2038 Future Total Traffic Forecast AM Peak Hour

Figure 6



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2038 Future Total Traffic Forecast PM Peak Hour

Figure 7

Appendix A

Future Total Traffic Operations Summary Reports

Lanes, Volumes, Timings
1: Highway 6 & Nanticoke Creek Parkway

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	13	37	5	17	1	34	375	17	0	236	76
Future Volume (vph)	51	13	37	5	17	1	34	375	17	0	236	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	120.0		120.0	90.0		90.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.951			0.995				0.850			0.850
Flt Protected		0.975			0.989		0.950					
Satd. Flow (prot)	0	1629	0	0	1696	0	1626	1845	1509	1900	1810	1524
Flt Permitted		0.975			0.989		0.950					
Satd. Flow (perm)	0	1629	0	0	1696	0	1626	1845	1509	1900	1810	1524
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		334.7			473.5			426.8			479.3	
Travel Time (s)		15.1			21.3			25.6			28.8	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	7%	27%	3%	0%	14%	0%	11%	3%	7%	0%	5%	6%
Adj. Flow (vph)	58	15	42	6	19	1	39	426	19	0	268	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	115	0	0	26	0	39	426	19	0	268	86
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			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 44.9%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
1: Highway 6 & Nanticoke Creek Parkway

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	13	37	5	17	1	34	375	17	0	236	76
Future Volume (Veh/h)	51	13	37	5	17	1	34	375	17	0	236	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	58	15	42	6	19	1	39	426	19	0	268	86
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	782	791	268	822	858	426	354			445		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	782	791	268	822	858	426	354			445		
tC, single (s)	7.2	6.8	6.2	7.1	6.6	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.3	3.5	4.1	3.3	2.3			2.2		
p0 queue free %	79	95	95	98	93	100	97			100		
cM capacity (veh/h)	281	285	768	261	272	633	1156			1126		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	115	26	39	426	19	0	268	86
Volume Left	58	6	39	0	0	0	0	0
Volume Right	42	1	0	0	19	0	0	86
cSH	367	276	1156	1700	1700	1700	1700	1700
Volume to Capacity	0.31	0.09	0.03	0.25	0.01	0.00	0.16	0.05
Queue Length 95th (m)	10.5	2.5	0.8	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	19.2	19.4	8.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	A					
Approach Delay (s)	19.2	19.4	0.7			0.0		
Approach LOS	C	C						

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	44.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Lanes, Volumes, Timings
2: Main Street & Talbot Street East

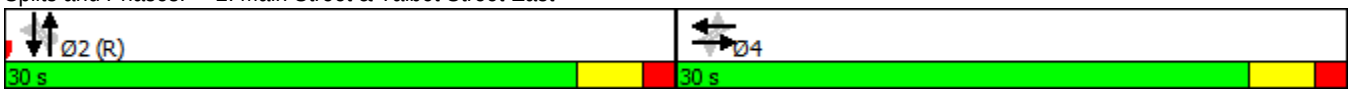
2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	86	0	44	153	74	10	162	49	37	88	139
Future Volume (vph)	109	86	0	44	153	74	10	162	49	37	88	139
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								1.00			0.99	
Frt					0.963			0.970			0.929	
Flt Protected		0.973			0.992			0.998			0.993	
Satd. Flow (prot)	0	1708	0	0	1542	0	0	1590	0	0	1489	0
Flt Permitted		0.715			0.925			0.984			0.933	
Satd. Flow (perm)	0	1255	0	0	1437	0	0	1568	0	0	1399	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					39			30			115	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		190.6			627.7			265.6			263.4	
Travel Time (s)		13.7			45.2			19.1			19.0	
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	6%	11%	0%	4%	7%	5%	0%	4%	3%	5%	4%	5%
Parking (#/hr)					0			0			0	
Adj. Flow (vph)	122	97	0	49	172	83	11	182	55	42	99	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	219	0	0	304	0	0	248	0	0	297	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	1.14	1.00	1.00	1.14	1.00	1.00	1.14	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.5	30.5		30.5	30.5		30.5	30.5		30.5	30.5	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.41			0.48			0.36			0.45	
Control Delay		15.0			13.9			12.1			9.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.0			13.9			12.1			9.9	
LOS		B			B			B			A	
Approach Delay		15.0			13.9			12.1			9.9	
Approach LOS		B			B			B			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 64.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Main Street & Talbot Street East



Queues
2: Main Street & Talbot Street East

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	219	304	248	297
v/c Ratio	0.41	0.48	0.36	0.45
Control Delay	15.0	13.9	12.1	9.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.0	13.9	12.1	9.9
Queue Length 50th (m)	16.8	20.6	16.0	13.2
Queue Length 95th (m)	32.4	39.6	31.0	30.3
Internal Link Dist (m)	166.6	603.7	241.6	239.4
Turn Bay Length (m)				
Base Capacity (vph)	533	633	683	660
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.48	0.36	0.45

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Main Street & Talbot Street East

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	86	0	44	153	74	10	162	49	37	88	139
Future Volume (vph)	109	86	0	44	153	74	10	162	49	37	88	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.97			0.93	
Flt Protected		0.97			0.99			1.00			0.99	
Satd. Flow (prot)		1708			1542			1590			1489	
Flt Permitted		0.71			0.93			0.98			0.93	
Satd. Flow (perm)		1255			1438			1568			1399	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	122	97	0	49	172	83	11	182	55	42	99	156
RTOR Reduction (vph)	0	0	0	0	22	0	0	17	0	0	66	0
Lane Group Flow (vph)	0	219	0	0	282	0	0	231	0	0	231	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	6%	11%	0%	4%	7%	5%	0%	4%	3%	5%	4%	5%
Parking (#/hr)					0			0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		25.5			25.5			25.5			25.5	
Effective Green, g (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Lane Grp Cap (vph)		533			611			666			594	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.20			0.15			c0.17	
v/c Ratio		0.41			0.46			0.35			0.39	
Uniform Delay, d1		12.0			12.3			11.6			11.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.3			2.5			1.4			1.9	
Delay (s)		14.4			14.8			13.1			13.8	
Level of Service		B			B			B			B	
Approach Delay (s)		14.4			14.8			13.1			13.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Talbot Street East & Craddock Blvd

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	25	164	217	13	18	64
Future Volume (vph)	25	164	217	13	18	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.992		0.895	
Flt Protected		0.993			0.989	
Satd. Flow (prot)	0	1722	1710	0	1514	0
Flt Permitted		0.993			0.989	
Satd. Flow (perm)	0	1722	1710	0	1514	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		627.7	323.8		121.4	
Travel Time (s)		45.2	23.3		8.7	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	11%	10%	14%	22%	8%
Adj. Flow (vph)	26	171	226	14	19	67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	197	240	0	86	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 37.4%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
3: Talbot Street East & Craddock Blvd

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	164	217	13	18	64
Future Volume (Veh/h)	25	164	217	13	18	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	26	171	226	14	19	67
Pedestrians					5	
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	245				461	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	245				461	238
tC, single (s)	4.1				6.6	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.4
p0 queue free %	98				96	91
cM capacity (veh/h)	1327				511	783

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	197	240	86
Volume Left	26	0	19
Volume Right	0	14	67
cSH	1327	1700	701
Volume to Capacity	0.02	0.14	0.12
Queue Length 95th (m)	0.5	0.0	3.3
Control Delay (s)	1.2	0.0	10.9
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	10.9
Approach LOS			B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Talbot Street East & Saunders Blvd

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	158	173	14	17	43
Future Volume (vph)	16	158	173	14	17	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990		0.902	
Flt Protected		0.996			0.986	
Satd. Flow (prot)	0	1706	1696	0	1640	0
Flt Permitted		0.996			0.986	
Satd. Flow (perm)	0	1706	1696	0	1640	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		323.8	805.7		146.6	
Travel Time (s)		23.3	58.0		10.6	
Confl. Peds. (#/hr)	3			3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	12%	11%	10%	11%	0%
Adj. Flow (vph)	17	172	188	15	18	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	189	203	0	65	0
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 31.9%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
4: Talbot Street East & Saunders Blvd

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	158	173	14	17	43
Future Volume (Veh/h)	16	158	173	14	17	43
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	172	188	15	18	47
Pedestrians					3	
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	206				404	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	206				404	198
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	99				97	94
cM capacity (veh/h)	1374				577	846

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	189	203	65
Volume Left	17	0	18
Volume Right	0	15	47
cSH	1374	1700	749
Volume to Capacity	0.01	0.12	0.09
Queue Length 95th (m)	0.3	0.0	2.3
Control Delay (s)	0.8	0.0	10.3
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	115	20	18	123	12	26	73	5	6	124	20
Future Volume (vph)	16	115	20	18	123	12	26	73	5	6	124	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		100.0	110.0		0.0	85.0		100.0	105.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.850		0.986				0.850		0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1727	1233	1504	1776	0	1641	1545	1615	1805	1660	0
Flt Permitted	0.659			0.673			0.652			0.702		
Satd. Flow (perm)	1252	1727	1233	1066	1776	0	1126	1545	1615	1334	1660	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51		8				52		10	
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		805.7			412.7			457.4			469.5	
Travel Time (s)		36.3			18.6			20.6			21.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	10%	31%	20%	6%	0%	10%	23%	0%	0%	14%	0%
Adj. Flow (vph)	18	132	23	21	141	14	30	84	6	7	143	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	132	23	21	155	0	30	84	6	7	166	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
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Minimum Split (s)	27.3	27.3	27.3	27.3	27.3		25.2	25.2	25.2	25.2	25.2	
Total Split (s)	50.0	50.0	50.0	50.0	50.0		40.0	40.0	40.0	40.0	40.0	
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%		44.4%	44.4%	44.4%	44.4%	44.4%	
Maximum Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9		5.9	5.9	5.9	5.9	5.9	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.3	1.3	1.3	1.3	1.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.03	0.16	0.04	0.04	0.18		0.07	0.15	0.01	0.01	0.27	
Control Delay	12.9	14.1	1.1	13.1	13.6		19.4	20.2	0.0	18.5	20.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

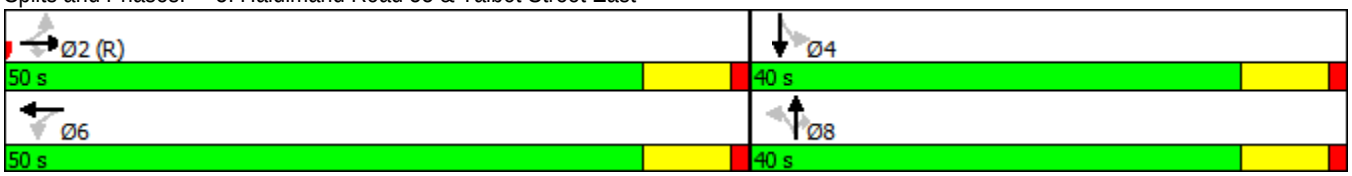
Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.9	14.1	1.1	13.1	13.6		19.4	20.2	0.0	18.5	20.4	
LOS	B	B	A	B	B		B	C	A	B	C	
Approach Delay		12.3			13.5			19.0			20.3	
Approach LOS		B			B			B			C	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.27	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Haldimand Road 55 & Talbot Street East



Queues
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	132	23	21	155	30	84	6	7	166
v/c Ratio	0.03	0.16	0.04	0.04	0.18	0.07	0.15	0.01	0.01	0.27
Control Delay	12.9	14.1	1.1	13.1	13.6	19.4	20.2	0.0	18.5	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	14.1	1.1	13.1	13.6	19.4	20.2	0.0	18.5	20.4
Queue Length 50th (m)	1.7	13.1	0.0	2.0	14.7	3.5	10.1	0.0	0.8	19.6
Queue Length 95th (m)	5.2	23.0	1.2	5.8	25.5	9.3	19.8	0.0	3.5	33.8
Internal Link Dist (m)		781.7			388.7		433.4			445.5
Turn Bay Length (m)	85.0		100.0	110.0		85.0		100.0	105.0	
Base Capacity (vph)	594	819	611	505	846	410	563	621	486	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.16	0.04	0.04	0.18	0.07	0.15	0.01	0.01	0.27

Intersection Summary

HCM Signalized Intersection Capacity Analysis
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: AM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	115	20	18	123	12	26	73	5	6	124	20
Future Volume (vph)	16	115	20	18	123	12	26	73	5	6	124	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1727	1233	1504	1777		1641	1545	1615	1805	1660	
Flt Permitted	0.66	1.00	1.00	0.67	1.00		0.65	1.00	1.00	0.70	1.00	
Satd. Flow (perm)	1251	1727	1233	1065	1777		1126	1545	1615	1335	1660	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	18	132	23	21	141	14	30	84	6	7	143	23
RTOR Reduction (vph)	0	0	12	0	4	0	0	0	4	0	6	0
Lane Group Flow (vph)	18	132	11	21	151	0	30	84	2	7	160	0
Heavy Vehicles (%)	0%	10%	31%	20%	6%	0%	10%	23%	0%	0%	14%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Effective Green, g (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Grp Cap (vph)	593	819	584	505	843		410	563	588	486	604	
v/s Ratio Prot		0.08			c0.08			0.05			c0.10	
v/s Ratio Perm	0.01		0.01	0.02			0.03		0.00	0.01		
v/c Ratio	0.03	0.16	0.02	0.04	0.18		0.07	0.15	0.00	0.01	0.26	
Uniform Delay, d1	12.6	13.5	12.5	12.7	13.6		18.7	19.2	18.2	18.3	20.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.4	0.1	0.2	0.5		0.3	0.6	0.0	0.1	1.1	
Delay (s)	12.7	13.9	12.6	12.8	14.0		19.0	19.8	18.2	18.3	21.2	
Level of Service	B	B	B	B	B		B	B	B	B	C	
Approach Delay (s)		13.6			13.9			19.5			21.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
1: Highway 6 & Nanticoke Creek Parkway

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	21	40	6	16	1	41	323	9	5	484	77
Future Volume (vph)	71	21	40	6	16	1	41	323	9	5	484	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	120.0		120.0	90.0		90.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.995				0.850			0.850
Flt Protected		0.974			0.986		0.950			0.950		
Satd. Flow (prot)	0	1724	0	0	1792	0	1752	1810	1417	1031	1863	1615
Flt Permitted		0.974			0.986		0.950			0.950		
Satd. Flow (perm)	0	1724	0	0	1792	0	1752	1810	1417	1031	1863	1615
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		334.7			473.5			426.8			479.3	
Travel Time (s)		15.1			21.3			25.6			28.8	
Confl. Peds. (#/hr)			3	3					3	3		
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 (%)	2%	6%	3%	0%	0%	100%	3%	5%	14%	75%	2%	0%
Adj. Flow (vph)	77	23	43	7	17	1	45	351	10	5	526	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	143	0	0	25	0	45	351	10	5	526	84
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			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 53.1% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
1: Highway 6 & Nanticoke Creek Parkway

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	21	40	6	16	1	41	323	9	5	484	77
Future Volume (Veh/h)	71	21	40	6	16	1	41	323	9	5	484	77
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)	77	23	43	7	17	1	45	351	10	5	526	84
Pedestrians					3			3				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	986	990	529	1038	1064	354	610			364		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	986	990	529	1038	1064	354	610			364		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	7.2	4.1			4.8		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	4.2	2.2			2.9		
p0 queue free %	62	90	92	96	92	100	95			99		
cM capacity (veh/h)	204	229	546	171	212	514	964			881		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	143	25	45	351	10	5	526	84
Volume Left	77	7	45	0	0	5	0	0
Volume Right	43	1	0	0	10	0	0	84
cSH	257	204	964	1700	1700	881	1700	1700
Volume to Capacity	0.56	0.12	0.05	0.21	0.01	0.01	0.31	0.05
Queue Length 95th (m)	24.8	3.3	1.2	0.0	0.0	0.1	0.0	0.0
Control Delay (s)	35.3	25.1	8.9	0.0	0.0	9.1	0.0	0.0
Lane LOS	E	D	A			A		
Approach Delay (s)	35.3	25.1	1.0			0.1		
Approach LOS	E	D						

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
2: Main Street & Talbot Street East

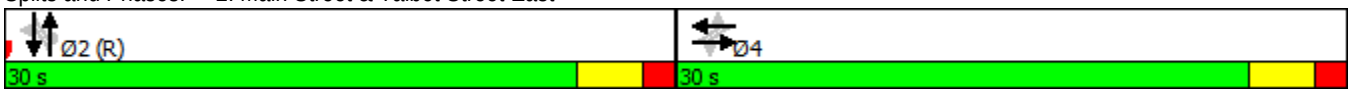
2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	156	9	52	113	77	5	128	57	73	256	179
Future Volume (vph)	154	156	9	52	113	77	5	128	57	73	256	179
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		1.00			0.99			0.99			0.99	
Frt		0.996			0.957			0.960			0.952	
Flt Protected		0.976			0.989			0.999			0.993	
Satd. Flow (prot)	0	1753	0	0	1557	0	0	1567	0	0	1554	0
Flt Permitted		0.720			0.869			0.986			0.922	
Satd. Flow (perm)	0	1291	0	0	1368	0	0	1547	0	0	1442	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			49			45			57	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		190.6			627.7			265.6			263.4	
Travel Time (s)		13.7			45.2			19.1			19.0	
Confl. Peds. (#/hr)	4					4	6		5	5		6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	8%	0%	0%	4%	4%	0%	3%	6%	8%	3%	1%
Parking (#/hr)					0			0			0	
Adj. Flow (vph)	173	175	10	58	127	87	6	144	64	82	288	201
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	358	0	0	272	0	0	214	0	0	571	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	1.14	1.00	1.00	1.14	1.00	1.00	1.14	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.5	30.5		30.5	30.5		30.5	30.5		30.5	30.5	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.65			0.45			0.31			0.89	
Control Delay		20.4			12.8			10.5			33.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		20.4			12.8			10.5			33.5	
LOS		C			B			B			C	
Approach Delay		20.4			12.8			10.5			33.5	
Approach LOS		C			B			B			C	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 95.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Main Street & Talbot Street East



Queues
2: Main Street & Talbot Street East

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	358	272	214	571
v/c Ratio	0.65	0.45	0.31	0.89
Control Delay	20.4	12.8	10.5	33.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.4	12.8	10.5	33.5
Queue Length 50th (m)	31.1	16.9	12.0	52.7
Queue Length 95th (m)	57.2	34.1	24.9	#110.5
Internal Link Dist (m)	166.6	603.7	241.6	239.4
Turn Bay Length (m)				
Base Capacity (vph)	550	609	683	645
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.45	0.31	0.89

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Main Street & Talbot Street East

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	156	9	52	113	77	5	128	57	73	256	179
Future Volume (vph)	154	156	9	52	113	77	5	128	57	73	256	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.96			0.96			0.95	
Flt Protected		0.98			0.99			1.00			0.99	
Satd. Flow (prot)		1752			1557			1566			1554	
Flt Permitted		0.72			0.87			0.99			0.92	
Satd. Flow (perm)		1292			1368			1546			1444	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	173	175	10	58	127	87	6	144	64	82	288	201
RTOR Reduction (vph)	0	2	0	0	28	0	0	26	0	0	33	0
Lane Group Flow (vph)	0	356	0	0	244	0	0	188	0	0	538	0
Confl. Peds. (#/hr)	4					4	6		5	5		6
Heavy Vehicles (%)	3%	8%	0%	0%	4%	4%	0%	3%	6%	8%	3%	1%
Parking (#/hr)					0			0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		25.5			25.5			25.5			25.5	
Effective Green, g (s)		25.5			25.5			25.5			25.5	
Actuated g/C Ratio		0.42			0.42			0.42			0.42	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Lane Grp Cap (vph)		549			581			657			613	
v/s Ratio Prot												
v/s Ratio Perm		c0.28			0.18			0.12			c0.37	
v/c Ratio		0.65			0.42			0.29			0.88	
Uniform Delay, d1		13.7			12.1			11.3			15.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		5.8			2.2			1.1			16.3	
Delay (s)		19.5			14.3			12.4			32.1	
Level of Service		B			B			B			C	
Approach Delay (s)		19.5			14.3			12.4			32.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	225	217	23	10	33
Future Volume (vph)	65	225	217	23	10	33
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			0.987		0.895	
Flt Protected		0.989			0.989	
Satd. Flow (prot)	0	1796	1826	0	1592	0
Flt Permitted		0.989			0.989	
Satd. Flow (perm)	0	1796	1826	0	1592	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		627.7	323.8		121.4	
Travel Time (s)		45.2	23.3		8.7	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	3%	0%	25%	0%
Adj. Flow (vph)	74	256	247	26	11	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	330	273	0	49	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
3: Talbot Street East & Craddock Blvd

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	225	217	23	10	33
Future Volume (Veh/h)	65	225	217	23	10	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	74	256	247	26	11	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	273				664	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	273				664	260
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	94				97	95
cM capacity (veh/h)	1302				370	784

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	330	273	49
Volume Left	74	0	11
Volume Right	0	26	38
cSH	1302	1700	626
Volume to Capacity	0.06	0.16	0.08
Queue Length 95th (m)	1.4	0.0	2.0
Control Delay (s)	2.2	0.0	11.2
Lane LOS	A		B
Approach Delay (s)	2.2	0.0	11.2
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	188	209	19	8	25
Future Volume (vph)	43	188	209	19	8	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989		0.899	
Flt Protected		0.991			0.988	
Satd. Flow (prot)	0	1795	1829	0	1688	0
Flt Permitted		0.991			0.988	
Satd. Flow (perm)	0	1795	1829	0	1688	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		323.8	805.7		146.6	
Travel Time (s)		23.3	58.0		10.6	
Confl. Peds. (#/hr)	1			1	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	6%	3%	0%	0%	0%
Adj. Flow (vph)	46	200	222	20	9	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	246	242	0	36	0
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 37.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Talbot Street East & Saunders Blvd

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	188	209	19	8	25
Future Volume (Veh/h)	43	188	209	19	8	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	46	200	222	20	9	27
Pedestrians			1		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	243				526	233
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	243				526	233
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				98	97
cM capacity (veh/h)	1334				497	810

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	246	242	36
Volume Left	46	0	9
Volume Right	0	20	27
cSH	1334	1700	700
Volume to Capacity	0.03	0.14	0.05
Queue Length 95th (m)	0.9	0.0	1.3
Control Delay (s)	1.7	0.0	10.4
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	177	17	2	151	12	38	112	13	23	40	20
Future Volume (vph)	11	177	17	2	151	12	38	112	13	23	40	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	85.0		100.0	110.0		0.0	85.0		100.0	105.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
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			0.850		0.989				0.850		0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1792	1509	1805	1802	0	1752	1776	1042	1626	1479	0
Flt Permitted	0.640			0.632			0.713			0.676		
Satd. Flow (perm)	1216	1792	1509	1201	1802	0	1315	1776	1042	1157	1479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51		6				52		23	
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		805.7			412.7			457.4			469.5	
Travel Time (s)		36.3			18.6			20.6			21.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	7%	0%	3%	20%	3%	7%	55%	11%	30%	6%
Adj. Flow (vph)	13	201	19	2	172	14	43	127	15	26	45	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	201	19	2	186	0	43	127	15	26	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		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
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Minimum Split (s)	27.3	27.3	27.3	27.3	27.3		25.2	25.2	25.2	25.2	25.2	
Total Split (s)	50.0	50.0	50.0	50.0	50.0		40.0	40.0	40.0	40.0	40.0	
Total Split (%)	55.6%	55.6%	55.6%	55.6%	55.6%		44.4%	44.4%	44.4%	44.4%	44.4%	
Maximum Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Yellow Time (s)	5.9	5.9	5.9	5.9	5.9		5.9	5.9	5.9	5.9	5.9	
All-Red Time (s)	1.4	1.4	1.4	1.4	1.4		1.3	1.3	1.3	1.3	1.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.02	0.24	0.03	0.00	0.22		0.09	0.20	0.04	0.06	0.12	
Control Delay	12.8	14.9	0.4	12.5	14.2		19.6	20.6	0.2	19.3	14.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

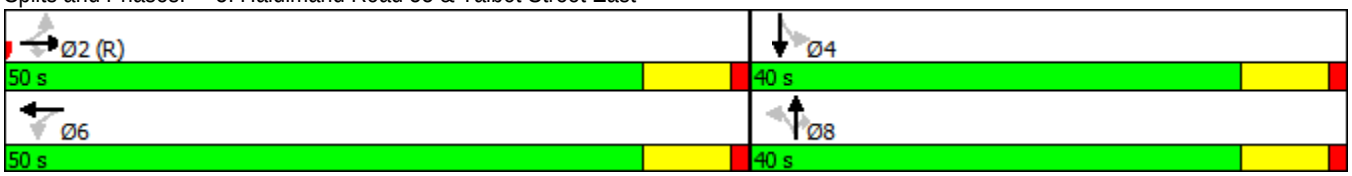
Lanes, Volumes, Timings
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.8	14.9	0.4	12.5	14.2		19.6	20.6	0.2	19.3	14.4	
LOS	B	B	A	B	B		B	C	A	B	B	
Approach Delay		13.6			14.2			18.7			15.8	
Approach LOS		B			B			B			B	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.24	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Haldimand Road 55 & Talbot Street East



Queues
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	201	19	2	186	43	127	15	26	68
v/c Ratio	0.02	0.24	0.03	0.00	0.22	0.09	0.20	0.04	0.06	0.12
Control Delay	12.8	14.9	0.4	12.5	14.2	19.6	20.6	0.2	19.3	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	14.9	0.4	12.5	14.2	19.6	20.6	0.2	19.3	14.4
Queue Length 50th (m)	1.2	20.8	0.0	0.2	18.4	5.1	15.6	0.0	3.0	5.3
Queue Length 95th (m)	4.3	34.0	0.5	1.4	30.9	12.1	27.8	0.0	8.5	13.9
Internal Link Dist (m)		781.7			388.7		433.4			445.5
Turn Bay Length (m)	85.0		100.0	110.0		85.0		100.0	105.0	
Base Capacity (vph)	576	850	742	569	858	479	647	412	421	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.24	0.03	0.00	0.22	0.09	0.20	0.04	0.06	0.12

Intersection Summary

HCM Signalized Intersection Capacity Analysis
5: Haldimand Road 55 & Talbot Street East

2038 Horizon: PM Peak Hour
180197: Jarvis Master Servicing Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	177	17	2	151	12	38	112	13	23	40	20
Future Volume (vph)	11	177	17	2	151	12	38	112	13	23	40	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1792	1509	1805	1801		1752	1776	1042	1626	1480	
Flt Permitted	0.64	1.00	1.00	0.63	1.00		0.71	1.00	1.00	0.68	1.00	
Satd. Flow (perm)	1217	1792	1509	1200	1801		1315	1776	1042	1156	1480	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	12	201	19	2	172	14	43	127	15	26	45	23
RTOR Reduction (vph)	0	0	10	0	3	0	0	0	10	0	15	0
Lane Group Flow (vph)	13	201	9	2	183	0	43	127	5	26	53	0
Heavy Vehicles (%)	0%	6%	7%	0%	3%	20%	3%	7%	55%	11%	30%	6%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Effective Green, g (s)	42.7	42.7	42.7	42.7	42.7		32.8	32.8	32.8	32.8	32.8	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.36	0.36	0.36	0.36	0.36	
Clearance Time (s)	7.3	7.3	7.3	7.3	7.3		7.2	7.2	7.2	7.2	7.2	
Lane Grp Cap (vph)	577	850	715	569	854		479	647	379	421	539	
v/s Ratio Prot		c0.11			0.10			c0.07			0.04	
v/s Ratio Perm	0.01		0.01	0.00			0.03		0.01	0.02		
v/c Ratio	0.02	0.24	0.01	0.00	0.21		0.09	0.20	0.01	0.06	0.10	
Uniform Delay, d1	12.6	14.0	12.5	12.5	13.8		18.8	19.6	18.3	18.6	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.7	0.0	0.0	0.6		0.4	0.7	0.1	0.3	0.4	
Delay (s)	12.6	14.7	12.5	12.5	14.4		19.2	20.3	18.3	18.9	19.2	
Level of Service	B	B	B	B	B		B	C	B	B	B	
Approach Delay (s)		14.4			14.4			19.8			19.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix C

Work Package 3 & 4 – Preferred Servicing Strategies and Implementation

Issued: May 12, 2019
Revised: June 7, 2019

Prepared for:

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Work Package 3 & 4 - Preferred Servicing Strategies and Implementation Plan

Jarvis Master Servicing Plan Update

J.L.Richards
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Table of Contents

1.0 INTRODUCTION 1
1.1 Project Overview 1
1.2 Objectives of the Master Plan 1
1.3 Study Area Overview 1
1.4 Previous Studies 3
2.0 CLASS ENVIRONMENTAL ASSESSMENT 4
2.1 Class Environmental Assessment and Master Planning Process 4
2.2 Problem Statement 4
2.3 Public Consultation Plan 5
3.0 FUTURE CONDITIONS 5
4.0 WATER SERVICING ALTERNATIVES UPDATE 7
4.1 Future Servicing Requirements and Evaluation 7
4.2 Updated Preferred Alternative and Implementation 7
5.0 WASTEWATER SERVICING ALTERNATIVES UPDATE 10
5.1 Future Servicing Requirements and Evaluation 10
5.2 Updated Preferred Alternative and Implementation 10
6.0 STORMWATER SERVICING ALTERNATIVES UPDATE 15
6.1 Future Servicing Requirements and Evaluation 15
6.2 Updated Preferred Alternative and Implementation 15
7.0 TRANSPORTATION SERVICING ALTERNATIVES UPDATE 19
7.1 Future Servicing Requirements and Evaluation 19
7.2 Updated Preferred Alternative and Implementation 19
8.0 CONCLUSION 22
9.0 REFERENCES 23

List of Figures

Figure 1 Study Area Boundary and Designated Land Uses 2
Figure 2 Anticipated Development from 2018 - 2038 6
Figure 3 Proposed Future (2038) Water Distribution System Upgrades 8
Figure 4 Proposed Future (2038) Wastewater Collection System Upgrades 11
Figure 5 Proposed Future (2038) Stormwater System Upgrades..... 16
Figure 6 Proposed Future (2038) Transportation System Upgrades..... 20

List of Tables

Table 1 Cost Estimates and Timing of Preferred Water Servicing Alternative..... 9
Table 2 Cost Estimate and Timing of Preferred Wastewater Servicing Alternative 12
Table 3 Cost Estimate and Timing of Preferred Stormwater Servicing Alternative..... 17
Table 4 Cost Estimate and Timing of Preferred Transportation Alternative..... 21

List of Appendices

Appendix A – Water

Appendix B – Wastewater

Appendix C – Stormwater

Appendix D – Transportation Report

1.0 INTRODUCTION

1.1 Project Overview

The community of Jarvis is located approximately 15 kilometres north of Lake Erie in the western part of Haldimand County (the County) at the cross roads of Highway 6 and Highway 3. The community has a population of approximately 2,000 residents (Watson, 2018), and development is predominantly residential. Industrial, commercial, and institutional (ICI) development is concentrated in the north side of the community along Highway 6.

In 2010 the Jarvis Master Servicing Plan (MSP) for Water, Wastewater, Stormwater, and Transportation (Stantec, 2010) was completed. To support planned growth and intensification identified in the County's Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP). The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area, and identify updates to existing conditions and related assumptions based on growth that has since occurred.

1.2 Objectives of the Master Plan

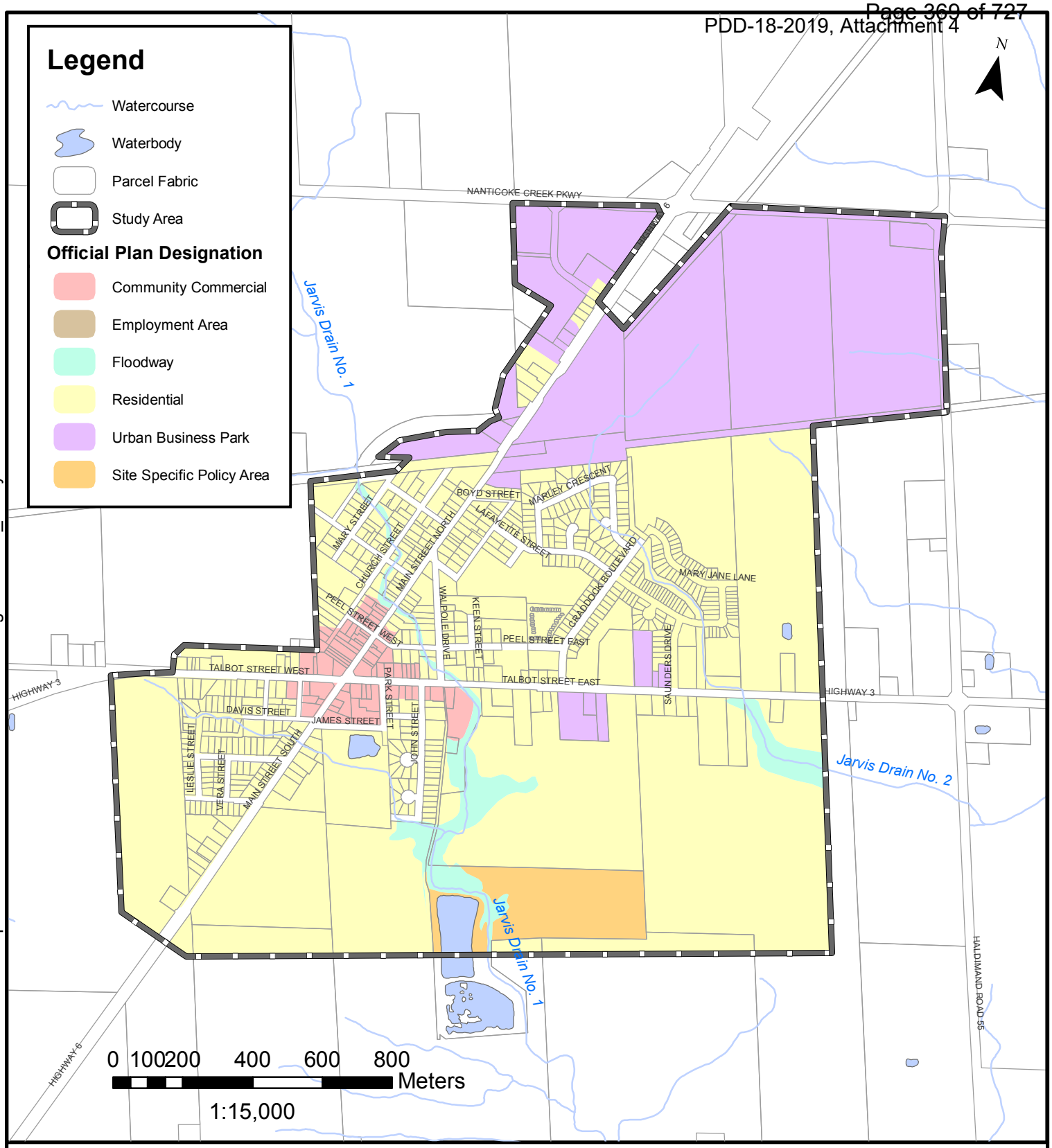
The Master Plan update will consider the findings from the 2010 MSP, as well as changes to the environment (as defined in the EA Act) and infrastructure since it was completed. Each component of the MSP update will be provided in the framework provided below:

- Work Package 1 – Background Review and Updates to Existing Conditions
- Work Package 2 – Growth Forecast and Assessment of Future Needs
- Work Package 3 – Development of Preferred Servicing Strategies
- Work Package 4 – Implementation Plan, Final Report and Presentation.

As well as updating the MSP, the County is concurrently conducting a Class EA to determine the preferred alternative to increase wastewater treatment capacity for Jarvis. The Class EA will be documented in a separate report.

1.3 Study Area Overview

The study area for the MSP update encompasses the urban boundary of Jarvis, consistent with the 2010 Jarvis MSP study area. Figure 1 illustrates the study area boundary. Municipal infrastructure in Jarvis includes a municipal water and wastewater system, stormwater infrastructure, and a transportation network.



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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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STUDY AREA BOUNDARY AND DESIGNATED LAND USES

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FIGURE 1

File Location: V:\28000\28176 Jarvis Water Model Backup\3-JLR DWG\1-Civil\GIS\Work Package 2\28176_StudyArea.mxd

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Community water is supplied via a transmission main from the Nanticoke Water Treatment Plant (WTP) and stored in a shared elevated tank north of Townsend. Wastewater in Jarvis is conveyed to the Jarvis wastewater treatment lagoons which are owned and operated by the County. The storm system in Jarvis generally consists of traditional stormwater management infrastructure (e.g. ditches, urban curb and gutter networks) and two (2) stormwater management (SWM) facilitates. The community of Jarvis is built adjacent to Highway 6 (Main Street) and Highway 3 (Talbot Street). Both those highways are “connecting links” in the Provincial highway network.

1.4 Previous Studies

In 2010, a Master Servicing Plan (MSP) was prepared (Stantec, 2010) to help guide the development of water, wastewater, storm and transportation services with respect to the County’s Official Plan to accommodate future development. Further details of the report findings are discussed in Work Package 1.

In addition to the 2010 MSP referenced throughout this report, the following studies related to water, wastewater, stormwater, and transportation infrastructure in Jarvis are referenced in the preparation of this Master Servicing Plan Update.

2010 MSP – present

Haldimand County Services and Planning Division. *Design Criteria*, Version 4.0, April 2015.

Ministry of Municipal Affairs and Housing. Ontario Government, *Provincial Policy Statement, 2014*, Section 3 Planning Act, 30 April 2014.

Haldimand County Planning & Economic Development Department. *The Haldimand County Official Plan*, Council adopted 26 June 2006, Ministry approved 8 June 2009.

Lake Erie Region Source Protection Committee. Long Point Region Source Protection Area Approved Source Protection Plan, Under Clean Water Act 2006, 4 November 2015.

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update*, 2016-2046 - Preliminary Draft Findings. October 2018.

Upper Canada Consultants. *Topographic Volumetric Survey of Jarvis Sewage Lagoons*, 17 July 2018.

Dave Chapman (CPO Inc.). *Jarvis lagoons: Capacity Assessment & Contingency and Abatement Plan Technical Memo,* 6 June 2011.

CPO Inc. and Haldimand County. *Jarvis lagoon Effluent Phosphorous Offsetting,* 20 July 2016.

Stantec Consulting Ltd. *Jarvis Master Servicing Plan Water, Wastewater, Stormwater, and Transportation*, September 2010.

Prior to 2010 MSP

Stantec Consulting Ltd. *Jarvis Inflow and Infiltration Study*, March 2010.

2.0 CLASS ENVIRONMENTAL ASSESSMENT

2.1 Class Environmental Assessment and Master Planning Process

The Ontario Environmental Assessment Act (Act) sets out a planning and decision-making process to consider potential environmental effects before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. In 1987, the first Class EA document prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011 and 2015.

This Master Servicing Plan Update is being completed with sufficient detail to fulfil the requirements for Schedule B projects (Approach #2) concurrently with a Class Environmental Assessment, for additional wastewater treatment capacity at the Jarvis Wastewater Treatment Lagoons.

Projects categorized as Schedule B or Schedule C undertakings have the potential for significant environmental impacts, and are required to follow specific phases under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project, and the preparation of a Class EA Project File or Environmental Study Report that documents the Class EA process.

For the Master Servicing Plan Update, a Project File or Environmental Study Report shall be made available for public and agency review at the completion of the Class EA process for a mandatory 30-day period. If there are no requests to the Minister of the Environment, Conservation and Parks (MECP) for a ‘Part II Order’ within the review period, then the project may proceed to implementation (Phase 5).

2.2 Problem Statement

To support planned growth and intensification identified in the County’s Official Plan, Haldimand County is undertaking an engineering study to update the 2010 Master Servicing Plan (MSP) The purpose of the Master Servicing Plan Update is to evaluate the community’s long-term infrastructure needs and identify a preferred solution to be implemented to match growth in Jarvis over the next 20 years.

The Class EA framework will enable consideration of options and identify a preferred solution that is environmentally, socially, and financially responsible and sustainable.

The study will consider the needs and viewpoints of all participating stakeholders including, but not limited to, residents, government agencies, the general population, and Indigenous communities.

2.3 Public Consultation Plan

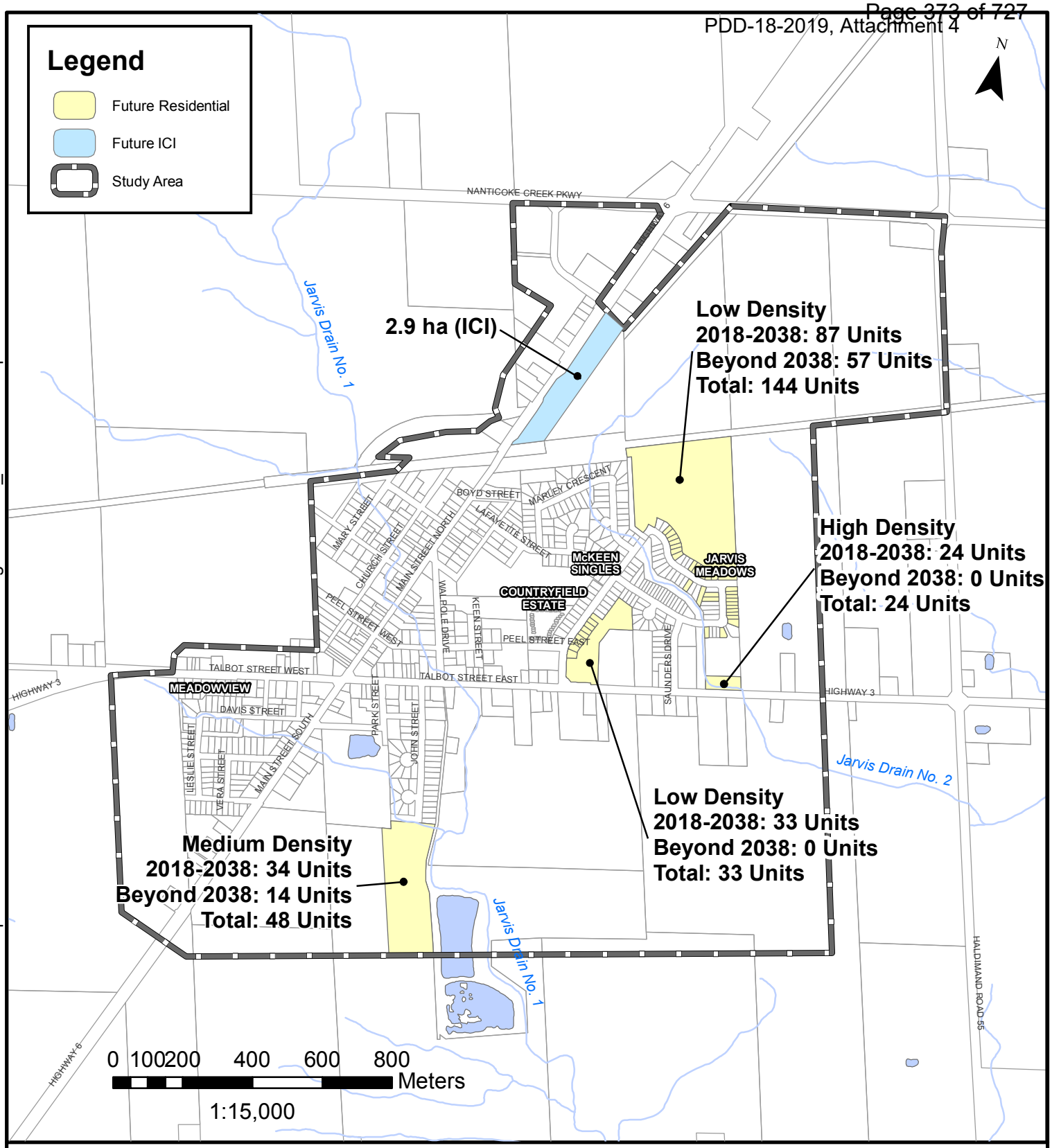
Public and agency consultation for this assignment is anticipated to consist of:

- Notice of Commencement
- Meetings with Review Agencies (as required)
- Project Committee Meetings
- Public Information Centre(s)
- Filing of the Project File/ESR and Notice of Completion

Consultation activities undertaken as part of the MSP Update will be documented in the Project File report.

3.0 FUTURE CONDITIONS

In Work Package 2 (JLR, June 7, 2019), future residential growth was distributed based on approved development in Jarvis and residential density. Anticipated growth in Jarvis is approximately 6.54 ha (120 units) of low density residential land, 1.85 ha (34 units) of medium density residential land, 0.35 ha (24 units) of high density residential land and 2.91 ha of ICI land to be developed. See Figure 2 for the distribution of future residential and ICI development from 2018-2038.



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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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ANTICIPATED DEVELOPMENT FROM 2018 TO 2038

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FIGURE 2

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4.0 WATER SERVICING ALTERNATIVES UPDATE

4.1 Future Servicing Requirements and Evaluation

4.1.1 Water Distribution System

In Work Package 2 (JLR, June 7, 2019) the water model was updated to include future population growth to 2038. The extended future water distribution system is shown in Figure 3. Watermain extensions to serve development anticipated in the 20-year planning horizon (2038) and create loops are shown in orange. In the 2010 Master Servicing Plan, consideration was given to servicing vacant lands beyond the 20-year planning horizon. Watermain extensions to serve these vacant lands are shown in grey.

To improve redundancy of supply and system looping the 2010 MSP proposed a secondary connection from the Nanticoke WTP to Jarvis. Two alternatives were reviewed. Alternative 1 included new feedermain on Highway 6 and Alternative 2 consisted of a new feedermain on Talbot Street West. It was proposed for both alternatives that the new feedermain would extend the existing 400 mm watermain on Main Street North. System pressures under peak hour demands and maximum day fire flow results were updated and reviewed for both alternatives (refer to Appendix A). As found in the 2010 MSP, both options perform similarly in terms of satisfying pressure and supply constraints.

Alternative 2 continues to be preferred, due to the lower cost of implementation. However, in 2018, the Nanticoke to Caledonia Water Supply Feasibility Study (Wood, 2018) was completed to assess the current Nanticoke and Caledonia water supply systems. As part of the study, consideration was given to the replacement of the existing watermain connecting Nanticoke Water Treatment Plant to Townsend with a new feedermain along Highway 55. Prior to implementation of a new feedermain on Talbot Street West, consideration should be given to the possible construction of a new feedermain on Highway 55 to service Jarvis and Caledonia.

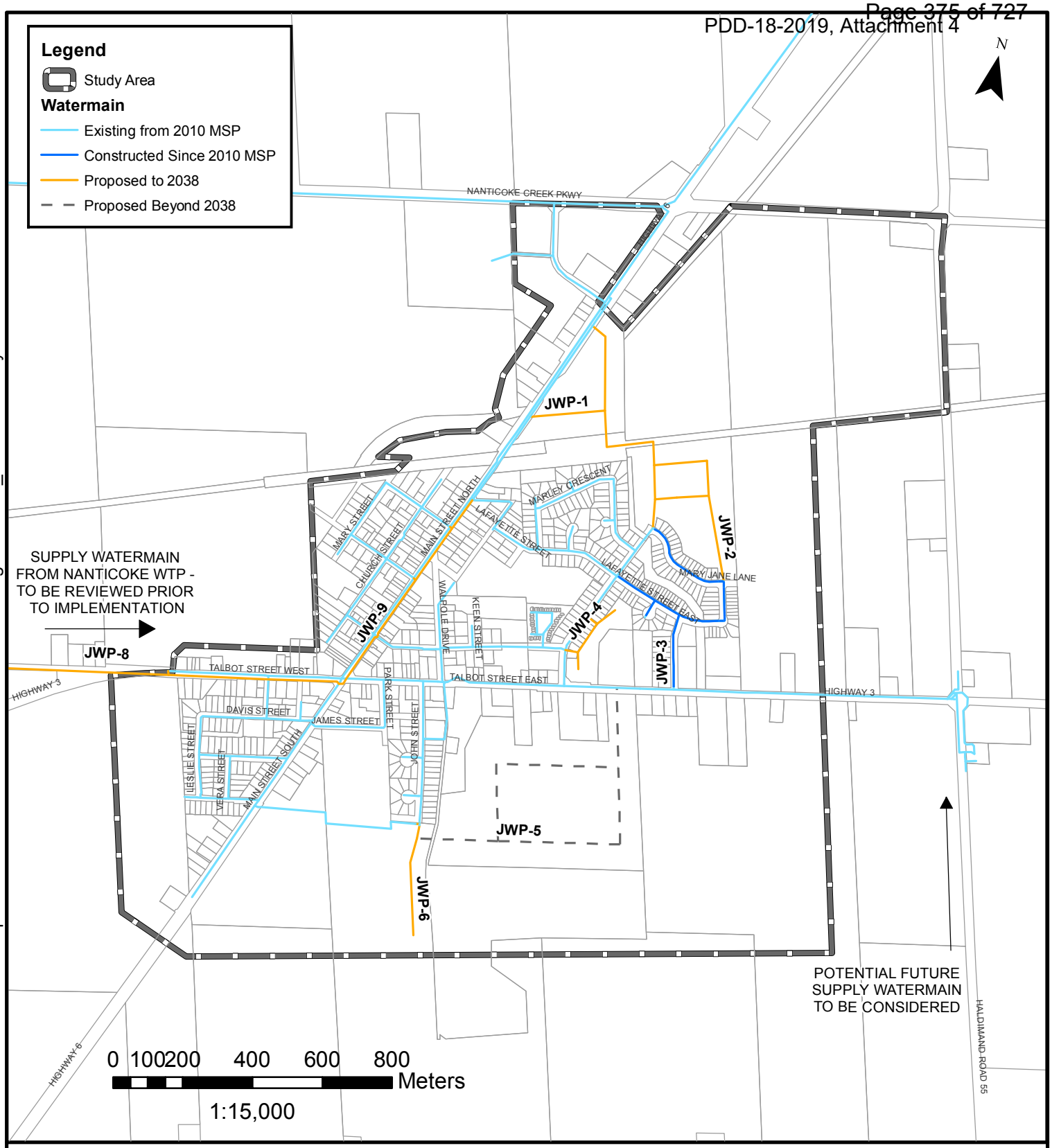
Updates to the proposed water distribution system since the 2010 MSP are summarized in Section 4.2.

4.1.2 Water Storage

An elevated storage tank located at the north-east of Townsend provides storage for both Jarvis and Townsend. The storage volume provided by the tank is 2,300 m^3 and there is adequate storage to serve anticipated 20-year growth.

4.2 Updated Preferred Alternative and Implementation

Required projects and cost estimates were updated for the various water distribution projects proposed in the 2010 MSP. A summary of the projects and costs is provided in Figure 3 and Table 1. The total cost of the proposed upgrades to meet 20-year projected demands is $4,636,000.



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JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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FUTURE (2038) WATER DISTRIBUTION SYSTEM

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FIGURE 3

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Table 1 Cost Estimates and Timing of Preferred Water Servicing Alternative

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JWP-1	150/250 mm ø Watermain Aligned on Vacant Parcel B in North End of Town	No change from 2010 MSP, updated for inflation.	$323,000	$0	0%	100%	Development
JWP-2	150/200/250 mm ø Watermain Aligned on Northern Portion of Jarvis Meadows	Partially constructed since 2010 MSP, cost adjusted and updated for inflation.	$822,000	$0	0%	100%	Development
JWP-3	200mm ø Watermain Aligned on Southern Portion of Jarvis Meadows	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Development
JWP-4	150mm ø Watermain Aligned on Walker Development	No change from 2010 MSP, updated for inflation.	$178,000	$0	0%	100%	Development
JWP-5	150/200 mm ø Watermain Aligned on Vacant Parcel 14 in South End of Town	Required beyond 20-year (2038) planning horizon.	$0	$1,059,000	0%	100%	Development
JWP-6	150 mm ø Watermain Aligned on Milmont and 200 mm ø Watermain adjoining to Main St.	No change from 2010 MSP, updated for inflation.	$558,000	$0	0%	100%	Development
JWP-8	400 mm ø Watermain Aligned West Concession 7, and Main Street South of Talbot (From Nanticoke)	No change from 2010 MSP, updated for inflation.	$2,197,000	$0	To be determined	To be determined	Allocation and timing subject to further assessment
JWP-9	400 mm ø Watermain Aligned on Main Street North of Talbot	No change from 2010 MSP, updated for inflation.	$558,000	$0	0%	100%	Development
Total Watermain Cost to 2038			**$4,636,000**	**$1,059,000**			

5.0 WASTEWATER SERVICING ALTERNATIVES UPDATE

5.1 Future Servicing Requirements and Evaluation

5.1.1 Wastewater Collection System

In Work Package 2 (JLR, June 7, 2019) the wastewater collection model was updated to include future population growth to 2038. In the 2010 MSP, two alternatives were considered. The primary difference between Alternative 1 and 2 was the servicing of vacant lots located at the north end of Jarvis on the east and west side of Highway 6 and the servicing of a vacant lot on the southeast side of Jarvis. The flow to pipe capacity ratio was updated and reviewed for both alternatives (refer to Appendix B). As found in the 2010 MSP, both options perform similarly in terms of addressing issues related to pipe capacity. Alternative 1 continues to be the preferred, due to the lower cost of implementation and operation.

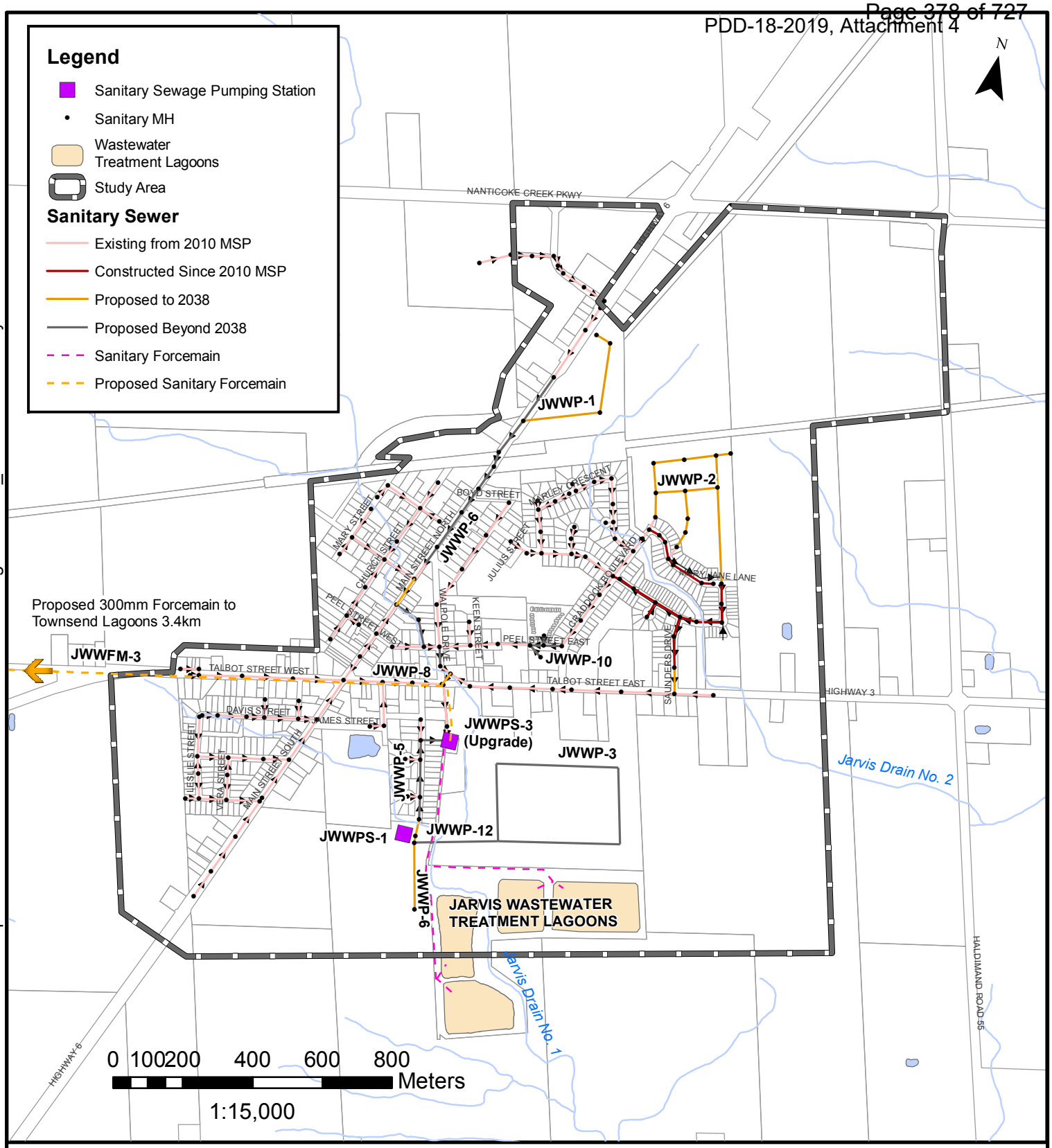
The extended future collection system is shown in Figure 4. Sewermain extensions to serve development anticipated in the 20-year planning horizon (2038) are shown in orange. In the 2010 Master Servicing Plan, consideration was given to servicing vacant lands beyond the 20-year planning horizon. Sewermain extensions to serve these vacant lands are shown in grey. Updates to the proposed collection system since the 2010 MSP are summarized in Section 5.2.

5.1.2 Jarvis Wastewater Pumping Station and Lagoons

The capacity of the Jarvis Wastewater Pumping Station and Lagoons was reviewed as part of a separate Municipal Class EA for Additional Treatment Capacity for Jarvis (JLR, 2019). The preferred alternative arising from the Class EA is to construct a forcemain to the Townsend Sewage Pumping Station (or directly to the Townsend Lagoon) and upgrade the pumps at the Jarvis Sewage Pumping Station. The projects are included in Section 5.2 and details can be found in the Jarvis Wastewater Treatment Capacity Class EA, to be presented to council June 2019.

5.2 Updated Preferred Alternative and Implementation

Required projects and cost estimates were updated for the various collection system projects proposed in the 2010 MSP. A summary of the projects and costs is provided in Figure 4 and Table 2. The total cost of the proposed upgrades to meet 20-year projected demands is $7,524,000.



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FUTURE (2038) WASTEWATER COLLECTION SYSTEM

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FIGURE 4

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Table 2 Cost Estimate and Timing of Preferred Wastewater Servicing Alternative

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JWWPS-1	Milmont 20.0 L/s PS	To meet 20-year demands an initial pump capacity (~5L/s - 15L/s) is recommended to avoid downstream collection system upgrades. Cost updated for inflation.	$781,000	$200,000	0%	100%	Development
JWWFM-1	Forcemain from Milmont PS to Existing John Street Sewer	No change from 2010 MSP, updated for inflation.	$45,000	$0	0%	100%	Development
JWWPS-3	Jarvis SPS Upgrade, replacement of three (3) existing pumps with three larger pumps	Refer to Class EA for Additional Treatment Capacity for Jarvis (JLR, 2019).	$440,000	$0	0%	100%	2019
JWWFM-3	Forcemain from Jarvis SPS to Townsend	Refer to Class EA for Additional Treatment Capacity for Jarvis (JLR, 2019).	$4,960,000	$0	0%	100%	2019
Pumping Stations and Forcemain to 2038 Sub-Total			**$6,226,000**	**$200,000**			
JWWP-1	Vacant Lots ‘A’, ‘B’, and ‘C’ (200 mm ø)	No change from 2010 MSP, updated for inflation.	$301,000	$0	0%	100%	Development
JWWP-2	Jarvis Meadows Subdivision (200 mm ø)	Partially constructed since 2010 MSP, cost estimate adjusted and updated for inflation.	$708,000	$0	0%	100%	Development

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JWWP-3	Vacant Lot 14 Development (200 mm ø)	Required beyond 20-year (2038) planning horizon.	$0	$680,000	0%	100%	Development
JWWP-4	Milmont Subdivision (200 mm ø)	No change from 2010 MSP, updated for inflation.	$190,000	$0	0%	100%	Development
JWWP-5	Pipe Upgrade – John Street from Reynolds Court (250 mm ø) to Jarvis PS (450 mm ø)	Not required in 20-year planning horizon due to altered PS downstream, could be upsized in future if lifecycle is reached, pump could then be also replaced to facilitate greater development with same wet well.	$0	$178,000	0%	100%	Development
JWWP-6	Pipe Upgrade – Main Street from 280 m North of CN-CP Right-of- Way to Peel Street (250 to 375 mm ø)	Only some portions required in 20-year (2038) planning horizon, adjusted lengths and updated for inflation.	$98,000	$492,000	0%	100%	Development
JWWP-8	Pipe Upgrade – Walpole Street from Peel Street to Talbot Street (300 to 375 mm ø)	Only some portions required in 20-year (2038) planning horizon. Pipe upgrade – Walpole Street from Peel Street to Talbot Street - must be regraded to allow sufficient flow (300 to 375 mm ø). Costs updated for adjusted lengths and inflation.	$19,000	$93,000	0%	100%	Development

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JWWP-10	Pipe Replacement – Peel Street East at Craddock Boulevard (200 mm ø)	Sections are operating at between 90% and 100% of capacity however entire stretch of Craddock is 200mm and all would need upgraded to avoid downsizing pipes or regraded to achieve slopes - no flooding issues recorded, do not upgrade.	n/a	n/a	0%	100%	Development
JWWP-12	Vacant Lot 14 Development – Drain Crossing (200 mm ø)	Required beyond 20-year (2038) planning horizon.	$0	$167,000	0%	100%	Development
Sewermain to 2038 Sub-Total			**$1,316,000**	**$1,610,000**			
Total Wastewater Cost to 2038			**$7,524,000**	**$1,810,000**			

6.0 STORMWATER SERVICING ALTERNATIVES UPDATE

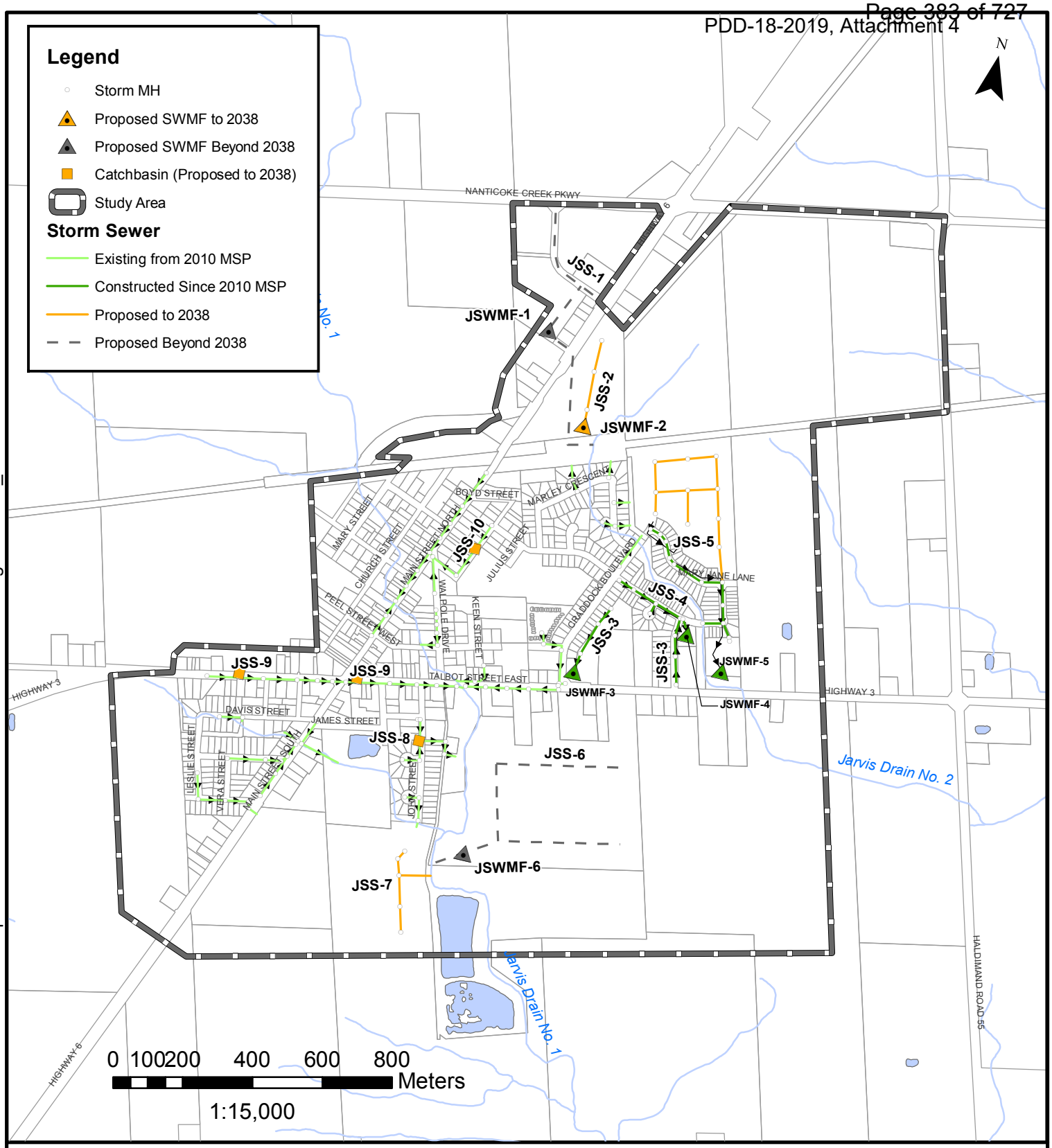
6.1 Future Servicing Requirements and Evaluation

In Work Package 2 (JLR, June 7, 2019) the stormwater conveyance model was updated to include future population growth to 2038. In the 2010 MSP a long list of potential storm water servicing strategies was developed to identify feasible stormwater management options for each of the main development areas. The list was comprehensive and covers a wide range of options available today. The flow capacity of storm sewers was updated and reviewed under the proposed storm water management solution (refer to Appendix C). As found in the 2010 MSP, the proposed solution was able to address the issues identified under the 20-year growth scenario.

The proposed storm water management system is shown in Figure 6. Stormwater infrastructure to serve development anticipated in the 20-year planning horizon (2038) is shown in orange. In the 2010 Master Servicing Plan, consideration was given to servicing vacant lands beyond to 20-year planning horizon. Stormwater infrastructure to serve these vacant lands are shown in grey. Updates to the proposed collection system since the 2010 MSP are summarized in Section 6.2.

6.2 Updated Preferred Alternative and Implementation

Required projects and cost estimates were updated for the various stormwater management projects proposed in the 2010 MSP. A summary of the projects and costs is provided in Figure 5 and Table 3. The total cost of the proposed upgrades to meet 20-year projected demands is $1,516,000.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

FUTURE (2038) STORMWATER DRAINAGE SYSTEM

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FIGURE 5

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Plot Date: May 14, 2019 9:59:06 AM

Table 3 Cost Estimate and Timing of Preferred Stormwater Servicing Alternative

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JSS-1	525-900 mm ø Site Sewer	Required beyond 20-year (2038) planning horizon.	$0	$1,227,000	0%	100%	Developer
JSS-2	450-600 mm ø Site Sewer	No change from 2010 MSP, updated for inflation.	$268,000	$0	0%	100%	Developer
JSS-3	450 mm ø Site Sewer	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Developer
JSS-4	300-750 mm ø Site Sewer	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Developer
JSS-5	300-900 mm ø Site Sewer	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Developer
JSS-6	675-975 mm ø Site Sewer	Required beyond 20-year (2038) planning horizon.	$0	$1,583,000	0%	100%	Developer
JSS-7	300-450 mm ø Site Sewer	No change from 2010 MSP, updated for inflation.	$925,000	$0	0%	100%	Developer
JSS-8	Catchbasin Inlet Control Device on John Street	No surcharge to surface in model, upgrade if there is a flooding issue or lifecycle renewals are required.	n/a	n/a	100%	0%	Not required
JSS-9	Catchbasin Inlet Control Device on Talbot Street West End; Additional Inlet Capacity at Talbot Street and Main Street	No surcharge to surface in model, upgrade if there is a flooding issue or lifecycle renewals are required.	n/a	n/a	100%	0%	Not required
JSS-10	Catchbasin Inlet Control Device on Monson Street	Not required due to Monson Street upgrades.	n/a	n/a	100%	0%	Not required

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JSS-11	375-750 mm ø Sewer Aligned on Lafayette, Craddock and Peel St.	Not required due to alternative solution under construction.	n/a	n/a	75%	25%	Under construction
Stormsewers to 2038 Sub-Total			**$1,193,000**	**$2,810,000**			
JSWMF-1	Quantity and Quality Control Wet Pond	Required beyond 20-year (2038) planning horizon.	$0	$413,000	0%	100%	Development
JSWMF-2	Quantity and Quality Control Wet Pond	No change from 2010 MSP, updated for inflation.	$323,000	$0	0%	100%	Development
JSWMF-3	Quantity and Quality Control Wet Pond	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Development
JSWMF-4	Quantity and Quality Control Wet Pond	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Development
JSWMF-5	Quantity and Quality Control Wet Pond	Constructed since 2010 MSP, no longer required.	n/a	n/a	0%	100%	Development
JSWMF-6	Quantity and Quality Control Wet Pond	Required beyond 20-year (2038) planning horizon.	$0	$691,000	0%	100%	Development
Stormwater Management Facility to 2038 Sub-Total			**$323,000**	**$1,104,000**			
Total Stormwater Infrastructure Costs to 2038			**$1,516,000**	**$3,914,000**			

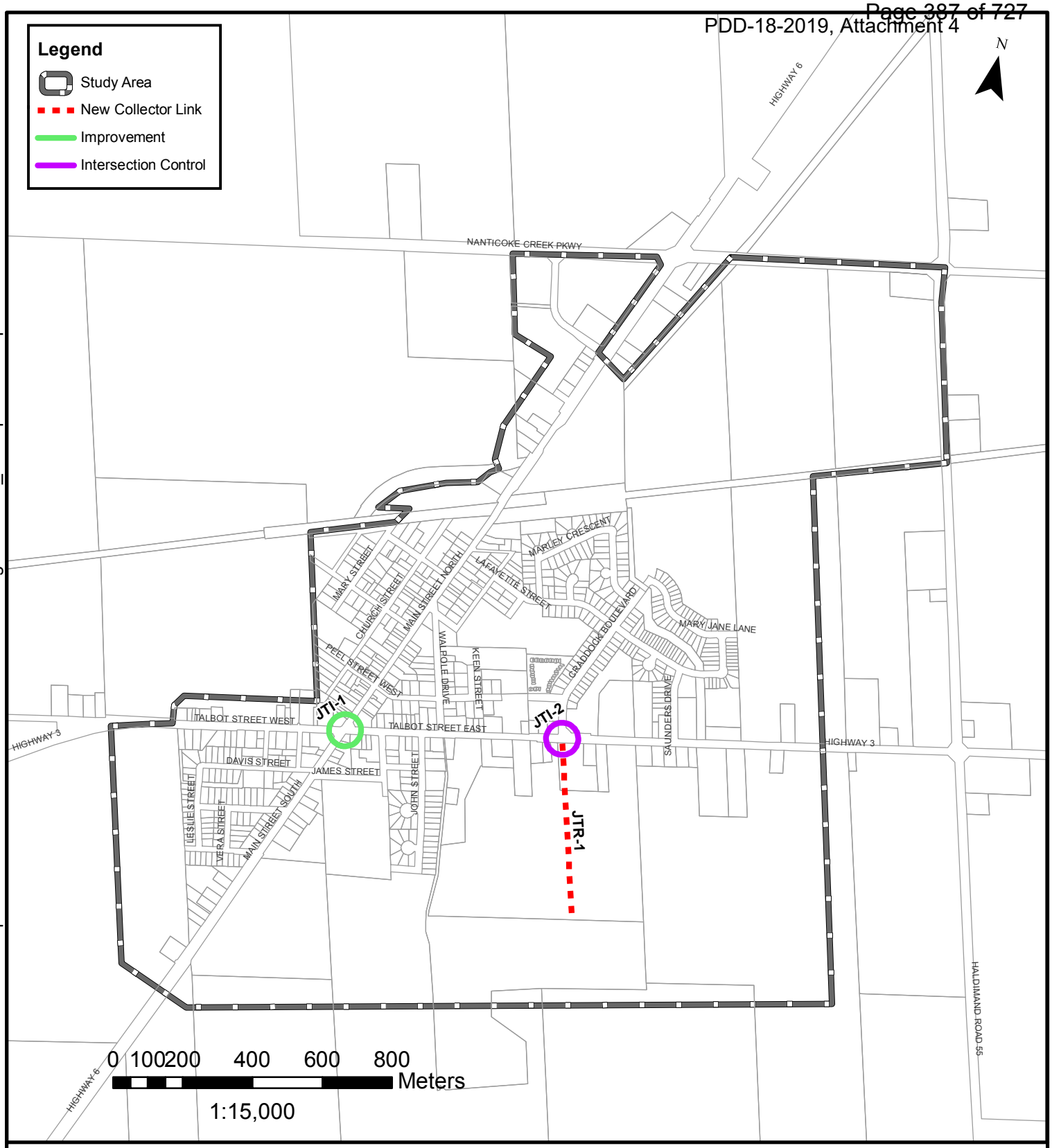
7.0 TRANSPORTATION SERVICING ALTERNATIVES UPDATE

7.1 Future Servicing Requirements and Evaluation

In Work Package 2 (JLR, June 7 2019) the transportation model was updated to include future population growth to 2038. The proposed transportation system is shown in Figure 6. Updates to the proposed transportation system since the 2010 MSP are summarized in Section 7.2.

7.2 Updated Preferred Alternative and Implementation

Required projects and cost estimates were updated for the various transportation projects proposed in the 2010 MSP. A summary of the projects and costs is provided in Figure 6 and Table 4. The total cost of the proposed upgrades to meet 20-year projected growth is $1,060,000.



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

TRANSPORTATION IMPROVEMENTS

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FIGURE 6

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Plot Date: June 4, 2019 9:23:55 AM

Table 4 Cost Estimate and Timing of Preferred Transportation Alternative

2010 MSP System Component	Description	Review Comment	Updated Cost Estimate 2018-2038 (2018$)	Updated Cost Estimate >2038 (2018$)	Funding		Trigger/ Timing
					County	Developer	
JTI-1	Talbot Street West – Main Street South. Intersection Improvement – provide auxiliary lanes	No change from 2010 MSP, updated for inflation (may need to deduct for work already completed).	$446,000	$0	100%	0%	0 - 5 years
JTI-2	Talbot Street East – New Collector. Intersection Improvement – signalization	This is not required to service 20-year growth projections. Project would have to meet MTO warrents and is being considered as part of MTO's planning.	n/a	$0	TBD	TBD	Development
JTR-1	New Collector	Required beyond 20-year (2038) planning horizon. Updated for inflation.	$0	$2,230,000	0%	100%	Development
JTR-2	Main Street North. Improved Street Design.	No longer required.	n/a	n/a	100%	0%	0 - 5 years
JTR-3	Talbot Street. Improved bicycle and pedestrian environment.	No longer required.	n/a	n/a	100%	0%	Development
		Transportation to 2038 Total	**$1,060,000**	**$2,230,000**			

8.0 CONCLUSION

This work package has been prepared for the exclusive use of Haldimand County, for the stated purpose. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Haldimand County and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Jane Wilson, P.Eng.
Environmental Engineer

Reviewed by

Michael Troop, P.Eng.
Senior Environmental Engineer

9.0 REFERENCES

Haldimand County Services and Planning Division. Design Criteria, Version 4.0, April 2015.

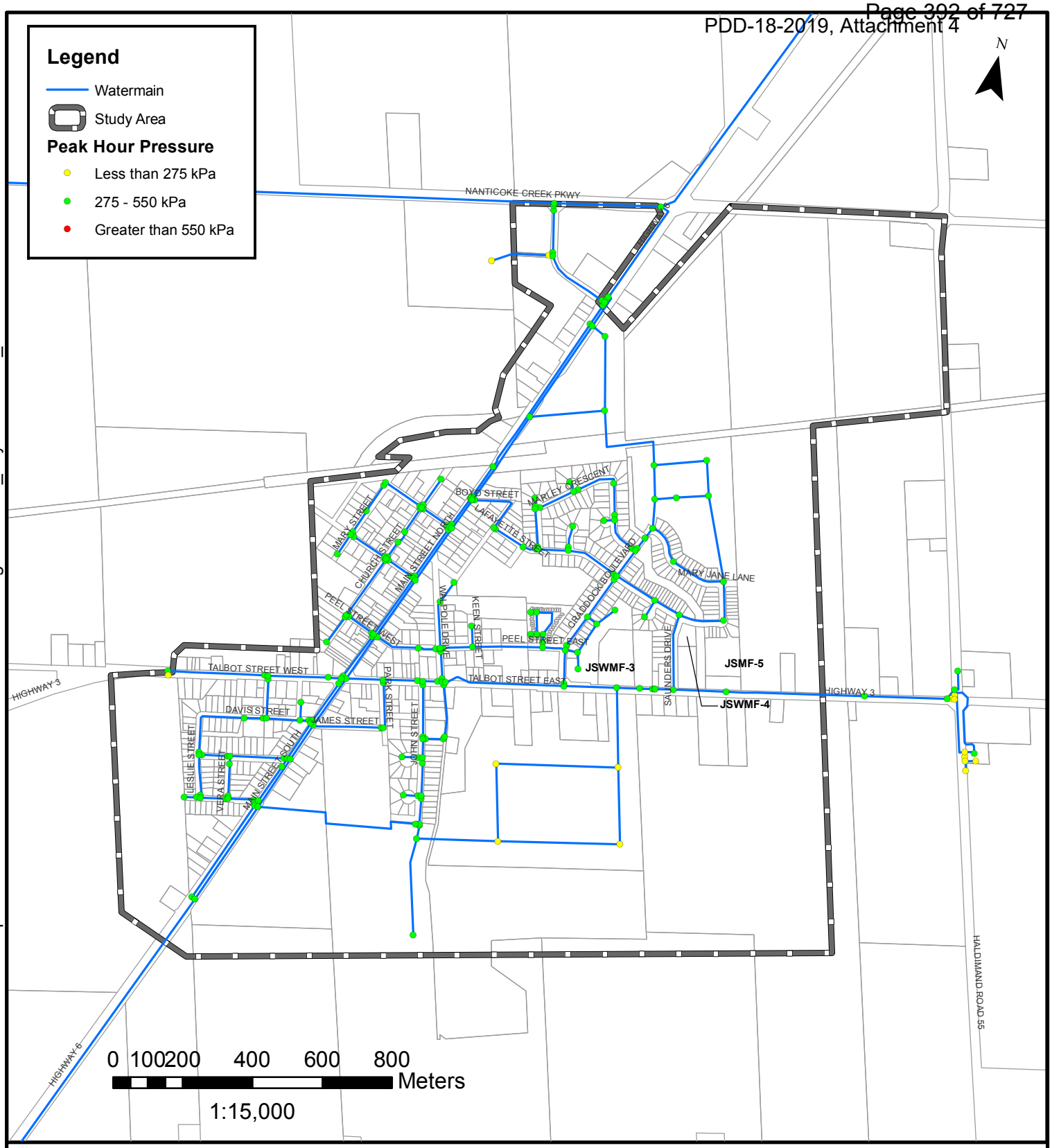
Ministry of the Environment, Conservation and Parks. *Design Guidelines for Sewage Works*, 2008.

Watson & Associates Economists Limited. *Population, Housing and Employment Projections Study Update, 2016-2046 - Preliminary Draft Findings*. October 2018.

Watson & Associates Economists Limited. *Haldimand County Development Charge Background Study*, April 2014.

Appendix A

Water



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

PROPOSED SYSTEM PRESSURES UNDER PEAK HOUR DEMAND - ALTERNATIVE 1

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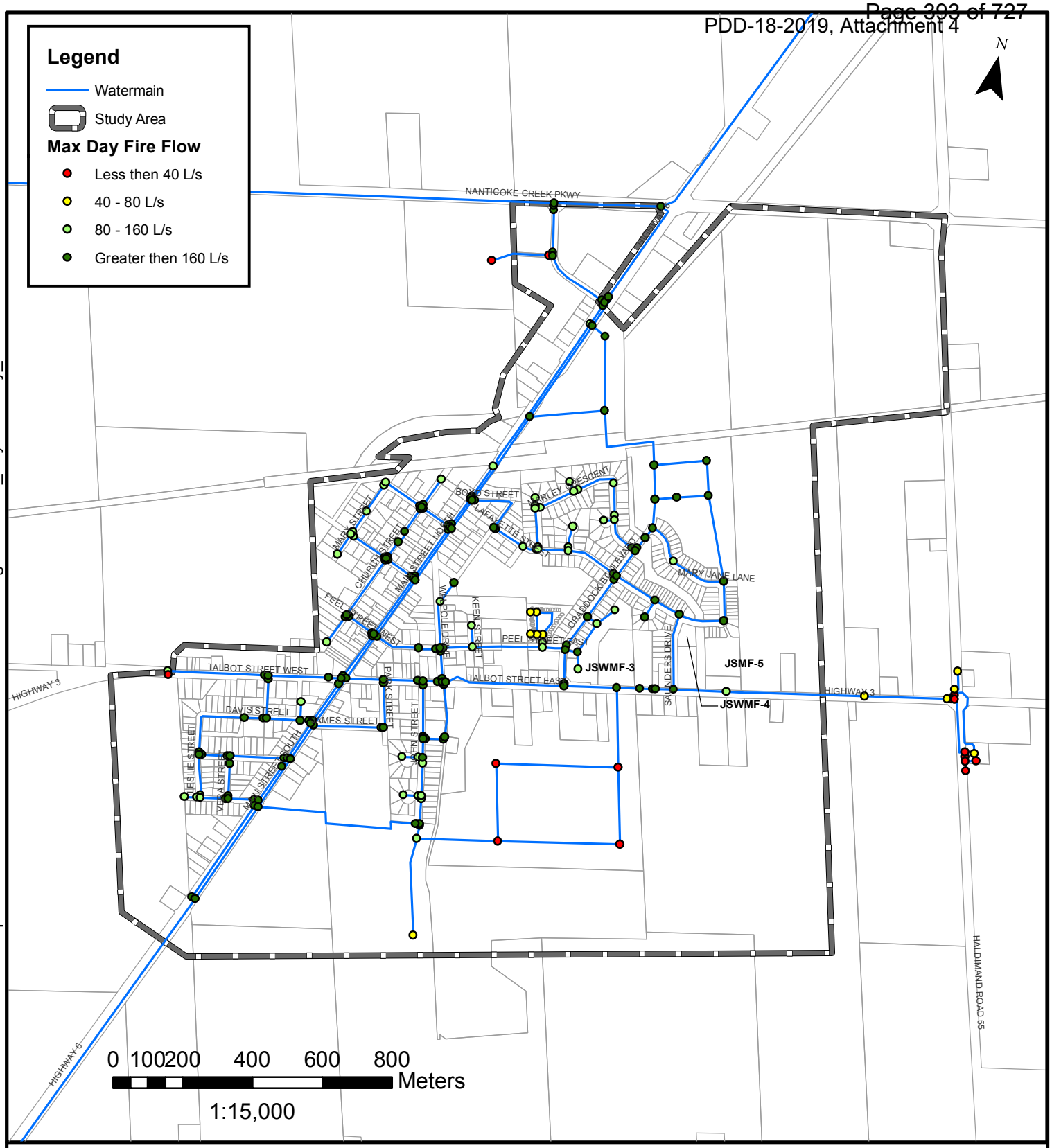

PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

PROPOSED AVAILABLE FIRE FLOW UNDER MAXIMUM DAY DEMAND - ALTERNATIVE 1

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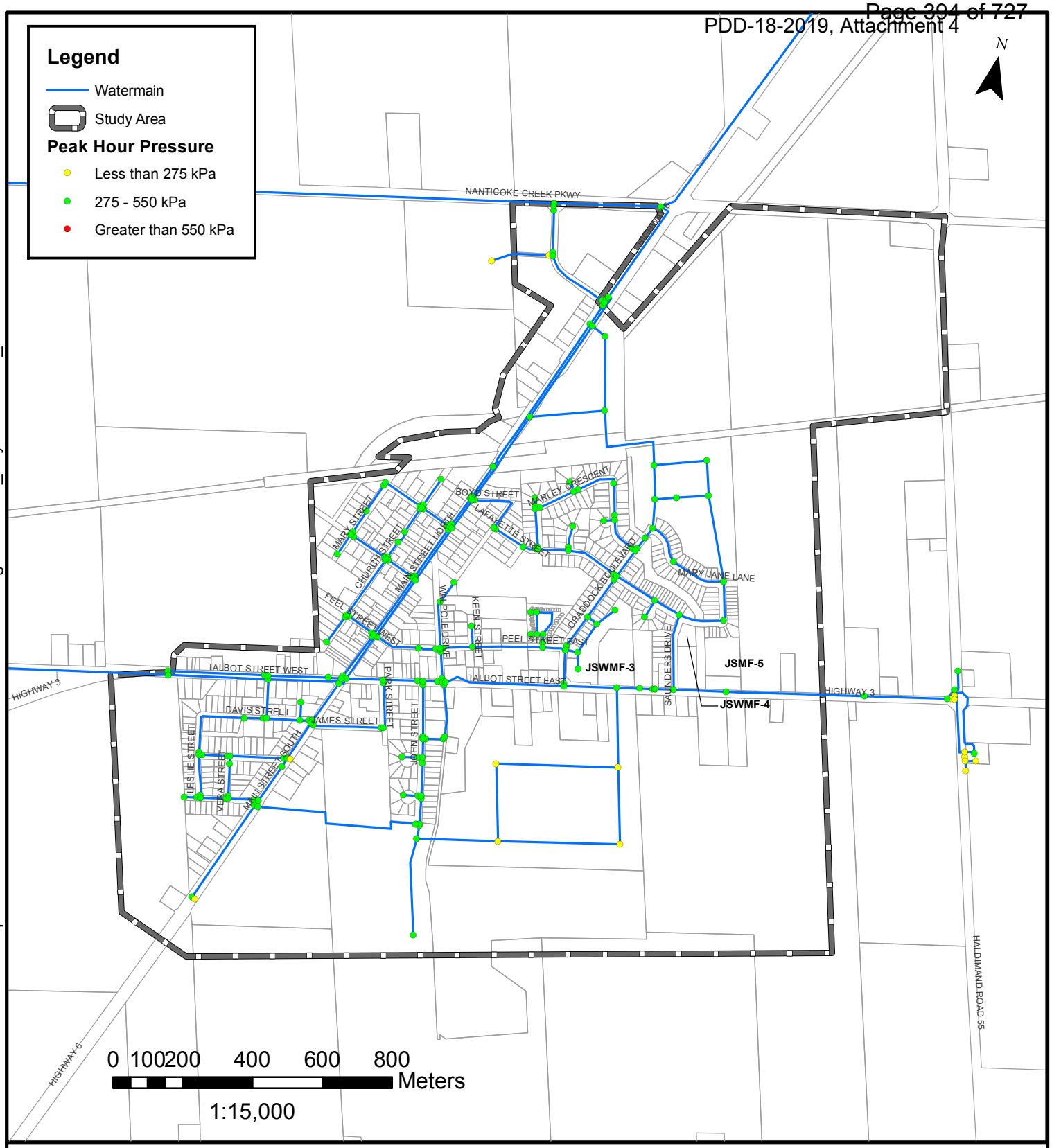

PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

PROPOSED SYSTEM PRESSURES UNDER PEAK HOUR DEMAND - ALTERNATIVE 2

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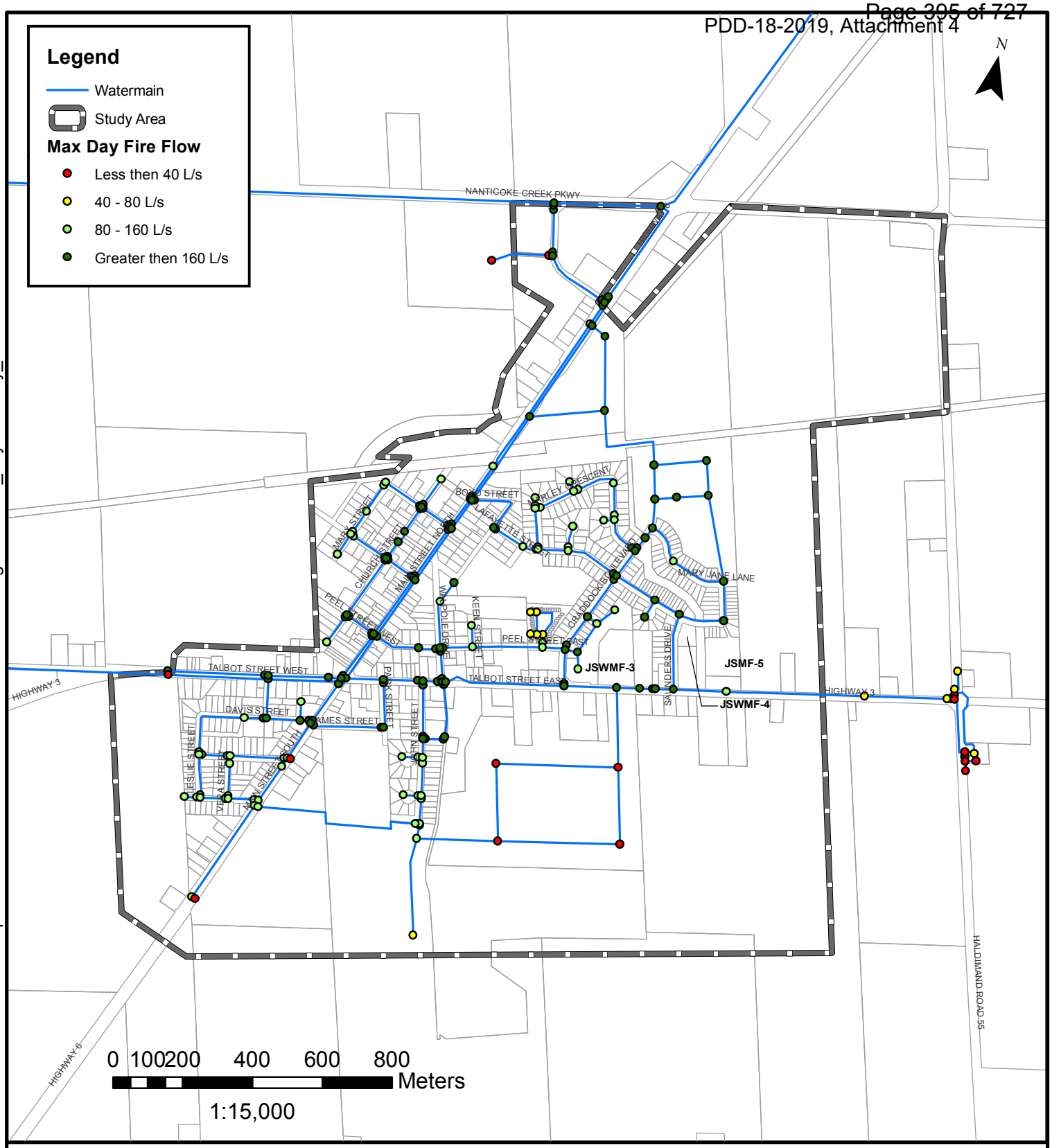

PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

PROPOSED AVAILABLE FIRE FLOW UNDER MAXIMUM DAY DEMAND - ALTERNATIVE 2

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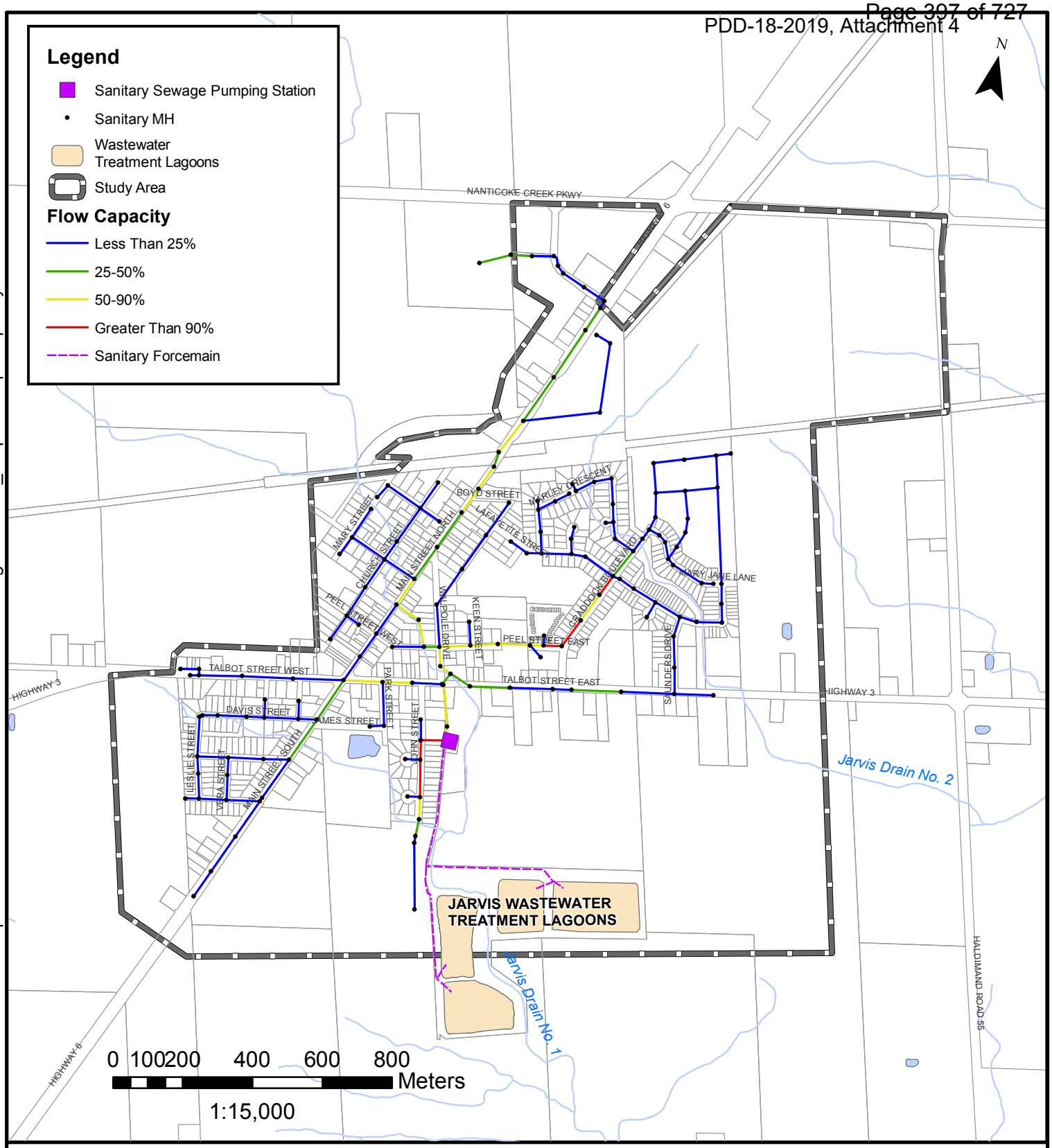
Appendix B

Wastewater



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

PROPOSED (2038) FLOW TO PIPE CAPACITY RATIO

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File Location: P:\28000\28176-000 - Jarvis Master Plan Update\3-Production\1-Civil\GIS\Work Package 3\28176_ProposedPipeCapacity.mxd

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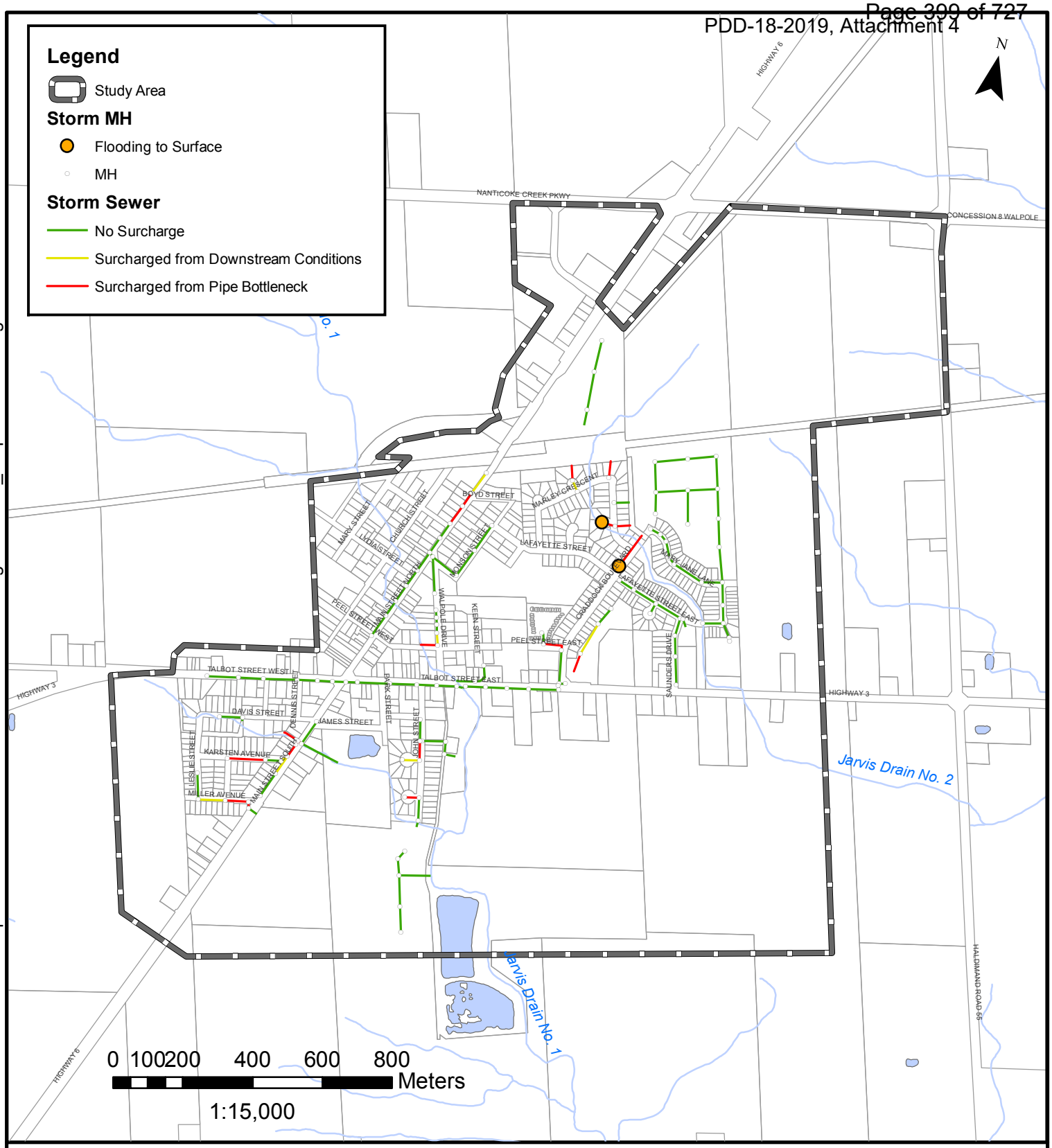
Appendix C

Stormwater



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

PROPOSED (2038) SURCHARGE TO SURFACE MAP UNDER 5-YEAR

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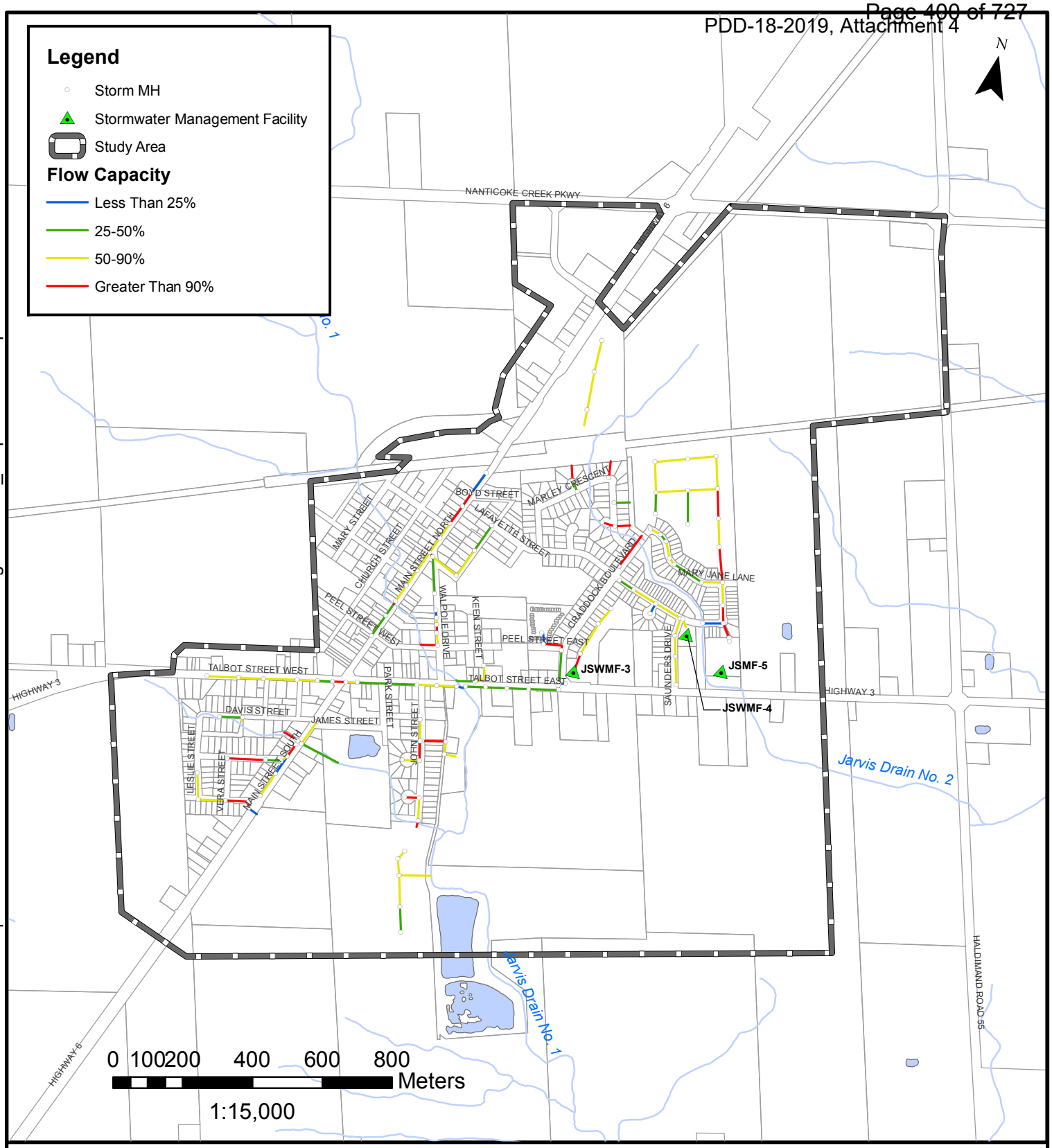

PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

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PROPOSED (2038) FLOW TO PIPE CAPACITY RATIO

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Plot Date: May 14, 2019 8:18:32 AM

Appendix D

Transportation Report

Memorandum

07 June 2019
Project: 180197

To
Jane Wilson
Environmental Engineer
J.L. Richards & Associates Limited

From
Rajan Philips, P.Eng.
Senior Transportation Consultant
Paradigm Transportation Solutions Limited

RE: JARVIS MASTER SERVICING PLAN, TECHNICAL MEMORADUM 3, 2010 MSP REVIEW

Haldimand County is undertaking an update of the 2010 Master Servicing Plan (MSP) for the community of Jarvis in support of planned growth and intensification identified in the County's Official Plan. This Memo (**Table 1**) summarizes the transportation recommendations of the 2010 MSP, and their current review status.

TABLE 1: REVIEW OF 2010 MSP RECOMMENDATIONS

2010 MSP Recommendations	Review Comments
1. Monitoring and implementing mitigative measures (i.e. parking restrictions, revised lane designations) to improve intersection operations at Talbot Street (Highway 3) and Main Street (Highway 6) intersection. <u>Cost Estimate:$400,000</u>	• Talbot/MainStreet intersection is identified for improvements in the current update. • Nanticoke Creek Parkway and Highway 6 intersection is also identified for improvements. • Potential improvements will require MTO review/approval. <u>Cost Allocation:</u> Allocate $400,000, subject to deducting for work already completed.

2. Highway 6 By-pass: Need for a new collector road connecting to Highway 3 (Talbot Street) to accommodate developments in southwest Jarvis. Cost Estimate: $550,000	• This is not required to service 20-year growth projections. Also, it is beyond the scope of the Jarvis Master Plan, and is being considered as part of MTO's planning. Cost Allocation: Not required
3. Main Street North. Improved Street Design. $300,000	• No further improvements are required. Cost Allocation: Not required.
4. Talbot Street. Improved bicycle and pedestrian environment. Cost Estimate: $250,000	• No further improvements are required. Cost Allocation: Not required.

The 2010 MSP recommended $950,000.00 for Talbot Street / Main Street improvements. The updated cost allocation totals about $400,00 subject to detailed cost estimates.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

Rajan Philips
M.A.Sc., P.Eng, FITE
Senior Transportation Consultant

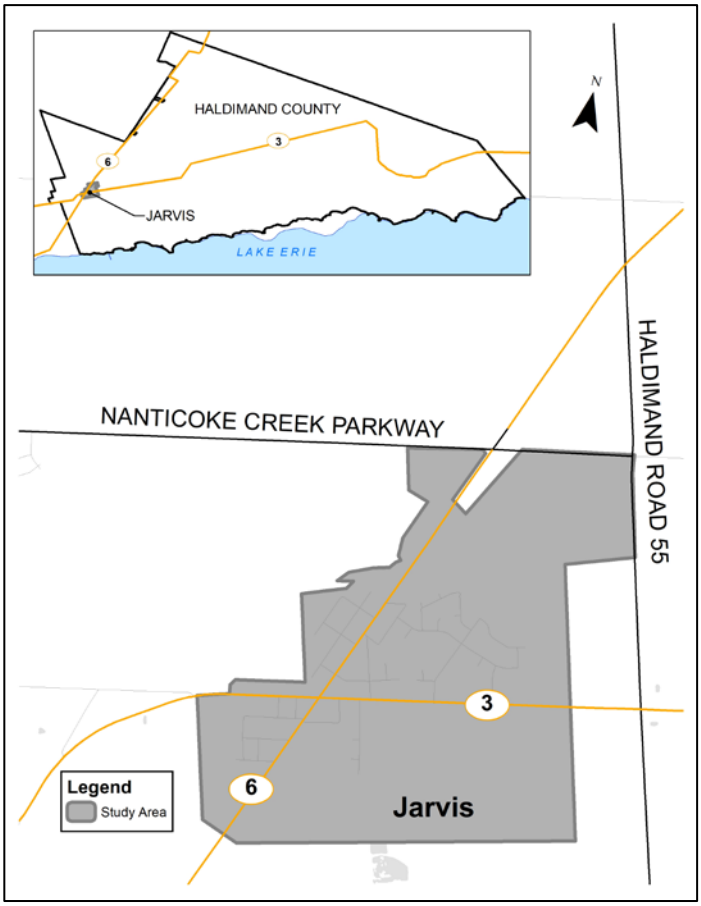
Appendix D

Notice of Study Commencement and Distribution List

Notice of Study Commencement

Jarvis Master Servicing Plan Update

Haldimand County has initiated a Municipal Class Environmental Assessment (Class EA) to update the Master Servicing Plan (MSP) prepared in 2010 for the community of Jarvis.



Map of the Master Plan Update Study Area

How Will This Affect Me?

The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area. The updated Master Plan will guide future infrastructure projects in the community.

Public and agency consultation is a key element of the process and input will be sought throughout the study to inform the evaluation and section of the preferred Master Servicing Plan.

How Do I Get More Information?

A mailing list for notification of study status and opportunities for public input is being compiled. If you wish to add your contact information to the study mailing list, or if you have any questions regarding the study, please visit our website or contact one of the people listed below.

A Public Open House is planned for 2019. Details will be posted on the County's website and advertised in local media, once finalized.

Michael Troop, P.Eng.	Peter Minkiewicz
Manager, Senior Environmental Engineer J.L. Richards & Associates Limited 107-450 Speedvale Ave W Guelph, ON N1H 7Y6 Phone: 519-763-0713 ext. 6522	Supervisor, Planning & Development Haldimand County, Caledonia Satellite Office 45 Munsee Street North Cayuga, ON N0A 1E0 Phone: 905-318-5932 Ext. 6208

This study is being conducted according to the requirements of Phases 1 to 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act. This notice originally issued March 28, 2019.

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J.L. Richards
& Associates Limited
107-450 Speedvale Ave W
Guelph, ON Canada
N1H 7Y6
Tel: 519 763 0713
Fax: 519 763 9261

March 28, 2019
Our File No.: 28176

VIA: CANADA POST

Mr./Ms. Name
Job Title
Company
Address
City, PROV Postal Code

Dear: «Name»

Re: Notice of Commencement – Jarvis Master Servicing Plan Update

Haldimand County has initiated a Municipal Class Environmental Assessment (Class EA) to update the Master Servicing Plan prepared in 2010 for Jarvis. The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area.

This Master Servicing Plan Update is being completed with sufficient detail to fulfil the requirements for Schedule B projects (Approach #2) under the Municipal Class EA process. Consultation with interested parties will be an important part of this systematic process to identify and evaluate ways of providing water, wastewater, stormwater, and transportation services in Jarvis. The updated Master Plan will guide future infrastructure projects in the community.

A Notice of Commencement is being mailed to residents in the study area and to agencies and organizations that may have an interest in the study. A copy of the Notice is attached for your information. You are invited to join our mailing list and/or provide comments as the study progresses. You are also invited to attend the Public Open House – to be scheduled in 2019.

Responses can be emailed or mailed to the address provided in the Notice of Commencement or the attached comment form. If you have any questions or concerns, please contact the undersigned.

Yours very truly,

J.L. RICHARDS & ASSOCIATES LIMITED

Michael Troop, P.Eng.
Manager, Senior Environmental Engineer
J.L. Richards & Associates Limited
107-450 Speedvale Ave W
Guelph, ON N1H 7Y6

Peter Miniewicz
Supervisor, Planning & Development
Haldimand County, Caledonia Satellite Office
45 Munsee Street North
Cayuga, ON N0A 1E0

EJW:kb

CANADA'S BEST MANAGED COMPANIES

Haldimand County
Jarvis Master Servicing Plan Update

COMMENT FORM

Name (please print): _____ **Date:** _____

I represent a(n): (please select the most applicable)
☐ Resident ☐ Agency ☐ Public Interest Group ☐ Other Stakeholder _____ (please specify)

Do you wish to receive updates in regards to this project? ☐ YES ☐ NO

Contact Name _____

Agency (if applicable) _____

Address (number, street, apt. no.) _____

City, Province, Postal Code _____

Phone _____ Email _____

Please indicate any issue(s) that need to be explored/investigated as part of this Class EA:

Please provide any additional comments about this Class EA:

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Cayuga, ON N0A 1E0
Phone: 905-318-5932 Ext. 6208

Please return completed form to mtroop@jlrichards.ca

Note: Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record

Send	Method	Category	Company	Name	Title	Address 1	Address 2	Address 3	Telephone	Email
		Developer List	1456556 Ontario Inc			310 Queen Street	Dunnville ON	N1A1H9	905-774-4444	dunnville@remaxescarpment.com
		Developer List	1768886 Ontario Inc. O/A Carluke Developments	Carl Walker		7292 Haldibrook Rd.	Caledonia ON	N3W 2G8	Carl-905-961-3669-Luke905-719-7604	carlwalker@shaw.ca
		Developer List	2036356 Ontario Inc.			25 Leaside Place	Hamilton ON	L9C 3W6		
		Developer List	2039882 Ontario Inc.	Mario Bevacqua		70 East Beaver Creek Rd Suite 1	Richmond Hill On	L4B 3B2	(905) 764-6423	mario.bevacqua@sympatico.ca
		Developer List	663947 Ontario Inc.	Laird McKeen		2 Greendale Drive	Caledonia ON	N3W 1H8	905-765-4034	laird@bellnet.ca
		Developer List	Accu II Development Corp.	Peter Bezemer		PO Box 2082	Caledonia ON	N3W 2G6	905-570-2304	plbez.accu2@sympatico.ca
		Developer List	ADJ Ventures Inc.	Dan Valentini		48 Doleman Street	Stoney Creek ON	L8J 2P2		dvalentini2@cogeco.ca
		Developer List	Albert Postma Const.	Albert Postma		745 Marshall Rd.	Dunnville ON	N1A 2W8		a.postma@shaw.ca
		Developer List	Armstrong Planning	Michal Audong		125 Villarboit Crescent	Vaughan, ON	L4K 4K2	416-444-3300, ext, 3002	michael@armstrongplan.ca
		Developer List	Ballantry Homes	Bobby Bhoola		20 Cachet Woods Crt, Suite 6	Markham, ON	L6C 3G1		bobby@ballantryhomes
		Utilities	Bell Canada	Attn: Circulations Intake, Planning & Environ	MMM Group Limited	100 Commerce Valley Drive West	Thornhill, ON	L3T 0A1		circulations@mmm.ca
		Local Agencies	Brant-Haldimand-Norfolk Catholic District School Board			322 Fairview Drive P.O Box 217	Brantford, ON	N3T 5M8		
		Developer List	Build Toronto	David Prakash		200 King Street West Suite 200	Toronto ON	M5H 3T4	416-981-3619	pdavid@buildtoronto.ca
		Developer List	c/o Metrus Development Inc.	Hagersville Holdings Ltd		30 Floral Parkway	Concord ON	L4K 4R1	905-669-5571	dsteedman@metrusdev.com
		Developer List	CALLOWAY REIT	Gus Tsoraklidis		700 Applewood Cres. Suite 200	Vaughan ON	L4K 5X3	905-326-6400 ext.7726	sjurji@callowayreit.com
		Developer List	Camplor Properties Ltd	Pat Campea		6110 Regional Road 13	Glanbrook ON	L0R 1C0	905-3352353	hank.huitema@amec.com
		Utilities	Canada Post Corporation	Connie Richardson	Delivery Planning Officer	955 Highbury Ave	London, ON	N5Y 1A3	519-521-0176 (Cell)	connie.richardson@canadapost.ca
		Developer List	Cardi Construction	Mario Cardinali		60-0 Nebo Road RR 2	Hannon ON	L0R 1P0	905-630-3122	info@cardiconstruction.com
		Developer List	Cardi Construction	Ray Rocci		60-0 Nebo Road RR 2	Hannon ON	L0R 1P0	905-630-3122	ray@cardiconstruction.com
		Developer List	Century 21	Rose Crane		350 Rutherford Road S Unit 10	Brampton ON	L6W 3M2	905-455-7965	BIN2@ROGERS.COM
		Developer List	Chrisdom Homes Inc	Donald Plouffe		3044 Lakeshore Road	Burlington ON	L7N 1A1	905-632-5940	info@plouffehomes.ca
		Developer List	Civic Planning Solutions Inc.	David Roe		599 Larch Street	Delhi ON	N4B 3A7	519-582-1176	dfrfez@me.com
		Developer List	Clark Company Ltd.	Jason Clark		186 Greens Road	Caledonia ON	N3W 1X2	905-765-4401	jclark@theclarkcompanies.com
		Federal Departments and Ag	CN Rail	CN Railway Properties		1 Administration Rd	Concord, ON	L4K 1B9		Proximity@cn.ca
		Developer List	Coldwell Banker Miller Realty	Jack Huitema		220 Broad Street E	Dunnville ON	N1A 1G2	905-774-7624	jack-huitema@coldwellbanker.ca
		Developer List	Community Expansion Inc	Earl Orth		1183 King St. E.	Kitchener ON	N2G 2N3	519-745-1142	
		Local Agencies	Conseil Scolaire Catholique Mon Avenir	Nadine J. Tischhauser	Planner, Service de la Planification	110 Avenue Drewry	Toronto, ON	M2M 1C8		
		Local Agencies	Conseil Scolaire Viamonde	Jason Rodrigue	Surintendant des affaires	Suite 101 – 1 Vanier Drive	Welland, ON	L3B 1A1		
		Local Agencies	Conseil Scolaire Viamonde	Miguel Ladouceur	Directeur de l'immobilisation, de l'entretien	116 Cornelius Parkway	North York, ON	M6L 2K5		
		Developer List	Corcorp	Rick Shaw		3407 Sawmill Valley Dr.	Mississauga ON	L5L 3A3	416-587-2907	rickshawland@hotmail.com
		Developer List	Dabirian Homes Inc.	Nasser Dabirian		12 Shoreline Rd	Grimsby ON	L3M 5B2	905-515-3836	ndabirian@cogeco.ca
		Developer List	Diamante Holdings	Dominic Diamante		292 James Street N	Hamilton ON	L8R 2L3	905-528-5562	
		Developer List	Earthtech Canada Inc	Joseph J. Gemin		50 Sportsworld Crossing Road Unit 290	Kitchener ON	N2P 0A4	519-650-5313	
	MAIL RETURNED	~~Developer List~~	~~Empire Continental Mgt.~~	~~Daniel Guizzetti~~		~~123 Commerce Valley Dr. East Suite 800~~	~~Richmond Hill On~~	~~L3T 7W7~~	~~905-307-8102~~	~~dgguizzetti@empirecommunities.com~~
		Federal Departments and Ag	Environment and Climate Change Canada	Rob Dobos	Manager, Environmental Assessment Secti	867 Lakeshore Rd.	Burlington, ON	L7S 1A1	905-336-4953	rob.dobos@canada.ca
		Developer List	G. Douglas Vallee Ltd	John Vallee		The Old Firehall 2 Talbot Street N.	Simcoe ON	N3Y 3W4	519-426-6270	johnvallee@gdvallee.ca
		Developer List	G. Douglas Vallee Ltd	Michael Higgins		2 Talbot Street N.	Simcoe ON	N3Y 3W4	519-426-6270	michaelhiggins@gdvallee.ca
	MAIL RETURNED	~~Developer List~~	~~Gamsby & Mannerow Ltd~~	~~Paul McLennan~~		~~210-255 Woodlawn Road W~~	~~Guelph ON~~	~~N1A 8J1~~	~~519-824-8150~~	~~pmclennan@gamsby.com~~
		Developer List	GEDSB	Dan Whalen		349 Erie Avenue	Brantford ON	N3T 5V3	519-756-6306 ext.281191	dan.whalen@granderie.ca
		Local Agencies	Grand Erie District School Board	Michelle Le Dressay	Planning Officer	349 Erie Avenue	Brantford, ON	N3T 5V3	519-756-6306 Ext. 281150	michelle.ledressay@granderie.ca
		Local Agencies	Grand River Conservation Authority	Nathan Garland	Resource Planner	400 Clyde Road P.O Box 729	Cambridge, ON	N1R 5W6	519-621-2763 Ext. 2237	ngarland@grandriver.ca
		Developer List	GSP Group			72 Victoria St. Suite 201	Kitchener ON	N2G 4Y9		
		County	Haldimand County - Building & By-law Division	David McPherson	CSO	45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Development & Design Section	Greg P		45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Development & Design Section	Michal Maisor		45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Development & Design Section	Tim Dickhout		45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Economic Development Division	Lidy Romanuk	CAB	45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Emergency Services and Fire Department	Al Gee	CAB (EMS)	45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Environmental Services - Water & Wastewater	Warren Wight	CSO	45 Munsee Street North P.O Box 400	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Public Works - Roads Operations	Danielle Fletcher	Kohler	1162 Kohler Road	Cayuga, ON	N0A 1E0		
		County	Haldimand County - Waste Management	David Pressey	Kohler	1162 Kohler Road	Cayuga, ON	N0A 1E0		
		Utilities	Haldimand County Hydro Inc.	Clark Boughner		1 Greendale Dr	Caledonia, ON	N3W 2J3		cboughner@hchydro.ca
		Utilities	Haldimand County Hydro Inc.	Paul Heeg	Complex Proposals	1 Greendale Dr	Caledonia, ON	N3W 2J3		pheeg@hchydro.ca
		Utilities	Haldimand County Hydro Inc.	Waes Lemstra		1 Greendale Dr	Caledonia, ON	N3W 2J3		wlemstra@hchydro.ca
		Local Agencies	Haldimand Norfolk Health Unit - Health and Social Services	Michelle Lyne	Program Manager, Community Health	P.O Box 570 12 Gilbertson Drive	Simcoe, ON	N3Y 4N5		
	MAIL RETURNED	~~Developer List~~	~~HBK Holdings Inc.~~	~~Henry DeKlerk~~		~~205 South Cayuga St. E.~~	~~Dunnville ON~~	~~N1A 1C5~~	~~905-774-7568~~	~~kzantingh@armstrongmilling.com~~
		Developer List	Henco Industries Ltd	Don & John Henning		4147 River Road	Caledonia ON	N3W 1T6		dandjhenning@mountaincable.net
		Developer List	HML Holdings	John Edelman		42 Talbot St. E. PO Box 279	Cayuga ON	N0A 1E0	905-772-3636	arda@haldimandmotors.ca
		Utilities	Hydro One Networks Inc.	Julie Thomson	Zone 2, Lines Customer Support Clerk, Sin	70 Victoria Street	Simcoe, ON	N3Y 1L5	519-426-4446 Ext. 2259	Julie.Thomson@HydroOne.com
	EMAIL	Utilities	Hydro One Networks Inc.	Patrick Garvie	SDT, Haldimand Ops Centre				905-765-7330	Patrick.Garvie@HydroOne.com
		Utilities	Hydro One Networks Inc.	Real Estate Services		483 Bay St 12th Floor N Tower	Toronto, ON	M5G 2P5		Landuseplanning@hydroone.com
		Utilities	Hydro One Networks Inc.			70 Victoria Street	Simcoe, ON	N3Y 1L5	519-426-4446	Zone2scheduling@hydroone.com
	MAIL RETURNED	~~Developer List~~	~~Ian Neville & Assoc. Inc.~~	~~Ian Neville~~		~~2032 Summer Wind Dr.,~~	~~Burlington ON~~	~~L7M 2T8~~	~~905-336-6039~~	~~ian.neville@mac.com~~
		Developer List	IBI Group			360 James Street 200 East Wing	Hamilton ON	L8L 1H5	905-546-1010	George.Zajac@IBIGroup.com
		Developer List	J H Cohoon Engineering Ltd.	Bob Phillips		440 Hardy Road, Unit 1	Brantford ON	N3T 5L8	905-753-2656	rphillips@cohooneng.com
		Developer List	J.L. Cowan Ltd	Stephen Cowan		110 Brookfield Blvd	Dunnville ON	N1A 2Y4	905-774-5751	stephencowan@sympatico.ca
		Developer List	Jewitt & Dixon	Rick Dixon OLS		51 Park Road	Simcoe ON	N3Y 4J9	519-426-0842	surveyors@amtelecom.net
		Developer List	John Voortman & Associates	John Voortman Jr.		218 Carluke Road West	Ancaster ON	L9G 3L1	(905) 971-3314	jmvoortman@bell.net
		Developer List	JP Woolley Surv.	J P Woolley OLS		125 Nairne Street	Caledonia ON	N0A 1A0	905-765-0181	patwoolley@mountaincable.net
		Developer List	KALOS Engineering	Hank Huitema		875 Main St W #3,	Hamilton, ON	L8S 4P9		hankh@kaloseng.ca
		Developer List	Kenneth Isaac Arch.	Kenneth Isaac		9 Cudmore Road	Oakville ON	L6L 2Y4	905-825-5248	kia@cogeco.ca
		Developer List	KLS Engineering	Dean Glenney		448 Haldimand Road 17 RR5	Dunnville ON	N1A W4	905-774-4307	dean@klsengineering.ca
		Developer List	Loblaw Props Ltd.	Louie Loberti		1 Presidents Choice Circle	Brampton ON	L6Y 5S5	905-459-2500	
		Local Agencies	Long Point Region Conservation Authority	Bonnie Bravener	Resource Technician	4 Elm Street	Tillsonburg, ON	N4G 0C4	1-888-231-5408 Ext. 233	bbravener@lprca.on.ca
		Local Agencies	Long Point Region Conservation Authority	Leigh-Anne Bower	Planning Technician	4 Elm Street	Tillsonburg, ON	N4G 0C4	1-888-231-5408 Ext. 229	lbower@lprca.on.ca
		Developer List	Losani Homes			203-430 McNeilly Road	Stoney Creek, ON	L8E 5E3	905-561-1700	lroberts@losanihomes.com
	MAIL RETURNED	~~Developer List~~	~~Mattamy Dev. Corp~~	~~Ian G. MacPherson~~		~~2360 Bristol Circle~~	~~Oakville ON~~	~~L6H 6M5~~	~~905-829-2424~~	~~ian.macpherson@mattamycorp.com~~
		Developer List	McKenzie Meadows – Phase 1	Michael Corrado		2 Hostein Drive,	Ancaster ON	L9G 2S5		mcorrado1@cogeco.ca
		Local Agencies	Metro Loop			675 Tradewind Drive Unit 2	Ancaster, ON	L9G 4V5		haldimand.ucc@metroloop.net
		Developer List	Metropolitan Consulting	Kevin Gonnsen		4450 Paletta Crt	BURLINGTON, ON	L7L 5R2	289-208-4716	kggonnsen@metrocon.ca
		Developer List	MHBC Planning	Dave Astin		200 - 540 Bingemans Centre Drive	Kitchener, ON	N2B 3X9	519-576-0121	dastin@mhbcplan.com
		Developer List	Millmount Group	Barry & Doug Miller		PO Box 396	Hagersville ON	N0A 1H0	519-587-3024	
		Provincial Agencies	Ministry of Agriculture, Food and Rural Affairs	Drew Crinklaw	Rural Planner	667 Exeter Road	London, ON	N6E 1L3	519-873-4085	drew.crinklaw@ontario.ca
		Provincial Agencies	Ministry of Indigenous Affairs			9th Floor, 160 Bloor St E	Toronto, ON	M7A 2E6		
		Provincial Agencies	Ministry of Municipal Affairs - Affairs & Housing	David Stubbs	Planner	2nd Floor, 659 Exeter Rd	London, ON	N6E 1L3	519-873-4031	david.stubbs@ontario.ca
		Provincial Agencies	Ministry of Natural Resources and Forestry	Niagara District Office		P.O Box 5000, 4890 Victoria Avenue N.	Vineland Station, ON	L0R 2E0		
		Provincial Agencies	Ministry of Natural Resources and Forestry - Guelph District	Tara McKenna	District Planner	1 Stone Road West	Guelph, ON	N1G 4Y2	519-826-4912	tara.mckenna@ontario.ca
		Provincial Agencies	Ministry of Tourism, Culture and Sport	Karla Barboza	Team Lead - Heritage (Acting)	401 Bay St Suite 1700	Toronto, ON	M7A 0A7	416-314-7120	karla.barboza@ontario.ca
		Provincial Agencies	Ministry of Transportation - Corridor Management Section - Engineering Office	John Morrisey	Corridor Management Planner	659 Exeter Road	London, ON	N6E 1L3	519-873-4597	john.morrisey@ontario.ca
		Developer List	Mississaugas of the New Credit First Nation			2789 Mississauga Road RR#6	Hagersville ON	N0A 1H0		
		Indigenous Peoples	Mississaugas of The New Credit First Nation - Department of Consultation and Acc	Fawn D. Sault		4056 Highway 6 North	Hagersville, ON	N0A 1H0	905-768-4260	Fawn.Sault@mncfn.ca
		Local Agencies	Municipal Property Assessment Corporation (MPAC)	Lynne Cunningham	Account Manager Municipal and Stakehold	659 Upper James Street Suite 201	Hamilton, ON	L9C 5R8	905-546-8548	Lynne.Cunningham@mpac.ca , MR19-20Enquiry@mpac.ca
		Local Agencies	Niagara Peninsula Conservation Authority	Cara Lampman	Watershed Planner	250 Thorold Road West; 3rd Floor	Welland, ON	L3C 3W2	905-788-3135 Ext. 272	clampman@npca.ca
		Developer List	Ontario Land Service	Gene Rusza		4003 Mountain Street	Beamsville ON	L0R 1B7	905-563-8162	erusza@sympatico.ca
		Developer List	Ontario Power Generation	John Ferguson		700 University Ave Room H7 D10	Toronto ON	M5G 1X6	416-592-2555	john.l.ferguson@opg.com
		Developer List	R F Almas Co Ltd			2146 Regional Road 18	Hagersville ON	N0A 1H0	905-768-3170	rfalmascoltd@aol.com
		Developer List	Rasch & Hyde Ltd. Ontario Land Surveyors	Des Rasch OLS		1333 Highway 3 East	Dunnville ON	N1A 2Z1	905-774-7188	drasch@raschandchambers.ca
		Developer List	Ray Edwards C. Realty	Ray Edwards		662 Fennell Ave. E.	Hamilton ON	L8V 1V1	905-575-5967	raycedwards@mountaincable.net
		Developer List	RE/MAX Escarpment Realty Inc	Peter & Chuck Hogeterp		325 Winterberry Drive Suite 101	Hamilton ON	L8J 0B6	905-573-1188	
	MAIL RETURNED	~~Developer List~~	~~Remax Escarpment Realty Inc.~~	~~Ron Hewitt~~		~~550 Fennell Avenue East, Suite221A~~	~~Hamilton ON~~	~~L8V 4S9~~	~~905-575-5478~~	~~rhewitt@remaxescarpment.com~~

	Developer List	Riverside Realty	Fred Moodie		310 Queen Street	Dunnville ON	N1A 1H9	905-774-4444	fred@riversideralty.ca
	Developer List	Riverside Realty	Richard Schilstra		310 Queen Street	Dunnville ON	N1A 1H9	905-774-4444	richard@riversiderealty.ca
EMAIL	Utilities	Rogers - Subdivisions and Condominium Apps	Ryan Rodrique						ryan.rodrigue@rci.rogers.com
	Developer List	Ros-Bay Developments	Phil Lavallee		3300 Bloor Street West West Tower Suite 670	Toronto ON	M8X 2X2		
	Developer List	Royal LePage State Realty	Anthony Costa		1122 Wilson Street West	Ancaster On	L9G 3K9		
	Developer List	Sco-Terra Consulting Group Ltd.	Richard J. Pellerin		321 Dufferin Ave.	London ON	N6B 1Z3	519-434-0278 Cell-519-319-7057	
	Indigenous Peoples	Six Nations Council - Six Nations The Manager	Dawn LaForme		Eco-Centre PO Box 5000	Ohsweken, ON	N0A 1M0	519-753-0665	dlaforme@sixnations.ca
	Developer List	Six Nations Lands and Resources			2498 Chiefswood Road P.O. Box 5000	Ohsweken ON	N0A 1M0		
	Developer List	SmartCentres	Peter Nikolakakos		700 Applewood Cres. Suite 200	Vaughan ON	L4K 5X3	905-760-6200 ext. 7262	pnikolakakos@smartcentres.com
	Developer List	SPRIET ASSOCIATES	J.R. Spriet		155 York Street	London ON	N6A 1A8	519-672-4100	mail@spriet.on.ca
	Developer List	Tarmco Construction	Archie Merigold		1333 Highway 3 East RR 8	Dunnville ON	N1A 2W7	905.774.3598	amerigold@tarmco.com
	Developer List	The Pelican Group	John Vanreenen		2368 Haldimand Road 17	Cayuga ON	N0A 1E0	905-772-3644	jvrn25@mountaincable.net
	Developer List	Toscani Developments	Gino Toscani		7060 Airport Road	Mt. Hope ON	L0R 1W0	905-679-4943	toscani@nas.net
	Developer List	Toscani Developments	Gino Toscani		7060 Airport Road	Mt. Hope ON	L0R 1W0		
	Utilities	Union Gas	Shirley Brundritt	Lands Dept.	50 Keil Drive North	Chatham, ON	N7M 5M1		ONTUGGLLandsINQ@spectraenergy.com
	Utilities	Union Gas	Shirley Brundritt	Lands Dept.	50 Keil Drive North	Chatham, ON	N7M 5M1		ONTUGLLandsINQ@uniongas.com
	Developer List	Upper Canada Consultants	Jason Schooley		30 Hannover, Unit #3	St. Catharines, ON	L2W 1A3	905-688-9400	jschooley@ucc.com
	Developer List	Upper Canada Consultants	Martin Heikoop		30 Hannover, Unit #3	St. Catharines, ON	L2W 1A3	905-688-9400	mheikoop@ucc.com
	Developer List	Urbex Engineering Ltd.	Angelo Cameracci		161 Rebecca Street	Hamilton ON	L8R 1B9	905-522-3328	acameracci@urbex.biz
	Developer List	van der Woerd & Associates Ltd.	Steve van der Woerd		3600 Billings Court Suite 100	Burlington ON	L7N 3N6	905-333-9698	svanderwoerd@vdwengineering.com
	Developer List	Venture Homes	John Kragten		PO Box 2131	Caledonia ON	N3W 2G6	905-765-4624	kragtens@mountaincable.net
	Developer List	W. Murray Clark Ltd.	Ron Clark		186 Greens Road	Caledonia ON	N3W 1X2		rclark@theclarkcompanies.com
	Developer List	White Coad LLP	Gordon Klein		5 Wellington Street North	Woodstock ON	N4S 6P1	519-421-1500	
	Developer List	WOOD Group	Jim Enos		3450 Harvester Road, Suite 100	Burlington ON	L7N 3W5	905-335-2353	
	Developer List	Youngs Kenneth Engineering Inc.			6195 Milburough Line	BURLINGTON, ON	L0R 1B0	905-336-3327	kyeinc@nor-del.com
MAIL RETURNED	~~Developer List~~	~~Zelinka Priamo Ltd~~	~~Jonathan Rodgers~~		~~5399 Eglinton Ave Suite 202~~	~~Toronto ON~~	~~M9C 5K6~~	~~416-622-6064~~	~~'jonathan.r@zpplan.com'~~
MAIL RETURNED	~~Developer List~~	~~Zelinka Priamo Ltd~~	~~Melissa Melville~~		~~5399 Eglinton Ave Suite 202~~	~~Toronto ON~~	~~M9C 5K6~~	~~416-622-6064~~	~~melissa.m@zpplan.com~~
	Developer List		Bruce MacDonald		245 Argyle Street S	Caledonia ON	N3W 1K7	905-765-4495	bruce@gbrucemacdonald.ca
	Developer List		Dan Silverthorne		1408 Bird Road	Dunnville ON	N1A 2W2	905-774-3565	dsilverthorne@bellnet.ca
	Developer List		Isaac Phillips		PO Box 8	Dunnville ON	N1A 1X2	905-774-8144	isaac@isaacphillips.com
	Developer List		John Voortman		218 Carluke Road W	Ancaster ON	L9G 3L1	905-648-4757	jev@mountaincable.net
	Developer List		Mary J. Donnell		PO Box 984	Simcoe ON	N3Y 5B3	519-429-3848	
	Developer List		Patricia Moore		45 Jamieson Drive	Caledonia ON	N3W 2K6	289-284-1175	pmoore@hotmail.ca
	Developer List		Ronald K Winegard		23 Forfar Street West	Caledonia ON	N3W 1J5		
	Developer List		Sep Ruuska OLS		17 Nelson Street	Brantford ON	N3T 2M6	519-752-0038	
	Developer List		Ted Powell		3 Latham St	Cayuga ON	N0A 1E0	905-772-5387	dmpowel@mountaincable.net

From: Peter Minkiewicz
To: "Fawn.Sault@mncfn.ca"; "pgeneral@sixnations.ca"
Cc: Mike Evers; Jane Wilson
Subject: Jarvis Master Servicing plan update
Date: April 17, 2019 2:42:36 PM
Attachments: 28176 Jarvis Lagoon Class EA NOC PIC_R01.docx
28176 Jarvis MSP Update NOC_2019-03-25.pdf

Hello Paul and Fawn

Attached above are copies of the public notices for the commencement of the planned update to Jarvis Master Servicing Plan and the Notice of Commencement and

Public Information Centre Jarvis Schedule C Municipal Class Environmental Assessment for Additional Wastewater Treatment Capacity.

The Master Servicing Plan update is required to ensure the master servicing plan is up to date and contemplates growth in the short and long term planning horizon. The Municipal Class EA is related to the MSP update for Jarvis and relates to the need to identify options for additional wastewater Treatment capacity.

As has been our practice if there is a desire for us to come and overview these projects further we would be pleased to do so as staff.

Please let me know if there might be a preferred time and we can make arrangements for the meeting.

Thank

Peter Minkiewicz
Supervisor, Development Services
Planning & Development

Haldimand County
Hagersville Satellite Office

Tel: 905-318-5932 x6208
Fax: 905-768-7328
www.HaldimandCounty.ca

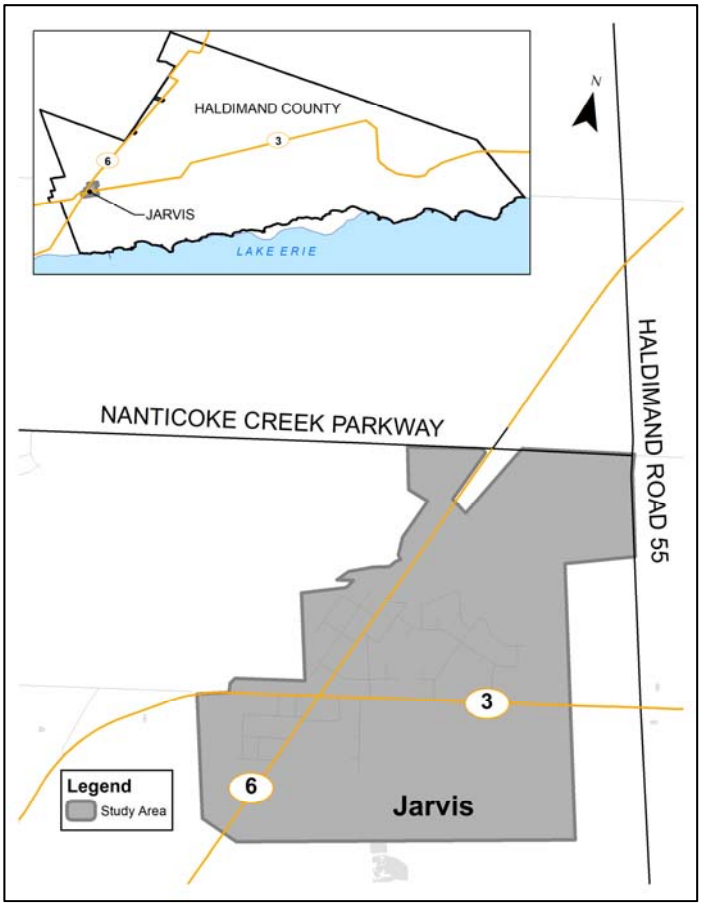
Appendix E

Public Information Centre Materials

Notice of Public Information Centre

Jarvis Master Servicing Plan Update

Haldimand County has initiated a Municipal Class Environmental Assessment (Class EA) to update the Master Servicing Plan (MSP) prepared in 2010 for the community of Jarvis.



Map of the Master Plan Update Study Area

How Will This Affect Me?

The purpose of the study is to update the four (4) servicing components (water, wastewater, stormwater, and transportation) of the 2010 Jarvis MSP to reflect updated land use and growth forecasts in the study area. The updated Master Plan will guide future infrastructure projects in the community.

Public and agency consultation is a key element of the process and input will be sought throughout the study to inform the evaluation and section of the preferred Master Servicing Plan.

How Do I Get More Information?

A mailing list for notification of study status and opportunities for public input is being compiled. If you wish to add your contact information to the study mailing list, or if you have any questions regarding the study, please visit our website or contact one of the people listed below. A Public Open House is being held at the date and time below.

Date: **Thursday, May 30, 2019**
Time: **4:00 – 6:00 pm**
Location: **Jarvis Library**
Address: **2 Monson St., Jarvis, ON**

Michael Troop, P.Eng.
Manager, Senior Environmental Engineer
J.L. Richards & Associates Limited
107-450 Speedvale Ave W
Guelph, ON N1H 7Y6
Phone: 519-763-0713 ext. 6522

Peter Minkiewicz
Supervisor, Planning & Development
Haldimand County, Caledonia Satellite Office
45 Munsee Street North
Cayuga, ON N0A 1E0
Phone: 905-318-5932 Ext. 6208

This study is being conducted according to the requirements of Phases 1 to 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act. This notice originally issued May 22, 2019.

Welcome

to the Public Information Centre
for the

Haldimand County
Jarvis Master Servicing Plan Update

We want to hear from you.

Please fill out the comment sheet from today's Public Information Centre and leave it in one of the boxes provided.

Additional information is available on the County's website at www.haldimandcounty.ca and at the Municipal Office.

HALDIMAND COUNTY

J.L.Richards
ENGINEERS · PLANNERS

THE MUNICIPAL CLASS EA PROCESS

Data Collection and Review → Identify Problems and Opportunities → Identify and Evaluate Solutions

Phase 1 – Problem/ Opportunity

WE ARE HERE
Consult with Review Agencies and Public

Select Preferred Alternative →

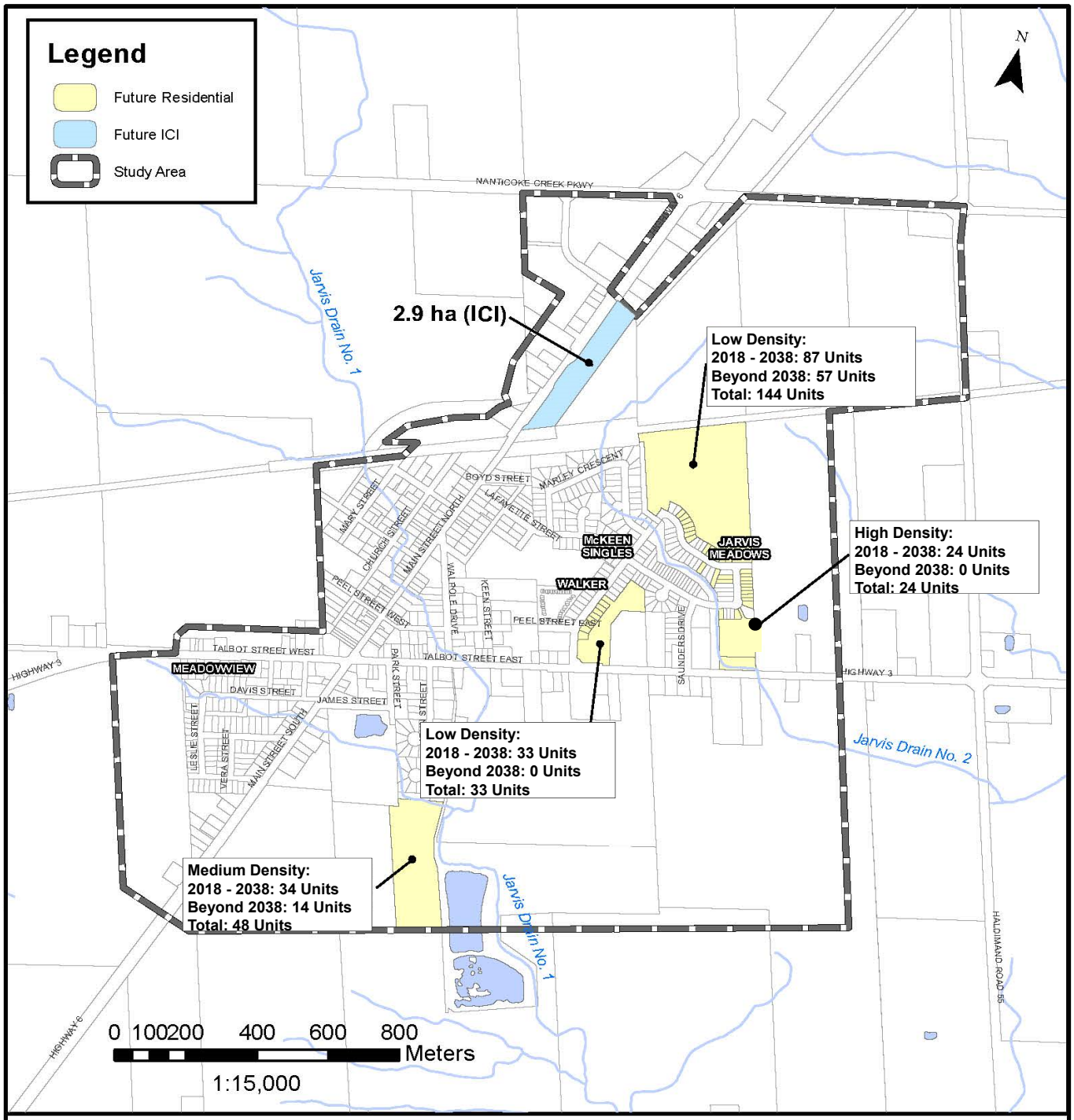
Issue Project File Report for 30-day Review
Summer 2019

Phase 2 – Alternative Solutions

Haldimand County is undertaking an engineering study to update the 2010 Jarvis Master Servicing Plan to evaluate the community's long-term infrastructure needs and identify a preferred solution to be implemented to match growth in Jarvis over the next 20 years.

EXISTING AND FUTURE CONDITIONS

Over 20 years, the anticipated population and household growth for Jarvis is an increase of 340 persons and 178 units respectively.



PROJECT:

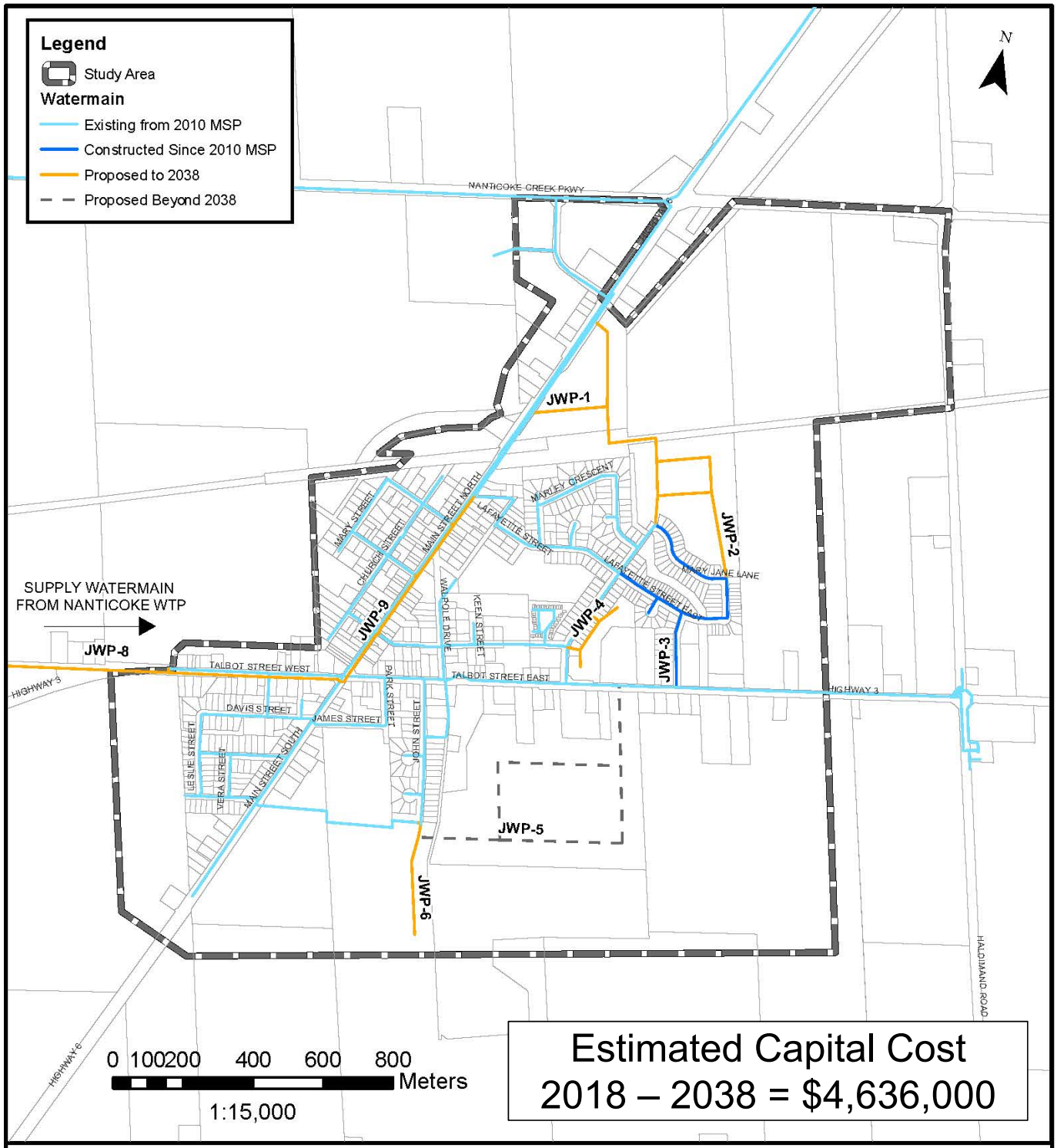
JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

ANTICIPATED DEVELOPMENT FROM 2018 TO 2038

PROPOSED WATER SERVICING



Estimated Capital Cost
2018 – 2038 = $4,636,000

PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE
JARVIS, HALDIMAND COUNTY, ONTARIO

DRAWING:

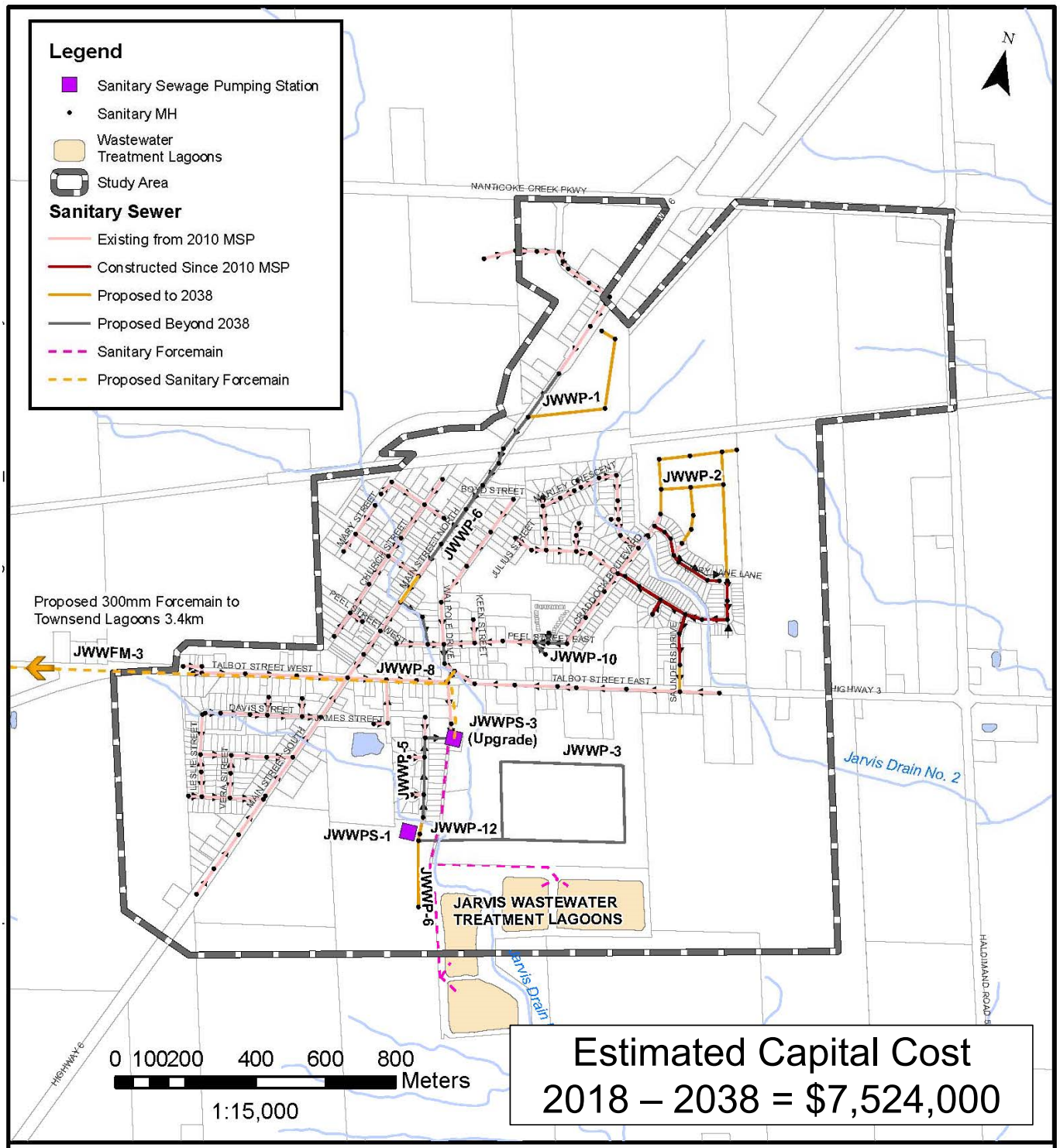
FUTURE (2038) WATER DISTRIBUTION SYSTEM

FIRE FLOW DESIGN CONSIDERATIONS

- Haldimand County is considering changes to Section J of the County's Design Criteria related to Fire Flow Requirements for new development
- Currently, proposed residential, commercial, and industrial developments must meet requirements set by the Fire Underwriters Survey (FUS)
- However, the fire flows (L/s) under the FUS requirements can exceed pumping capacity of Haldimand County's fire fighting equipment
- The County is considering setting minimum fire flow requirements for new developments based on requirements in the Ontario Building Code and the capabilities of fire fighting equipment.

Property Type (based on typical in County)	FUS Required Fire Flow (L/s)	OBC Minimum Flow Rate (L/s)	City of Ottawa with Cap (L/s)	City of Sudbury Required Fire Flow (L/s)	Haldimand County Maximum Flow (L/s)	Recommended Minimum Flow Requirement (L/s)
Low Density	100	30	100	75	160	80
High Density	250	150	167	75		80
Commercial	100	30	100	150		150
Industrial	150	150	150	150		150

PROPOSED WASTEWATER SERVICING



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

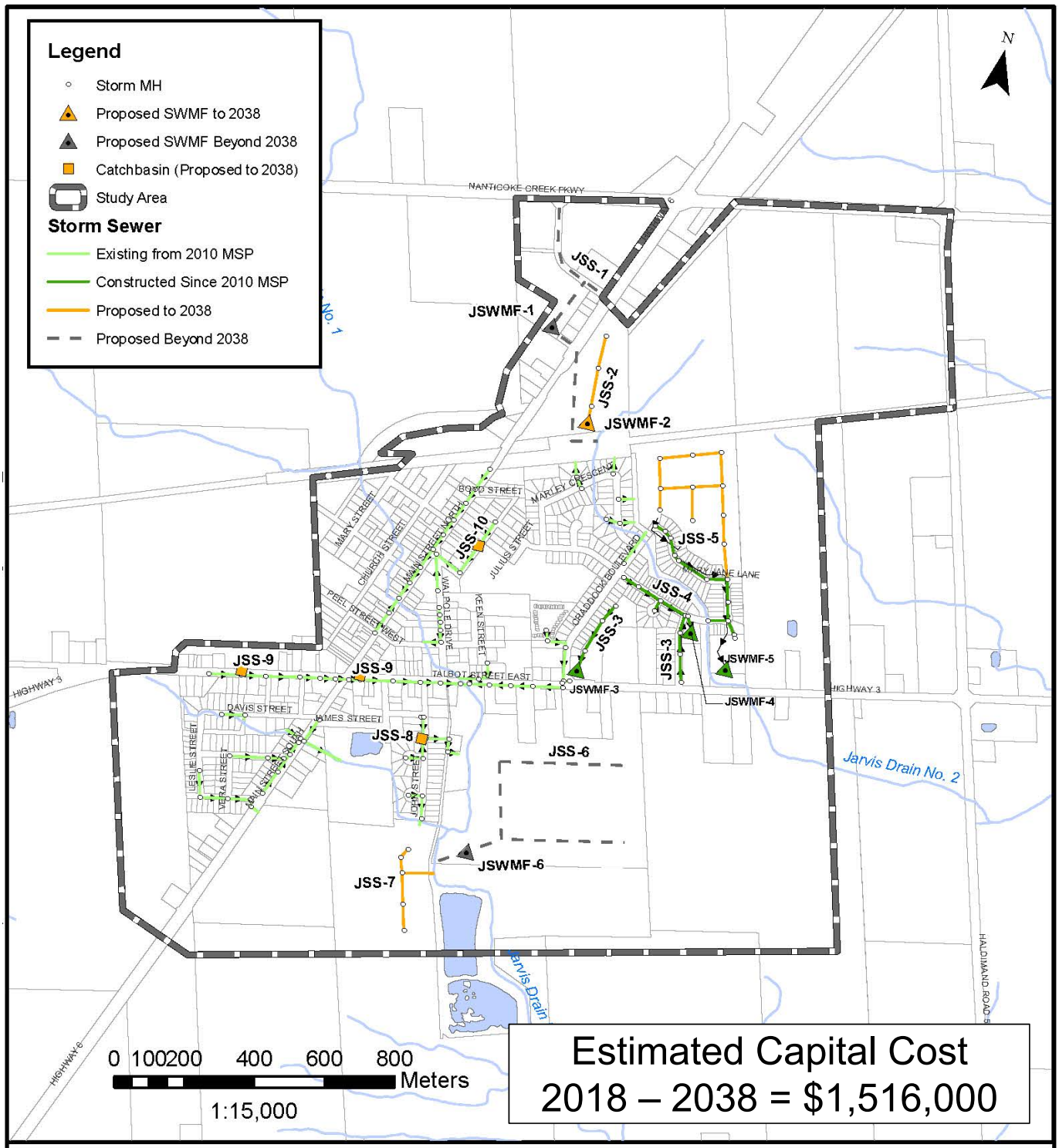
DRAWING:

FUTURE (2038) WASTEWATER COLLECTION SYSTEM

HALDIMAND COUNTY

J.L.Richards ENGINEERS · PLANNERS

PROPOSED STORMWATER SERVICING



Estimated Capital Cost
2018 – 2038 = $1,516,000

PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE
JARVIS, HALDIMAND COUNTY, ONTARIO

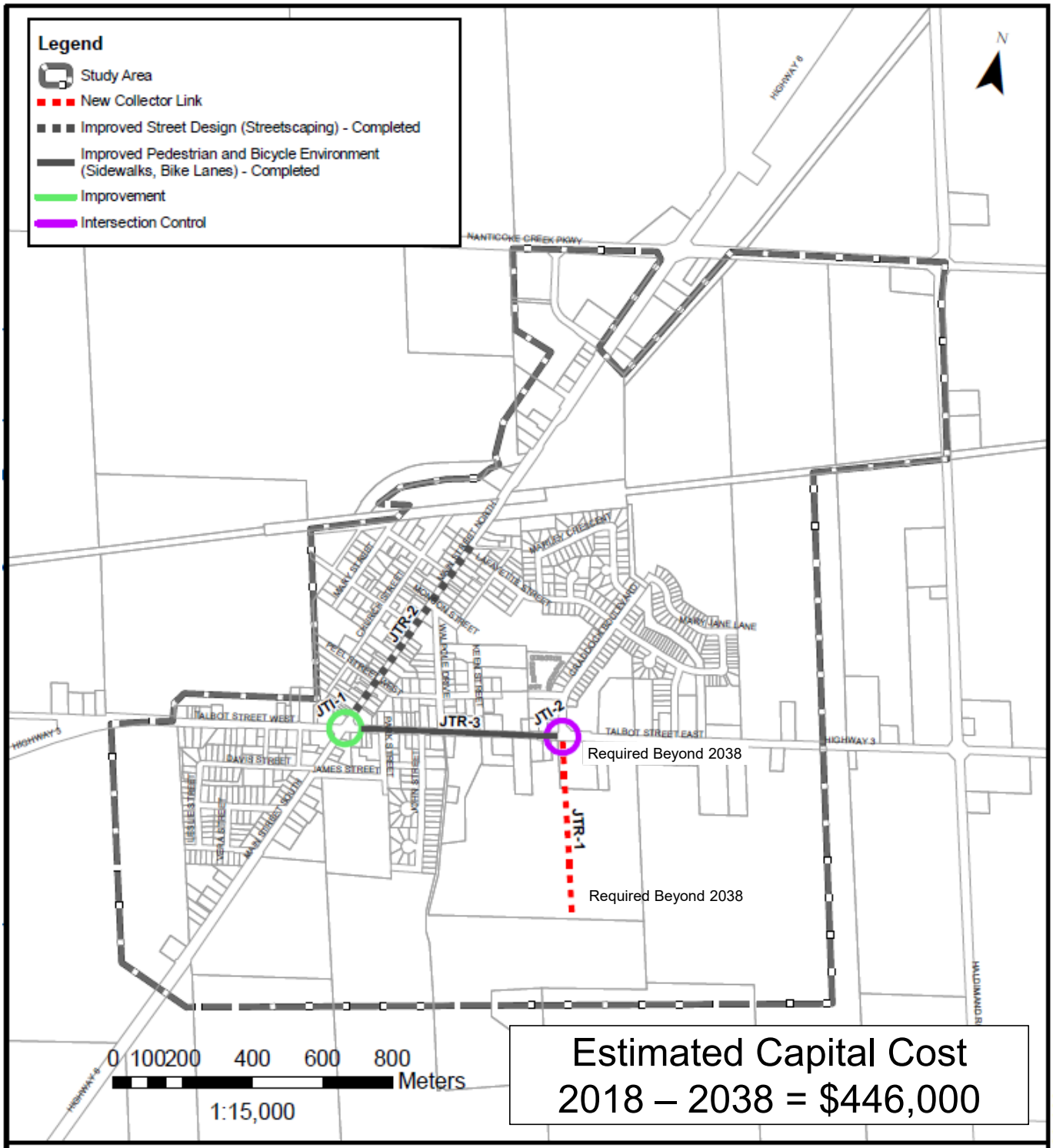
DRAWING:

FUTURE (2038) STORMWATER DRAINAGE SYSTEM

HALDIMAND COUNTY

J.L.Richards ENGINEERS · PLANNERS

PROPOSED TRANSPORTATION SERVICING



PROJECT:

JARVIS MASTER SERVICING PLAN UPDATE

JARVIS, HALDIMAND COUNTY, ONTARIO

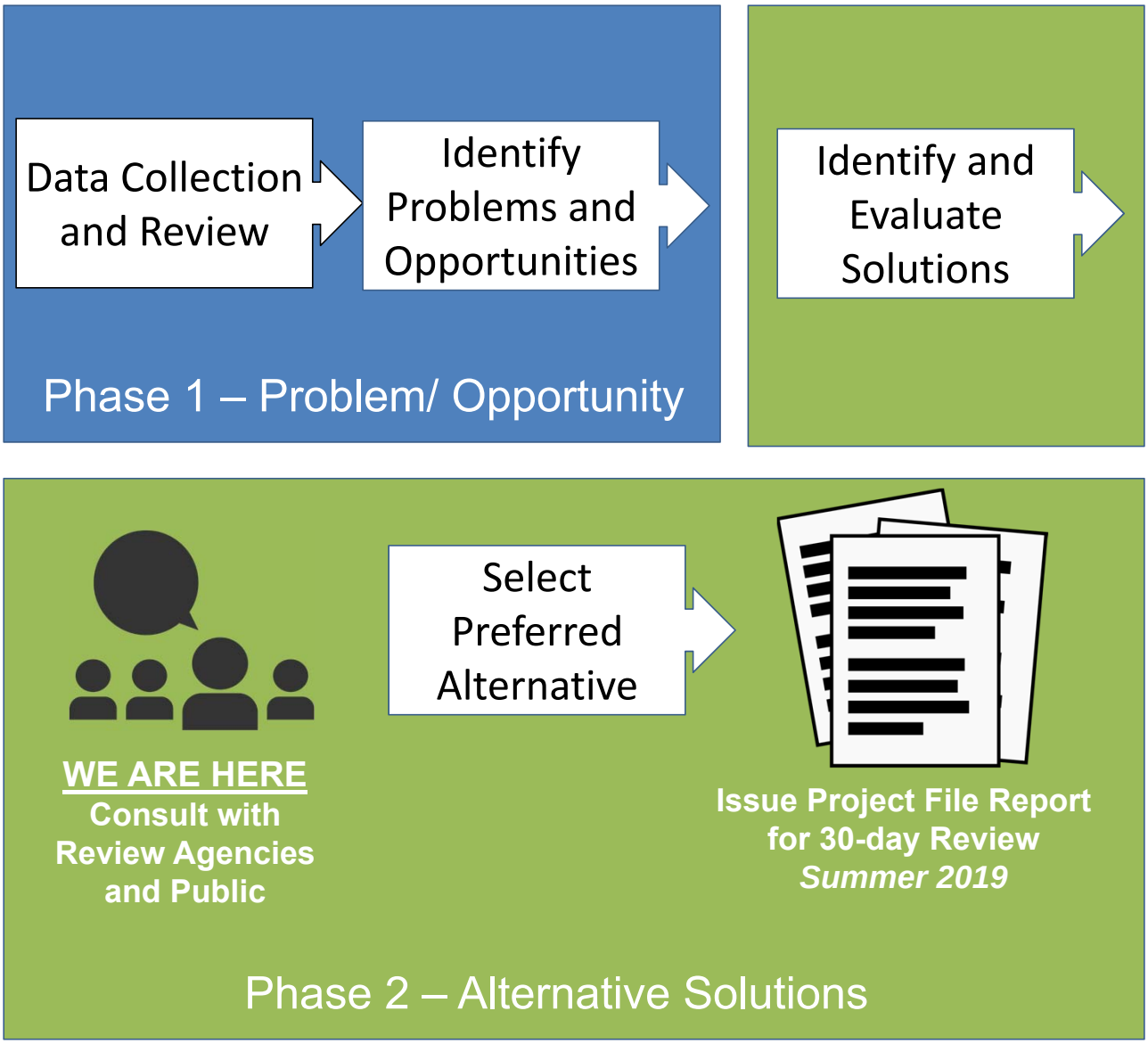
DRAWING:

TRANSPORTATION IMPROVEMENTS

HALDIMAND COUNTY

J.L.Richards ENGINEERS · PLANNERS

NEXT STEPS



1. The draft Project File report on the Class EA is to be presented to Council this summer.
2. Upon completion of the Class EA a formal 'Notice of Completion' will be issued by the County. The public and review agencies will have 30 days to request a 'Part II Order' from the MECP.
3. If no request for a 'Part II Order' is received, the Phase 1 and 2 of the Class EA will be complete. The County will be in a position to consider Project Implementation (Phase 5) and proceed directly into preliminary design.

Haldimand County
Jarvis Master Servicing Plan Update

J.L.Richards
ENGINEERS · PLANNERS

COMMENT FORM

Name (please print): _____ Date: _____

I represent a(n): ☐ Resident ☐ Agency ☐Public Interest Group ☐Other Stakeholder

Do you wish to receive updates in regards to this project? ☐ Yes ☐ No _____ (please specify)

Contact Information (Optional)

Agency (if applicable): _____

Address (number, street and apt. no.): _____

City, Province, Postal Code: _____

Phone: _____ Email: _____

Please indicate any issue(s) that need to be explored/investigated as part of this Master Plan:

Please provide any additional comments about this Master Plan:

Please place any additional comments on the reverse of the form. Completed forms can be returned to the County Office or emailed to jwilson@jlrichards.ca.

Jane Wilson, P.Eng
Environmental Engineer
J.L. Richards & Associates Limited
107-450 Speedvale Ave W, Guelph ON, N1H 7Y6
Phone: 519-763-0713

Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

Appendix F

Correspondence

Ministry of Tourism, Culture and Sport

Heritage Program Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416.314.7643

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416. 314.7643

Ontario

03 April 2019 EMAIL ONLY

Michael Troop, P.Eng.
J.L. Richards & Associates Limited
107-450 Speedvale Ave W
Guelph, ON N1H 7Y6
mtroop@jlrichards.ca

MTCS File	**:**	**0010467**
Your File	**:**	**28176**
Proponent	**:**	**Haldimand County**
Subject	**:**	**Notice of Commencement -Municipal Class Environmental Assessment**
Project	**:**	**Jarvis Master Servicing Plan Update**
Location	**:**	**Community of Jarvis, Haldimand County**

Dear Mr. Troop:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for your project. MTCS's interest in this Master Plan project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources (including land and marine)
- built heritage resources (including bridges and monuments)
- cultural heritage landscapes

Under the Municipal Class Environmental Assessment (EA) process, the proponent is required to determine a project's potential impact on cultural heritage resources. A Master Plan project at minimum will address Phases 1 and 2 of the Municipal Class EA process. Developing and reviewing inventories of known and potential cultural heritage resources within the study area can identify specific resources that may play a significant role in guiding the evaluation of alternatives for subsequent project-driven EAs.

Project Summary
Haldimand County is proposing a study to update the 2010 Master Servicing Plan for the Community of Jarvis. This study will consider the four servicing components of water, wastewater, stormwater and transportation in order to address updated land use and growth forecasts as well as guide future infrastructure projects in the community.

This study is proceeding as a Schedule B project (Approach #2), under the Municipal Class environmental assessment process.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
Your Master Plan project may impact archaeological resources and you should screen the project with the MTCS *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* to determine if archaeological assessments will be needed for subsequent project-driven Municipal Class EAs. MTCS archaeological sites data are available at *archaeology@ontario.ca*, and if your Master Plan project area exhibits archaeological potential or encompasses archaeological sites of high cultural heritage value or interest, these data should be used in the evaluation of alternatives.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether your Master Plan project may impact cultural heritage resources. The clerk for Haldimand County can provide information on property registered or designated under the *Ontario Heritage Act* and municipal Heritage Planners can also provide information that will assist you in completing the checklist. A determination of whether the Master Plan project area impacts potential or known heritage resources of cultural heritage value or interest should be used in the evaluation of alternatives.

If subsequent project-driven Municipal Class EAs may impact potential or known heritage resources MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MTCS for review and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into Master Plan projects. Please advise MTCS whether any technical heritage studies will be completed for your Master Plan project, and provide them to MTCS before issuing a Notice of Completion. If your screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the Master Plan report or file.

Thank you for consulting MTCS on this project. Please continue to do so through the Master Plan process, and contact me for any questions or clarification.

Sincerely,

Katherine Kirzati
Heritage Planner
katherine.kirzati@ontario.ca

c: Peter Minkiewicz, Haldimand County

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MTCS makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MTCS be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MTCS if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately and the local police as well as the Registrar, Burials of the Ministry of Government and Consumer Services (416-326-8800) must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

vallee

Consulting Engineers, Architects & Planners

April 3, 2019

J.L. Richards & Associates Limited
107-450 Speedvale Ave W
Guelph, ON N1H 7Y6

Attention Michael Troop
Manager, Senior Environmental Engineer

Reference: Jarvis Master Servicing Plan Update
Municipal Class Environmental Assessment

G. Douglas Vallee Limited is in receipt of a Notice of Commencement for the Jarvis Master Servicing Plan Update. We have clients in Jarvis who may be impacted by the results of the Class EA. The notice does not identify when and where the Public Open House will be held. Accordingly, it requested that G. Douglas Vallee Limited be provided written notice describing when a date, time and location for the Public Open House has been confirmed as our attendance is anticipated. After learning of the details of the assessment at the Public Open House, we would potentially provide comments to you for consideration. Thank you.

Yours truly,

Eldon Darbyson, Director of Planning
G. DOUGLAS VALLEE LIMITED
Consulting Engineers, Architects & Planners

H:\Projects\2008\08-016 Gusenbauer Condo Jarvis\CORRESPONDENCE\April 2019 - Jarvis Class EA\Letter to Consultant Requesting Notice of Public Open House April 3, 2019.docx

c. Peter Miniewicz, Haldimand County

RECEIVED
AVR APR 5 2019
J.L. Richards & Associates Limited
GUELPH OFFICE

Ministry of the Environment, Conservation and Parks
Drinking Water and Environmental Compliance Division
West Central Region

119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement de la Protection de la nature et des Parcs
Division de la conformité en matière d'eau potable et d'environnement
Direction régionale du Centre-Ouest

119 rue King Ouest
12e étage
Hamilton (Ontario) L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Ontario

April 5, 2019

Mr. Michael Troop
J.L. Richards & Associates Ltd.

Mr. Peter Minkiewicz
Haldimand County

Dear Messrs. Troop and Minkiewicz:

Re: Jarvis Master Servicing Plan Update
Haldimand County
MEA Class EA Master Plan
Response to Notice of Commencement

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that Haldimand County has indicated that it has commenced a master planning process in accordance with the MEA Class EA in order to identify the range of projects that will address the servicing and transportation needs for the Town of Jarvis.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal Peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project:

COMMUNITY	CONTACT
Six Nations of the Grand River Territory 1695 Chiefswood Road P.O. Box 5000 Ohsweken, ON N0A 1M0	Chief Ava Hill Tel: (519)445-2201 or avahill@sixnations.ca Email: arleenma@sixnations.ca and Lonny Bomberry, Lands and Resources Director at lonnybomberry@sixnations.ca
Haudenosaunee Confederacy Chiefs Council 2634 6th Line Road R.R. #2 Ohsweken, ON N0A 1M0	Hohahes Leroy Hill, Secretary jocko@sixnations.ca
Mississaugas of the New Credit 2789 Mississauga Road RR #6 Hagersville, ON N0A 1H0	Fawn Sault Consultation Manager Email: Fawn.Sault@newcreditfirstnation.com

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link: https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process
Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Approvals and Permissions Branch under the following circumstances subsequent to initial discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director of the Environmental Assessment and Permissions Branch can be notified either by email with the subject line "Potential Duty to Consult" by mail, email or fax at the addresses provided below:

Email:	enviropermissions@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Approvals and Permissions Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play in them.

As of July 1st 2018, a standardized form is to be used by anyone who believes that the environmental assessment process was incomplete, incorrect in that it failed to follow the required process. The required form can be found on the Forms Repository website (http://www.forms.ssb.gov.on.ca/) by searching "Part II Order" or "012-2206E (the form ID number). Once completed, the form is then to be sent to both the Minister and Director of the Environmental Assessment and Permissions Branch. Their addresses are:

Minister
Ministry of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto, ON M7A 2J3
Minister.mecp@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. West, 1st Floor
Toronto, ON M4V 1P5
enviropermissions@ontario.ca

As of May 1, 2018, proponents are requested to send all Notices and completed project information form to the region where the project is located. If your project is located in more than one ministry region, you need to submit your notices to all appropriate regions. This is in addition to the existing notification requirements in each class environmental assessments and streamlined environmental assessment process.

To submit your Notice you need to do the following:

1. download and complete the project information form
2. the subject line of your email must include the project location, type of streamlined environmental assessment and project name
3. attach a copy of your project notice in PDF format and your completed project information form in Excel format to the email
4. send your email to the appropriate ministry regional office:
    - Central Region – eanotification.cregion@ontario.ca
    - Eastern Region – eanotification.eregion@ontario.ca
    - Northern Region – eanotification.nregion@ontario.ca
    - South West Region – eanotification.swregion@ontario.ca
    - West Central Region – eanotification.wcregion@ontario.ca

Should you have any questions or require clarification, please contact me either at (905) 521-7864 or at Barbara.slattery@ontario.ca

With best regards,

Barbara Slattery

EA/Planning Coordinator

Encl.

From: Peter Minkiewicz
To: Jane Wilson
Subject: FW: 28176 Jarvis MSP Update NOPIC_R0 (002)
Date: June 5, 2019 3:32:12 PM

Jane

FYI

From: Fawn Sault [mailto:Fawn.Sault@mncfn.ca]
Sent: Thursday, May 30, 2019 3:35 PM
To: Peter Minkiewicz <pminkiewicz@haldimandcounty.on.ca>
Subject: RE: 28176 Jarvis MSP Update NOPIC_R0 (002)

Good Morning Peter,

Thank you for the notice. It would be nice to set up a meeting with Haldimand to discuss what our expectations are regarding consultation. I think it would help Haldimand understand too what types of projects/impacts we are interested in and at what stages. We can then set up to meet twice a year just to go over what projects Haldimand has a year or two ahead of time so we are not just reacting to things. That is the goal anyhow.

Let me know if you are interested. I am currently booking into July.

Miigwetch,

Fawn D. Sault
Consultation Manager
Department of Consultation and Accommodation
Mississaugas of the Credit First Nation
4065 Hwy 6 North
Hagersville, On.
N0A 1H0
Office - 905-768-4260
Cell – 289-527-6580
http://www.mncfn.ca
Facebook: Mississauga of the Credit First Nation

From: Peter Minkiewicz [mailto:pminkiewicz@haldimandcounty.on.ca]
Sent: Tuesday, May 28, 2019 4:17 PM
To: Fawn Sault; 'pgeneral@sixnations.ca'
Subject: 28176 Jarvis MSP Update NOPIC_R0 (002)

Hello Paul and Fawn

Attached above is copies of the public notice for the Jarvis MSP update PIC.

The Master Servicing Plan update is required to ensure the master servicing plan is up to date and contemplates growth in the short and long term planning horizon.

As has been our practice if there is a desire for us to come and overview these projects further we would be pleased to do so as staff.

Please let me know if there might be a preferred time and we can make arrangements for the meeting.

Thanks

Peter Minkiewicz
Supervisor, Development Services
Planning & Development

Haldimand County
Hagersville Satellite Office

Tel: 905-318-5932 x6208
Fax: 905-768-7328
www.HaldimandCounty.ca

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June 7, 2019

Prepared for:

HALDIMAND COUNTY
Hagersville Satellite Office
1 Main Street South
Hagersville, ON N0A 1H0

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED
107-450 Speedvale Ave West
Guelph, ON N1H 7Y6
Tel. 519-763-0713
Fax: 519-763-9261

Project File Report

Municipal Class EA for Additional Wastewater Treatment Capacity for Jarvis

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through service and commitment

Table of Contents

1.0 INTRODUCTION 1
1.1 Project Overview 1
1.2 Class Environmental Assessment 1
1.3 Problem Statement 1
2.0 PUBLIC AND AGENCY CONSULTATION 3
2.1 Notice of Study Commencement and Public Information Centre (PIC) 3
2.2 Public Information Centre 3
2.3 Review Agency Consultation 3
2.4 Public Stakeholder Comments 3
3.0 EXISTING CONDITIONS 4
3.1 Wastewater Treatment System Description 4
3.2 Pumping Station 7
4.0 HISTORICAL DATA ANALYSIS 8
4.1 Wastewater Flow Update 8
4.2 Influent Quality 9
4.3 Treated Effluent Quality 12
4.4 Treatment Capacity 15
4.5 Receiving Water Body 15
4.6 Existing Wastewater Treatment Constraints 17
5.0 FUTURE CONDITIONS 17
5.1 Equivalent Population 17
5.2 Design Future Flow 18
5.3 Wastewater Collection System Design Future Flow 18
5.4 Design Influent Quality 19
5.5 Proposed Effluent Criteria 20
5.6 Treatment Capacity Assessment 20
5.7 Lagoon Seasonal Capacity Assessment 21
5.8 Future Wastewater Treatment Constraints 22
6.0 EVALUATION AND SELECTION METHOD 23
6.1 Evaluation and Selection Overview 23
6.2 Capital Costs Methodology 23

7.0 IDENTIFICATION OF WASTEWATER TREATMENT ALTERNATIVES 24
7.1 Initial Screening of Alternatives 24
7.2 Shortlisted Alternatives for Detailed Evaluation 25
7.3 Description of Shortlisted Alternatives 25
7.4 Detailed Evaluation of Wastewater Treatment Alternatives 33
8.0 PREFERRED SOLUTION 34
8.1 Description of the Preferred Alternative 34
8.2 Opinion of Probable Cost for Preferred Solution 36
9.0 MITIGATION MEASURES 37
9.1 Impacts to Natural Environment 37
9.2 Archeological and Cultural Heritage 37
9.3 Impact during Construction 37
10.0 REVIEW OF CLASS EA SCHEDULE NEXT STEPS 37
11.0 CONCLUSION 38
12.0 REFERENCES 39

List of Figures

Figure 1 Jarvis Class EA Study Area Boundary 2
Figure 2 Alternative 7 – Add Enhanced Treatment System 26
Figure 3 Alternative 8 – Add a New Lagoon Cell 28
Figure 4 Alternative 9 – Pump Surplus Sewage to Townsend Lagoon 30
Figure 5 Alternative 11 – Build a Mechanical Treatment Plant 32
Figure 6 Preferred Alternative Proposed Site Plan 35

List of Tables

Table 1 Summary of Public Stakeholder Comments 3
Table 2 Jarvis Lagoon Volume ECA No. 9261-AKJL76 4
Table 3 Jarvis Lagoon Volume - Jarvis Capacity Assessment Data (2011) 5
Table 4 Jarvis Lagoon Volume - Topographic Volumetric Survey of Jarvis Sewage Lagoons Data (2018) 5
Table 5 Effluent Objectives (ECA No. 9261-AKJL76) 6
Table 6 Effluent Limits (ECA No. 9261-AKJL76) 6
Table 7 Historical Average Raw Sewage Flows (2013 – 2017) 8
Table 8 Historical Maximum Day Raw Sewage Flows (2013 – 2017) 9
Table 9 Summary of Wastewater Influent Quality Parameters Concentration Data 10

Table 10 Summary of Wastewater Influent Quality Parameters Loading Data..... 11
Table 11 Summary of Spring Effluent Water Quality Parameters 13
Table 12 Summary of Fall Effluent Water Quality Parameters 13
Table 13 BOD5 Loading and Detention Time for Jarvis Lagoon 15
Table 14 Summary of Field and Water Quality Parameters for Sandusk Creek..... 16
Table 15 Summary of Future Equivalent Population for Jarvis..... 18
Table 16 Future Wastewater Treatment System Flow 18
Table 17 Summary of Modelled Wastewater Flow (Future) 19
Table 18 Influent Design Concentration and Loading 19
Table 19 Proposed Effluent Quality Objective..... 20
Table 20 Proposed Effluent Quality Limit 20
Table 21 BOD5 Loading and Detention Time for Jarvis Lagoon 21
Table 22 Spring Seasonal Storage Capacity..... 21
Table 23 Fall Seasonal Storage Capacity 22
Table 24 Description and Preliminary Evaluation of Alternatives 24
Table 25 Total Estimated Cost of Alternative 7 (2018$)..... 27
Table 26 Total Estimated Cost of Alternative 8 (2018$)..... 29
Table 27 Total Estimated Cost of Alternative 9 (2018$)..... 31
Table 28 Evaluation Impact Level 33
Table 29 Summary Evaluation Matrix..... 33
Table 30 Opinion of Probable Cost for Preferred Alternative 36

List of Appendices

Appendix A – Notice of Study Commencement and Public Information Centre

Appendix B – Public Information Centre Display Boards

Appendix C – Public and Agency Comments

Appendix D – Lagoon Seasonal Storage Capacity

Appendix E – Detailed Alternatives Evaluation Matrix

1.0 INTRODUCTION

1.1 Project Overview

The community of Jarvis is located approximately 15 kilometres north of Lake Erie in the western part of Haldimand County (the County). The community has approximately 2,000 residents (Watson, 2018) and development there is predominantly residential. Industrial, commercial, and institutional (ICI) development is concentrated in the north side of the community along Highway 6.

Currently, all wastewater in Jarvis is conveyed to the Jarvis lagoons for treatment (ECA No. 9261-AKJL76). The County is conducting a Class EA to determine the preferred alternative to increase wastewater treatment capacity for Jarvis. The study area for the Class EA encompasses the urban boundary of Jarvis, Figure 1 illustrates the study area boundary.

1.2 Class Environmental Assessment

The Ontario Environmental Assessment Act (Act) sets out a planning and decision-making process to consider potential environmental effects before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. In 1987, the first Class EA document prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011 and 2015.

This study was initiated as a Schedule C Class Environmental Assessment, for additional wastewater treatment capacity at the Jarvis Wastewater Treatment Lagoons. Projects categorized as Schedule B or Schedule C undertakings have the potential for significant environmental impacts and are required to follow specific phases under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project and the preparation of a Class EA Project File or Environmental Study Report that documents the Class EA process.

1.3 Problem Statement

The Jarvis Lagoon is currently operating near its treatment capacity. The purpose of this Municipal Class Environmental Assessment is to determine the preferred wastewater treatment alternative to meet anticipated growth in Jarvis.

PROJECT:

JARVIS CLASS EA

JARVIS, ONTARIO

DRAWING:

JARVIS CLASS EA STUDY AREA

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DESIGN:	LP
DRAWN:	KTK
CHECKED:	JW
JLR #:	28176

DRAWING #:

FIGURE 1

File Location: P:\28000\28176-000 - Jarvis Master Plan Update\3-Production\1-Civil\2019-06-07 EA_Figures\S28176 StudyArea.mxd

Plot Date: June 7, 2019 12:50:39 PM

2.0 PUBLIC AND AGENCY CONSULTATION

2.1 Notice of Study Commencement and Public Information Centre (PIC)

A Notice of Study Commencement and PIC (provided in Appendix A) was prepared by the consulting team. Contact information was provided for stakeholders to contact with questions regarding the project. The Notice was issued via the following means:

- Placed on the County's website
- Placed in local newspaper twice between March 28 and April 10, 2019
- Mailed to property owners adjacent to the Jarvis and Townsend lagoons
- Submitted through the MECP Streamlined EA process June 4, 2019

2.2 Public Information Centre

The PIC for the Class EA took place on Wednesday April 10, 2019 at the Jarvis Public Library from 4:00 pm to 6:00pm. The Notice was placed on the County's website and placed in the local newspaper. Representatives from the project team and staff from the Municipality were available to answer questions during the PIC. The PIC was attended by approximately 12 members of the public. Comments received from the public at the PIC are summarized in Table 1. Refer to Appendix B for a copy of the display boards.

2.3 Review Agency Consultation

No comments from any review agency have been received to date regarding the Class EA.

2.4 Public Stakeholder Comments

Table 1 below provides a summary of public comments received to date regarding this Class EA. Refer to Appendix C for a summary of Public and Agency comments.

Table 1 Summary of Public Stakeholder Comments

Stakeholder	Comment	Action
Public Commenter 1	April 10, 2019 – Noted that the County should explore the option of sending waste directly to Townsend Lagoons. Recommended County look at complimentary opportunities during the Class EA Wastewater project (ex. Widening Concession and Townline Road).	Per Section 8.1 consideration will be given to pumping directly to the Townsend Lagoons during detailed design.
Public Commenter 2	April 10, 2019 – Concerned about the potential forcemain disturbing new street surfacing. Recommends a route that will create the least disturbance.	Per Section 9.3, where possible it is recommended that direction drilling be employed during construction.

3.0 EXISTING CONDITIONS

3.1 Wastewater Treatment System Description

3.1.1 Lagoon Volume

As shown in Table 2, the lagoon system consists of four (4) waste stabilization lagoons with overall storage capacity of 155,700 m^3. The treatment facility operates under ECA Number 9261-AKJL76, issued by the Ontario MECP May 11, 2017.

Table 2 Jarvis Lagoon Volume ECA No. 9261-AKJL76

Cell	Volume (m^3) (1)
Cell 1	33,686
Cell 2	40,109
Cell 3	29,593
Cell 4	52,312
Total	**155,700**

To facilitate phosphorous removal the cells are dosed prior to spring and fall discharge. The pumped flow to the Lagoons is split between two (2) forcemains which direct flow to either Cell No. 1 and 2 or Cells No. 3 and 4. Under normal operating conditions, Cells No. 3 and 4 are filled first followed by Cells No. 1 and 2. The cells are discharged in the same order in which they are filled. The lagoon operates with two (2) seasonal discharges in the fall and spring. As outlined in the ECA the Spring and Fall Effluent Discharge Periods begin March 15 and November 1 respectively, terminate within 45 days, and discharge is allowed for 30 days (consecutive or not) but no less than 21 days. Discharge is to Jarvis Drain No. 1 (Jarvis Creek) and ultimately Sandusk Creek. Two (2) Palmer Bowlus flumes measure discharge flow, one (1) for each pair of lagoon cells.

In 2011 and 2018, studies were conducted to asses the available storage volume in the lagoons. A technical memorandum was prepared (CPO, 2011) that used a plan sketch of the lagoons and depth measurements provided by Haldimand County Staff to estimate the volume of the lagoon for comparison to previously reported values. Additionally, the lagoons were surveyed via boat and using total station survey equipment to calculate the lagoon storage volume (Upper Canada Consultants, 2018). Table 3 and Table 4 summarize the findings of these two (2) studies.

Table 3 Jarvis Lagoon Volume - Jarvis Capacity Assessment Data (2011)

Component	Surface Area (m^2)	Side Slopes (assumed)	Working Depth (m) (1)	Volume (m^3) (2)
Cell 1	25,427	1:4	1.5	42,901
Cell 2	29,613	1:4	1.5	49,069
Cell 3	23,443	1:4	2.5	60,972
Cell 4	40,925	1:4	2.5	108,180
Total	**199,408**	**-**	**-**	**261,122**

Table 3 Notes:

1. Depth includes freeboard (0.3m) and minimum water depth (0.6m) following discharge.
2. Volume subtracting freeboard (0.3m) and minimum water depth (0.6m).

Table 4 Jarvis Lagoon Volume - Topographic Volumetric Survey of Jarvis Sewage Lagoons Data (2018)

Component	Surface Area (m^2)	Volume (m^3) (1)	Working Volume (m^3) (2)
Cell 1	29,627.79	50,106.78	39,653.78
Cell 2	24,827.85	40,416.56	27,115.56
Cell 3	23,375.21	41,329.72	39,199.72
Cell 4	38,104.77	62,743.18	61,080.18
Total	**115,935.62**	**194,596.24**	**167,049.24**

Table 4 Notes:

1. Volume subtracting freeboard (0.3m).
2. Volume subtracting freeboard (0.3m) and minimum water depth (0.6m).

In both studies, the total volume was greater than the value reported in the ECA. Based on data provided by the Upper Canada Consultants Topographic Volumetric Survey of Jarvis Sewage Lagoons (2018), when the freeboard is accounted for the lagoon volume is approximately 167,0004m^3, or 11,300m^3 greater then the volume reported in the ECA. This measured working volume has been used for analysis purposes.

3.1.2 Certificate of Approval Requirements

The wastewater treatment system is rated for an Average Day Flow (ADF) of 853 m^3/day. The key objective and compliance requirements for the treatment system are outlined in Table 5 and Table 6 below.

Table 5 Effluent Objectives (ECA No. 9261-AKJL76)

Parameter	Concentration in Effluent
Carbonaceous Biochemical Oxygen Demand (CBOD5)	15.0 mg/L
Total Suspended Solids	15.0 mg/L
Total Ammonia Nitrogen	15.0 mg/L
Total Phosphorus	0.5 mg/L
E.coli	200 organisms/100 mL
pH	6.5 – 8.5

Table 6 Effluent Limits (ECA No. 9261-AKJL76)

Parameter	Concentration in Effluent	Waste Loading in Effluent	Non-compliance
CBOD5	25.0 mg/L	21.3 kg/day	• Annual average concentration means the arithmetic mean of all the single sample concentrations of a contaminant in the effluent calculated for any particular calendar year • Annual average loading means the value obtained by multiplying the annual average concentration of a contaminant by the annual average daily flow over the same calendar year
Total Suspended Solids	25.0 mg/L	21.3 kg/day	• Annual average concentration means the arithmetic mean of all the single sample concentrations of a contaminant in the effluent calculated for any particular calendar year • Annual average loading means the value obtained by multiplying the annual average concentration of a contaminant by the annual average daily flow over the same calendar year
Total Ammonia Nitrogen	25.0 mg/L	-	• Single Sample Concentration exceeds concentration • Concentration of a contaminant in the effluent discharged on any day, as measured by a composite or grab sample, whichever is required

Total Phosphorus	0.5 mg/L	0.43 kg/day	• Annual average concentration means the arithmetic mean of all the single sample concentrations of a contaminant in the effluent calculated for any particular calendar year • Annual average loading means the value obtained by multiplying the annual average concentration of a contaminant by the annual average daily flow over the same calendar year
pH	Maintained between 6.0 – 9.5	-	• Maintained always

3.1.3 Land Use and Property Constraints

Jarvis lagoons are located on Parts 4 & 5, Concession VII, Registered Plan R 2904 and approximately 2500 metres south of Talbot Street. A land registry survey was not conducted; however, the adjacent land appears to be privately owned with a woodlot on the west property boundary, and agricultural land on the remaining three (3) sides. In 2015, the County acquired access rights to necessary land accessing the lagoon to install hydro upgrades for the site.

An aspect of land use planning that must be considered is MECP Guideline D-2 “Compatibility between Sewage Treatment and Sensitive land Use”. This Guideline states that the recommended separation distances between property/lot line of sensitive land uses (e.g., residences) and wastewater lagoon vary between 100 to 400 metres depending on the type of pond and characteristics of the waste. Guideline D-2 states that a separation distance of 150 metres is recommended for wastewater treatment plants of capacity between 500 m^3/day and 25,000 m^3/day. This will be considered in subsequent phases of the Class EA.

3.2 Pumping Station

The Jarvis SPS is located south of Talbot Street and to the east of the access road. The station has three (3) submersible pumps each with an approximate pumping capacity of 60 L/s. A pump has been upgraded since the 2010 MSP and the current the firm capacity of the SPS is120 L/s.

4.0 HISTORICAL DATA ANALYSIS

4.1 Wastewater Flow Update

4.1.1 Average Wastewater Flow Rates

Since 2007, raw sewage flow to the lagoon has been measured by a magnetic flow meter. A new replacement magnetic flow meter was installed in April 2017 and in 2009, a Milltronic Multi-Ranger unit was installed to calculate flows based on the level in the pump wet well. In recent years, effluent flow has been measured by two (2) Palmer Bowlus Flumes, one for Cell No. 1 and/or 2 and one for Cell No. 3 and/or 4.

The average annual day flows from each recording device are summarized in Table 7.

Table 7 Historical Average Raw Sewage Flows (2013 – 2017)

Year	Magnetic Flow Meter (m^3/day)	Multi-Ranger Unit (m^3/day)	Palmer Bowlus Flumes (m^3/day) (1)
2013	887	623	739
2014	1295	594	945
2015	697	605	739
2016	691	553	583
2017	985	855	867
Average	911	646	775

Table 7 Notes:

1. Effluent flows measured by the Palmer Bowlus Flumes were adjusted by adding annual precipitation (from the Hamilton International Airport) and subtracting evaporation, estimated at 554 mm/year from CPO, Inc (2011).

In 2018, the Jarvis Lagoons Operation and Capacity Update study was conducted by Haldimand County to assess the capacity of the Jarvis Lagoons for re-rating (Haldimand County, 2018). The study reviewed historical average influent flow measurements and concluded that due to improper equipment installation, the flow measurement devices are unreliable and all the influent flow data is potentially inaccurate. Recent data is reportedly more accurate. As such, the 2017 Magnetic Meter average day flow of 985 m^3/day will be used for treatment system design purposes at the lagoon. Based on meteorological records, this was a relatively wet year and is a realistic but conservative estimate of the average day flow.

4.1.2 Maximum Day Wastewater Flow Rates

The maximum day flows from each recording device are summarized in the Table 8.

Table 8 Historical Maximum Day Raw Sewage Flows (2013 – 2017)

Year	Magnetic Flow Meter (m^3/day)	Multi-Ranger Unit (m^3/day)
2013	5210	1100
2014	5991	1065
2015	5620	9266
2016	4515	1070
2017	5363	2157 (1)
Average	5340	2932

Table 8 Notes:

1. Multi-Ranger Unit in 2017 had an error reading of 11,046 m^3/day as the maximum day raw sewage flow. This entry was excluded and the next highest maximum day raw sewage flow reading of 2157 m^3/day for 2017 was used.

For maximum day flow, the most accurate data is reported to be from the magnetic flow meter. The average maximum day flow is 5,340 m^3/day which will be used for treatment system design purposes at the lagoon.

4.2 Influent Quality

Composite samples from the inlet manhole to the lagoons are analyzed weekly for biochemical oxygen demand (BOD5), total suspended solids, total phosphorous, and total Kjeldahl nitrogen. The influent quality from these sampling events are summarized in Table 9 and Table 10.

Table 9 Summary of Wastewater Influent Quality Parameters Concentration Data

Year	BOD5 (mg/L)	CBOD (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorous (mg/L)	pH	Temperature (Deg C)	Alkalinity (mg/L)	Total Ammonia Nitrogen (mg/L)	Total Kjeldahl Nitrogen (mg/L)
2013	118.7	90.0	163.5	3.7	7.8 (1)	8.5 (2)	267.2	17.4	29.7
2014	118.4	99.6	161.6	4.0	7.4 (3)	20.0 (4)	269.7	16.4	27.7
2015	168.3	116.1 (5)	185.1	4.7	-	-	320.1	22.4	37.2
2016	172.8	-	199.4	7.0	-	-	341.0	22.9	37.5
2017	131.9	-	154.7	7.7	-	-	307.0	17.1	29.3
Average	**142.0**	**101.9**	**172.9**	**5.4**	**7.6**	**14.3**	**301.0**	**19.2**	**32.3**
Typical Wastewater Strength (6)	110 (Low) 190 (Med) 350 (High)	-	120 (Low) 210 (Med) 400 (High)	4 (Low) 7 (Med) 12 (High)	-	-	-	-	20 (Low) 40 (Med) 70 (High)

Table 9 Notes:

All parameters have data from the full sampling dates unless otherwise noted below.

1. pH data from Jan - Apr 2013
2. Temperature data from Jan - Apr 2013
3. pH data from August 2014
4. Temperature data from August 2014
5. CBOD data from Jan - Aug 2015
6. Typical Wastewater Strength - Metcalf and Eddy (2003)

Table 10 Summary of Wastewater Influent Quality Parameters Loading Data

Year	BOD5 Loading (kg/d)	CBOD Loading (kg/d)	Total Suspended Solids Loading (kg/d)	Total Phosphorous Loading (kg/d)	Total Ammonia Loading (kg/d)	Total Kjeldahl Nitrogen Loading (kg/d)
2013	68.4	51.0	95.7	2.1	9.9	17.3
2014	60.8	51.4	86.0	2.1	8.3	14.3
2015	80.9	60.8 (1)	92.5	2.4	10.7	18.2
2016	82.8	-	95.9	3.3	10.9	18.0
2017	60.9 (2)	-	83.7 (3)	4.6 (4)	9.0 (5)	14.9 (6)
Overall	**70.8**	**54.4**	**90.8**	**2.9**	**9.8**	**16.5**

Table 10 Notes:

All parameter have data from the full sampling dates unless otherwise noted below.

1. CBOD Loading data only Jan - Aug 2015
2. BOD5 Loading data only Jan - Apr 2017
3. Total Suspended Solids Loading data only Jan - Apr 2017
4. Phosphorous Loading data only Jan - Apr 2017
5. Ammonia Loading data only Jan - Apr 2017
6. Total Kjeldahl Loading data only Jan - Apr 2017

The results indicate that the concentration of BOD5, total suspended solids, total phosphorous and total Kjeldhal nitrogen in the influent wastewater are in the low to medium range of literature values for typical raw municipal wastewater strength.

4.3 Treated Effluent Quality

Grab samples of the treated effluent from the lagoon are taken on the first and last day of effluent discharge period and every three (3) calendar days during the effluent discharge period. A summary of data for the analyzed parameters are included in Table 11 and Table 12 for spring and fall discharge periods respectively.

Table 11 Summary of Spring Effluent Water Quality Parameters

	CBOD (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorous (mg/L)	pH	Temp (Deg C)	Ammonia (mg/L)	Un-ionized Ammonia (mg/L)	E. coli (cfu/100mL)
Objective	15	15	0.5	-	-	15	-	200
Limit	25	25	0.5	6 - 9.5	-	25	-	-
2013	2.5	5.9	0.1	7.5	11.0	5.6	0.0	5.4
2014	13.7	14.1	0.5	7.7	8.9	6.8	0.1	*324.5*
2015	4.9	4.8	0.1	7.4	11.8	8.5	0.0	177.5
2016	2.3	4.9	0.1	7.5	5.3	8.2	0.0	2.9
2017	4.8	9.1	0.4	7.8	12.3	5.3	0.1	65.5
Overall	**5.6**	**7.7**	**0.2**	**7.6**	**9.8**	**6.9**	**0.1**	**35.7**

Table 12 Summary of Fall Effluent Water Quality Parameters

	CBOD (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorous (mg/L)	pH	Temp (Deg C)	Ammonia (mg/L)	Un-ionized Ammonia (mg/L)	E. coli (cfu/100mL)
Objective	15	15	0.5	-	-	15	-	200
Limit	25	25	0.5	6 - 9.5	-	25	-	-
2013	5.5	8.6	0.2	7.4	10.7	4.9	0.3	*639.6*
2014	4.0	7.9	0.1	7.5	7.5	5.7	0.0	177.9
2015	2.9	5.1	0.1	7.5	8.3	4.5	0.0	43.1
2016	3.2	2.9	0.1	7.3	9.4	9.0	0.0	1.2
2017	3.3	6.4	0.2	7.8	6.4	2.7	0.0	147.0
Overall	**3.8**	**6.2**	**0.1**	**7.5**	**8.4**	**5.4**	**0.1**	**61.6**

The treated effluent quality has been within the ECA compliance requirements in all cases with the exception of E. coli. The E. coli concentration exceeded the objective during both the spring and fall discharge period in 2013. The overall average concentration of E. coli is below the objective, and the concentration has been below the objective in all subsequent years since 2013. There is no compliance objective or limit for un-ionized ammonia, though it is typically below 0.1 mg/L. Overall, effluent quality in both the spring and fall discharge periods has been below the limits.

4.4 Treatment Capacity

The MECP guideline for BOD5 loading is 22 kg/(Ha*day) or less for a facultative lagoon. The BOD5 loading and detention time were calculated for pairs of cells and for all cells cumulatively. Table 13 below shows the BOD loading for cells 1 & 2, 3 & 4 and all cells.

Table 13 BOD5 Loading and Detention Time for Jarvis Lagoon

Average Flow (m^3/day)	Cells Loaded	Total Area (Ha) (1)	Total Volume (m^3) (2)	BOD5 Loading (kg/(Ha*day))	Detention Time (days)
985	1 & 2	5.45	66,769	12.99	68
985	3 & 4	6.15	100,280	11.51	102
985	1, 2, 3 & 4	11.59	167,049	6.11	170

Table 13 Notes:

1. Total Area Data from Topographic Volumetric Survey of Jarvis Sewage Lagoons, 2018.
2. Volume excludes freeboard (0.3m).

Under the existing average day flow, each lagoon pair and overall the entire lagoon adequately meet the 22 kg/(Ha*day) MECP guideline for BOD5 loading. The longest detention time required for the Jarvis Lagoon is approximately 210 days between the spring and fall discharge. Each pair of lagoons respectively and the overall lagoon do not have a detention time to satisfy a maximum 210 day detention time.

Although BOD loading is within acceptable limits, it is important to note that the plant is currently operating at approximately 90% of the ECA rated capacity (refer to Table 7).

4.5 Receiving Water Body

The Jarvis Lagoon discharges to Jarvis Municipal Drain No. 1 (Jarvis Creek) which ultimately leads to Sandusk Creek. Each year a study is conducted by Hutchinson Environmental Sciences Ltd. to summarize water quality in Jarvis Creek and Sandusk Creek during the spring and fall discharge periods to support an application to the MECP to extend the discharge period to provide operational flexibility, and to minimize impact on the receiver. Water quality samples are taken at sampling location of Sandusk Creek downstream of Jarvis Creek inflow generally at Brooklin Road or south of Concession 4. The findings from 2013 to 2017 are summarized in Table 14.

Table 14 Summary of Field and Water Quality Parameters for Sandusk Creek

Field Parameter	Maximum	Minimum	Average	PWQO/ CWQG
Water Temperature (°C)	15.51	3.46	8.01	
Conductivity (µS/cm)	1049	331	573	
Dissolved Oxygen (mg/L)	15.8	8.58	12.03	
Dissolved Oxygen (%)	139.1	81.4	101.2	
pH	8.9	7.24	8.12	6.5-8.5
Water Quality (mg/L)				
Total Suspended Solids (TSS)	418	6.6	75	
Total Phosphorous (TP)	0.602	0.0628	0.244	0.03
Total Ammonia as Nitrogen (TAN)	1.77	0.042	0.421	
Un-ionized Ammonia (UI-TAN)	0.027	0	0.0056	0.0164
Nitrate-N	5.41	1.3	3.17	3
Biological Oxygen Demand (BOD) (1), (4)	2	2	2	
Carbonaceous Oxygen Demand (CBOD) (2), (4)	3	2	2.4	
Sulphide (as H_2S) (3)	<0.0021	<0.0021	<0.0021	0.002
E. coli (CFU/mL) (3)	800	0	51 (5)	100

Table 14 Notes:

All parameters have data from the full sampling dates unless otherwise noted below.

1. Data from October 7, 2013 to November 8, 2013
2. Data from April 06, 2016 to November 28, 2016
3. Data from April 06, 2016 to December 05, 2017
4. Results reported as less than the reported value were rounded to the recorded value for the purpose of calculating averages
5. A zero value was excluded from geometric mean

The purpose of the Provincial Water Quality Objectives (PWQO) is to provide a foundation for the level of water quality to protect aquatic life and recreational water use based on public health and aesthetic considerations in Ontario. PWQO provides guidance for decision making for water quality management decisions, and establishes a basis for setting waste effluent requirements for Certificates of Approval, and other regulatory documents.

Over the years sampled:

- The total phosphorous (TP) concentration consistently exceeded the PWQO limit. The average concentration is approximately eight (8) times greater than the limit. The minimum total phosphorous concentration in the last four (4) years is over double the PWQO concentration limit.

- The un-ionized ammonia concentration has generally remained below the PWQO limit. Most sample concentrations were notably below the limit, with the exception of two (2) consecutive samples that had un-ionized ammonia concentrations exceeding the PWQO limit.
- The average concentration of nitrate has exceeded the Canadian Water Quality Guideline (CWQG) limit. Half of the samples reported concentrations of nitrate exceeding the CWQG limit, while the other half reported concentrations less than the limit. Typically, more recent samples have reported higher nitrate concentrations.
- The average concentration of E. coli has been below the PWQO limit. Although the average E. coli concentration does not exceed the limit, it should be noted four (4) of the five (5) most recent samples have reported E. coli concentrations greater than the limit. Based on two (2) years of data only.

Overall, the concentration of total phosphorous and nitrate water quality parameters exceed the PWQO/CWQG limits. As a result, the receiving water body can be considered Policy II with respect to total phosphorous and nitrate concentrations. Per the PWQO Surface Water Quality Management Guideline, water quality that does not presently meet the PWQO may not be degraded further, and efforts must be taken to upgrade the water quality to meet objectives.

4.6 Existing Wastewater Treatment Constraints

Based on a review of the available background information, the following are the key findings and constraints at the Jarvis lagoons:

- Based on estimates of the average day flow the lagoon system is currently operating at 90% capacity.
- Raw sewage is typical of domestic sewage with monthly samples each year falling in the range of literature values for typically low to medium strength sewage.
- Few concerns related to effluent quality have been identified. The only exceedances of the objectives are related to E.coli. In all years under review, the ECA limits were met.
- There are discrepancies between the ECA lagoon volume and recent survey data; however, based on the surveyed surface area and volume, the lagoons meet the MECP guidelines for BOD loading and retention time.
- The receiving water body is Policy II for phosphorous and nitrogen.

5.0 FUTURE CONDITIONS

5.1 Equivalent Population

In Work Package 2 – Growth Forecast and Assessment of Future Needs (J.L. Richards & Associates Ltd., 2019) for Jarvis Master Servicing Plan Update residential and ICI growth projections were converted equivalent population for analysis purposes.

Anticipated growth in Jarvis is approximately 6.54 ha (120 units) of low density residential land, 1.85 ha (34 units) of medium density residential land, 0.35 ha (24 units) of high density residential land, and 2.91 ha of ICI land to be developed. A summary of future equivalent population is provided in Table 15.

Table 15 Summary of Future Equivalent Population for Jarvis

Year(s)	Equivalent Population
Total 2017 (1)	2560
2018-2038 Residential Growth	510
2018-2038 ICI Growth	262
Total Growth	772
Total Future	3332

Table 15 Notes:

1. From Work Package 1 (J.L. Richards & Associates Ltd., 2019)

5.2 Design Future Flow

5.2.1 Wastewater Treatment System Design Future Flow

Future flow for the wastewater treatment lagoon was determined using equivalent population and a uniform per capita sewage generation rate of 332 m^3/day from the GRCA 2017 Watershed Overview of Wastewater Treatment Plant Performance (Hagan & Anderson, 2018). The average day wastewater flow to be used for treatment system design purposes at the lagoon is 1272 m^3/day. See Table 16 for summary.

Table 16 Future Wastewater Treatment System Flow

	Average Day Flow (m3/day)
Existing	985 (1)
2018-2038 Growth	287
2038	1272

Table 16 Notes:

1. 2017 Magnetic Flow Meter Reading, representative of a wet year
2. Equivalent Population calculated in Work Package 2 – Growth Forecast and Assessment of Future Needs for Jarvis Master Servicing Plan Update (J.L. Richards & Associates Ltd., 2019)
3. Per Capita Sewage Generation Rate from 2017 Wastershed Overview of Wastewater Treatment Plant Performance (GRCA, 2018)

5.3 Wastewater Collection System Design Future Flow

One of the options to be considered in this Class EA is the feasibility of pumping flows from Jarvis to the Townsend Lagoons. As such, future collection system flows were also required.

In Work Package 2 – Growth Forecast and Assessment of Future Needs for Jarvis Master Servicing Plan Update (J.L. Richards & Associates Ltd., 2019) future flow for the wastewater collection system was estimated. The updated average, peaked dry weather, inflow and infiltration, and total peaked wet weather flow are summarized in Table 17.

Table 17 Summary of Modelled Wastewater Flow (Future)

Land Use	Average Day Dry Weather (L/s)	Peaked Dry Weather (L/s)	Inflow and Infiltration (L/s)	Total Peaked Wet Weather Flow (L/s)
Total 2017	8.56	31.3	28.7	60.0
Additional Residential to 2038	1.65	5.81	1.70	7.50
Additional ICI to 2038	0.85	1.93	0.57	2.50
Total 2038 Wastewater Flow	**11.1**	**39.0**	**31.0**	**70.0**

The updated future peaked wet weather wastewater flow rate is estimated to be 70.0 L/s (6,048 m^3/day).

5.4 Design Influent Quality

For preliminary design purposes the historical 5-year influent average concentration for the influent quality parameters have been used as the design concentration. The design influent loadings are calculated based on the future average day flow. Design concentration and loadings are summarized in Table 18.

Table 18 Influent Design Concentration and Loading

Parameter	Design Concentration (mg/L) (1)	Design Loading (kg/day) (2)
BOD5 (mg/L)	142	180.6
CBOD (mg/L)	101.9	129.6
Total Suspended Solids (mg/L)	172.9	219.8
Total Phosphorous (mg/L)	5.4	6.9
Alkalinity (mg/L)	301	382.7
Total Ammonia Nitrogen (mg/L)	19.2	24.4
Total Kjeldahl Nitrogen (mg/L)	32.3	41.1

Table 18 Notes:

1. Influent average concentration for 2013-2017. See Section 4.2 (Historic Influent Concentration)
2. Design loading calculation uses future average day flow 1272 m^3/day

5.5 Proposed Effluent Criteria

The receiving water body is Policy II with respect to phosphorous and nitrogen. For the purpose of alternatives development and evaluation proposed effluent criteria were developed with no increase in loading of any effluent parameter. Proposed effluent objectives and effluent limits summarized in Table 19 and Table 20 respectively.

Table 19 Proposed Effluent Quality Objective

Effluent Parameter	Concentration Objective from ECA (mg/L)	Loading Objective (kg/day) (1)	Proposed Concentration Objective (mg/L) (2)
BOD5 (mg/L)	15	12.8	10.1
Total Suspended Solids (mg/L)	15	12.8	10.1
Total Ammonia Nitrogen (mg/L)	15	12.8	10.1
Total Phosphorous (mg/L)	0.5	0.43	0.34
E. Coli (organism/100 mL)	200	-	

Table 19 Notes

1. Loading objective based on ECA flow of 853 m^3/day
2. Proposed Concentration Objective calculated using average day flow of 1272 m^3/day

Table 20 Proposed Effluent Quality Limit

Effluent Parameter	Concentration Limit from ECA (mg/L)	Loading Limit (kg/day) (1), (2)	Proposed Concentration Limit (mg/L) (3)
BOD5	25	21.3	16.8
Total Suspended Solids	25	21.3	16.8
Total Phosphorous	0.5	0.43	0.34
Total Ammonia Nitrogen	25	21.3	16.8
pH			pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times

Table 20 Notes:

1. Loading values are calculated and are not provided in the ECA
2. Waste Loading based on ECA flow of 853 m^3/day
3. Proposed Concentration Objective calculated using average day flow of 1272 m^3/day

5.6 Treatment Capacity Assessment

The MECP guideline for BOD5 loading is 22 kg/(Ha*day) or less for a facultative lagoon. As the cells at Jarvis Lagoon are operated in pairs BOD5 loading and detention time were generated in their respective lagoon pairings and for all cells cumulatively. Table 21 below shows the BOD loading for cells 1 & 2, 3 & 4, and all cells.

Table 21 BOD5 Loading and Detention Time for Jarvis Lagoon

Average Flow (m3/day)	Cells Loaded	Total Area (Ha) (1)	Total Volume (m3) (2)	BOD Loading (kg/(Ha*day))	Detention Time (days)
1272	1 & 2	5.45	74,187	33.13	58
1272	3 & 4	6.15	85,629	29.36	67
1272	1, 2, 3 & 4	11.59	159,816	15.58	126

Table 21 Notes:

1. Total Area Data from Topographic Volumetric Survey of Jarvis Sewage Lagoons, 2018
2. Volume excludes freeboard (0.3m)

Under the future average day flow, each lagoon pair and overall the entire lagoon does not meet the 22 kg/(Ha*day) MECP guideline for BOD5 loading. The longest detention time required for the Jarvis Lagoon is approximately 210 days between the spring and fall discharge. Each pair of lagoons respectively and the overall lagoon do not have a detention time to satisfy a maximum 210 day detention time.

5.7 Lagoon Seasonal Capacity Assessment

For the purpose of alternatives development and evaluation, the seasonal storage capacity of the lagoon was simulated for spring discharge and fall discharge. Summarized in Table 22 and Table 23 are three discharge scenarios and the associated cumulative volume for the spring and fall discharge periods. The cumulative volume for each scenario was compared to the working volume of the Jarvis Lagoon, calculated in Section 3.1.1. Refer to Appendix D for the full detailed lagoon seasonal capacity assessment tables.

Table 22 Spring Seasonal Storage Capacity

Scenario	Cumulative Volume Required (m3) (1)	Volume Surplus or Deficit (m3)
Scenario 1: 45 Days Discharge Period - March 15 to April 28	**175,062**	-8,013
Scenario 2: 21 Days Discharge Period - March 15 to April 4	**236,983**	-69,934
Scenario 3: 30 Days Discharge Period - April 5 to May 4	**177,405**	-10,356

Table 22 Notes:

1. Exceeds lagoon volume

Table 23 Fall Seasonal Storage Capacity

Scenario	Cumulative Volume Required (m3) (1)	Volume Surplus or Deficit (m3)
Scenario 1: 45 Days Discharge Period - November 1 to December 15	163,689	3,360
Scenario 2: 21 Days Discharge Period - November 1 to November 21	**197,208**	-30,159
Scenario 3: 30 Days Discharge Period - November 1 to November 30	**226,485**	-59,436

Table 23 Notes:

1. Exceeds lagoon volume

With the exception of fall scenario one (1), the cumulative volume of discharge for each spring and fall discharge scenario exceeds the available lagoon volume of 167,000 m^3.

5.8 Future Wastewater Treatment Constraints

Based on a review of the future conditions, the following are the key findings and future constraints at the Jarvis lagoons:

- Based on future estimates of the average day flow with no additional treatment capacity the lagoon system would be operating at approximately 50% over capacity.
- Under the future average day flow, the lagoon does not meet the MECP guideline for BOD5 loading and retention time.
- The cumulative volume of discharge for both the spring and fall discharge period exceeds the available lagoon volume.

Option to address these issues are identified in Section 6.0.

6.0 EVALUATION AND SELECTION METHOD

6.1 Evaluation and Selection Overview

The main objective of Phase 2 of a Class EA is to identify and evaluate possible alternatives to the problems and/or opportunities identified in Phase 1. All reasonable potential alternatives to the problem(s), including the 'Do Nothing' alternative, are considered. Class EAs for wastewater projects generally result in the identification and review of a broad range of alternatives. It is also important to note that the objective of Phase 2 is to focus on determining a general solution to the problem and that design details are typically further defined during a preliminary and detailed design stage.

In order to facilitate the evaluation and selection of the preferred alternative during Phase 2, a transparent and logical three (3) part assessment process was established. This process included:

- Initial screening of alternatives;
- Detailed evaluation of screened alternatives; and
- Selection of a preferred alternative.

The first evaluation stage considers the overall feasibility of the potential alternatives and identifies those alternatives that fully address the problem statement. This step ensures that unrealistic alternatives are not carried forward to a more detailed evaluation stage. Based on the initial screening, a detailed assessment of the short list of alternatives was conducted. Evaluation criteria were developed based on a review of the background information, experience on similar assessments and in consultation with County staff. The evaluation was conducted using criterion in the following major criteria categories:

- Natural Environment
- Social and Cultural Environment
- Technical Environment
- Economic Environment

Once the detailed evaluation was completed, a recommended preferred alternative was identified for presentation to stakeholders to solicit input prior to finalizing a preferred alternative.

6.2 Capital Costs Methodology

An Opinion of Probable Construction Costs (OPCC) with a Class 'D' Indicative Estimate level of accuracy was developed for each of the alternatives and includes allowances for design elements that have not fully been developed. The OPCC's were developed based on past experience on similar projects, professional judgement, and equipment costs provided by suppliers.

7.0 IDENTIFICATION OF WASTEWATER TREATMENT ALTERNATIVES

7.1 Initial Screening of Alternatives

Several alternatives to increase the wastewater treatment capacity in Jarvis are presented below in Table 24. A review of each alternative, along with a recommendation to either carry the alternative forward for further evaluation or not, is also provided.

Table 24 Description and Preliminary Evaluation of Alternatives

Alternative	Review/Recommendation
Alternative 1: Do Nothing.	**Review:** This option will not address the problem statement. **Recommendation:** Do not carry forward.
Alternative 2: Implement water conservation measures and I&I reduction program.	**Review:** This option has the potential to reduce flow to the lagoon, though it will not address the problem statement on its own. **Recommendation:** Carry forward in combination with other options.
Alternative 3: Optimize operations within the current discharge volume and periods.	**Review:** Capacity is limited by allowable influent volume and discharge windows. Optimizing operations will not address the issue on its own. **Recommendation:** Carry forward in combination with other options.
Alternative 4: Increase rated capacity of the lagoon without additional storage or treatment; no change in discharge periods.	**Review:** While some additional capacity can be realized through this alternative, the capacity increase possible is less than the 20-year design flows. **Recommendation:** Do not carry forward.
Alternative 5: Increase rated capacity of the lagoon and add post aeration cell with alum feed; extend the spring discharge (start March 1).	**Review:** At design flows there would be sufficient volume in the lagoon to store accumulated wastewater and precipitation during the winter storage period. The storage deficit during the summer storage period would remain. **Recommendation:** Do not carry forward.
Alternative 6: Increase rated capacity of the lagoon; extend the fall discharge (start October 15).	**Review:** At design flows there would be sufficient volume in the lagoon to store accumulated wastewater and precipitation during the summer storage period. The storage deficit during the winter storage period would remain. **Recommendation:** Do not carry forward.
Alternative 7: Increase rated capacity of the lagoon, enhance treatment, and change to continuous discharge periods.	**Review:** This alternative has higher capital and operating costs compared to other options, however, lagoon capacity could potentially be increased. The receiver is sensitive (Policy II) and there may be limited capacity for it to accept discharge in the summer months and accommodate flows beyond 20 years. **Recommendation:** Carry forward.

Alternative	Review/Recommendation
Alternative 8: Increase rated capacity of the lagoon, acquire land to add a new lagoon cell; no change in discharge period.	**Review:** A new cell would be constructed to meet 20-year demands. The revised capacity would be ultimately limited by the allowable discharge volumes in the spring/fall. This option has moderate capital and operating costs. **Recommendation:** Carry forward.
Alternative 9: Treat sewage at Jarvis lagoon (no change in rated capacity) and pump the surplus to the Townsend lagoons for treatment.	**Review:** Higher cost operation compared to other options, however, no charge to the rated capacity or discharge periods at the Jarvis lagoon is required. Could be scaled up to accommodate flows beyond 20-years. **Recommendation:** Carry forward.
Alternative 10: Decommission the Jarvis lagoons and pump all sewage to the Townsend lagoons for treatment.	**Review:** Operation costs may be high due to long distance pumping. The Jarvis lagoon is performing well, so there is no technical driver to decommission it. This option could be considered as part of Alternative 9. **Recommendation:** Do not carry forward.
Alternative 11: Decommission the Jarvis lagoons and build a mechanical treatment plant at the same site or new site.	**Review:** This option has the ability to meet the stringent effluent criteria that would be required for an increase in discharge volume. The costs are anticipated to be higher than other options. **Recommendation:** Carry forward.

7.2 Shortlisted Alternatives for Detailed Evaluation

From the initial screening as detailed in Section 7.1, the following alternatives are being carried forward for the wastewater treatment capacity in Jarvis:

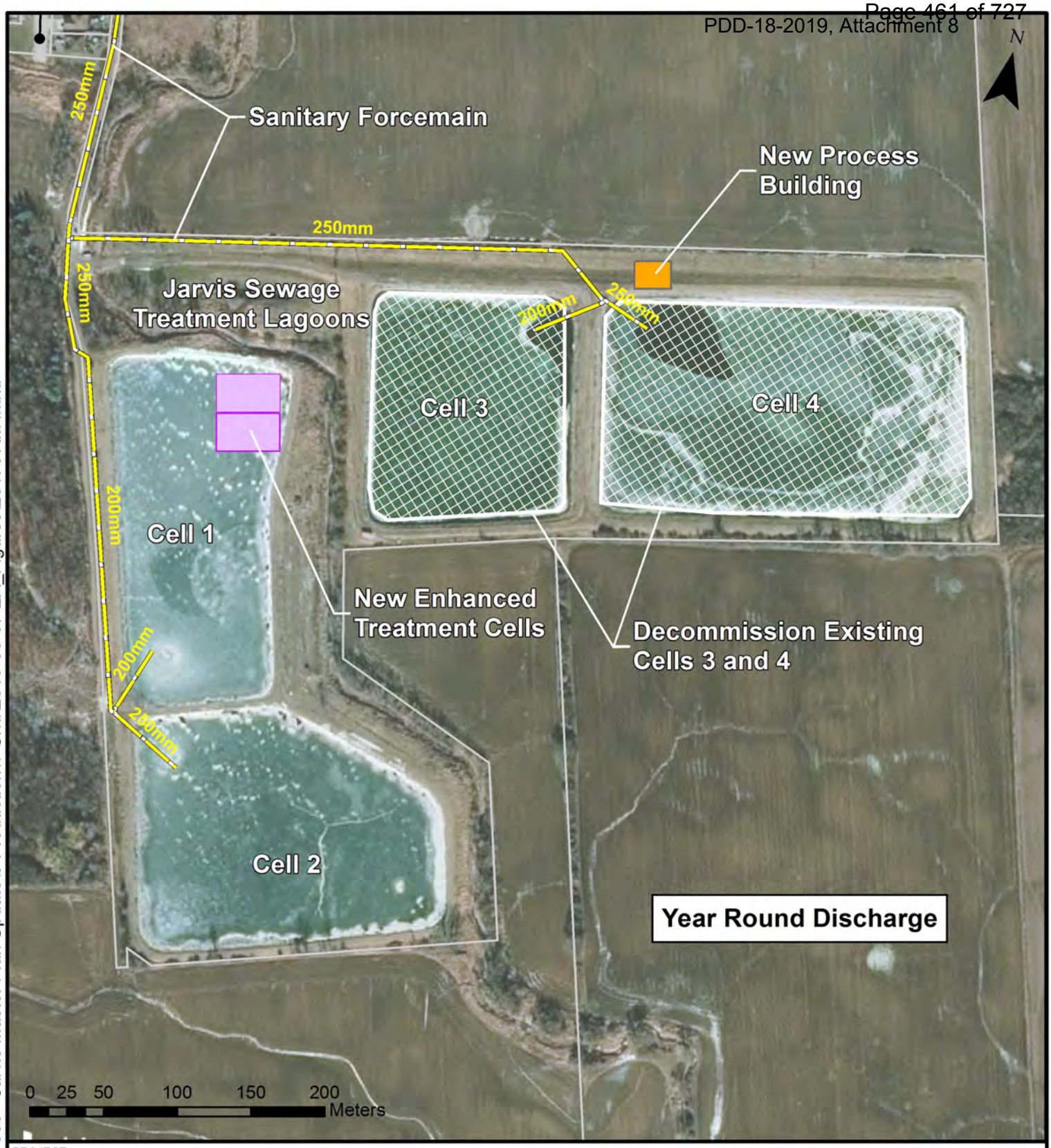
- **Alternative 7:** Increase rated capacity of the lagoon, enhance treatment and change to continuous discharge periods.
- **Alternative 8:** Increase rated capacity of the lagoon, acquire land to add a new lagoon cell and make no changes to discharge periods.
- **Alternative 9:** Treat sewage at Jarvis lagoon (no change in rated capacity) and pump the surplus sewage to the Townsend lagoons for treatment.
- **Alternative 11:** Decommission the Jarvis lagoons and build a mechanical treatment plant at the same site or new site.

Further details are provided for the shortlisted alternatives in Section 7.3 below.

7.3 Description of Shortlisted Alternatives

7.3.1 Alternative 7 – Add Enhanced Treatment System

Alternative 7 involves increasing the rated capacity of the lagoon and changing to continuous or extended discharge periods. The treatment system would be expanded, to include new enhanced treatment cells, a new filter for TSS removal, and a continuous alum feed system. Other works include a mechanical/chemical building, and associated yard pipes and valves. This alternative would require adjacent land acquisition. Refer to Figure 2 for the proposed site plan for Alternative 7. The capital cost estimate for Alternative 7 is provided below in Table 25.



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JARVIS CLASS EA

JARVIS, ONTARIO

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ALTERNATIVE 7 – ADD ENHANCED TREATMENT SYSTEM PROPOSED SITE PLAN

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FIGURE 2

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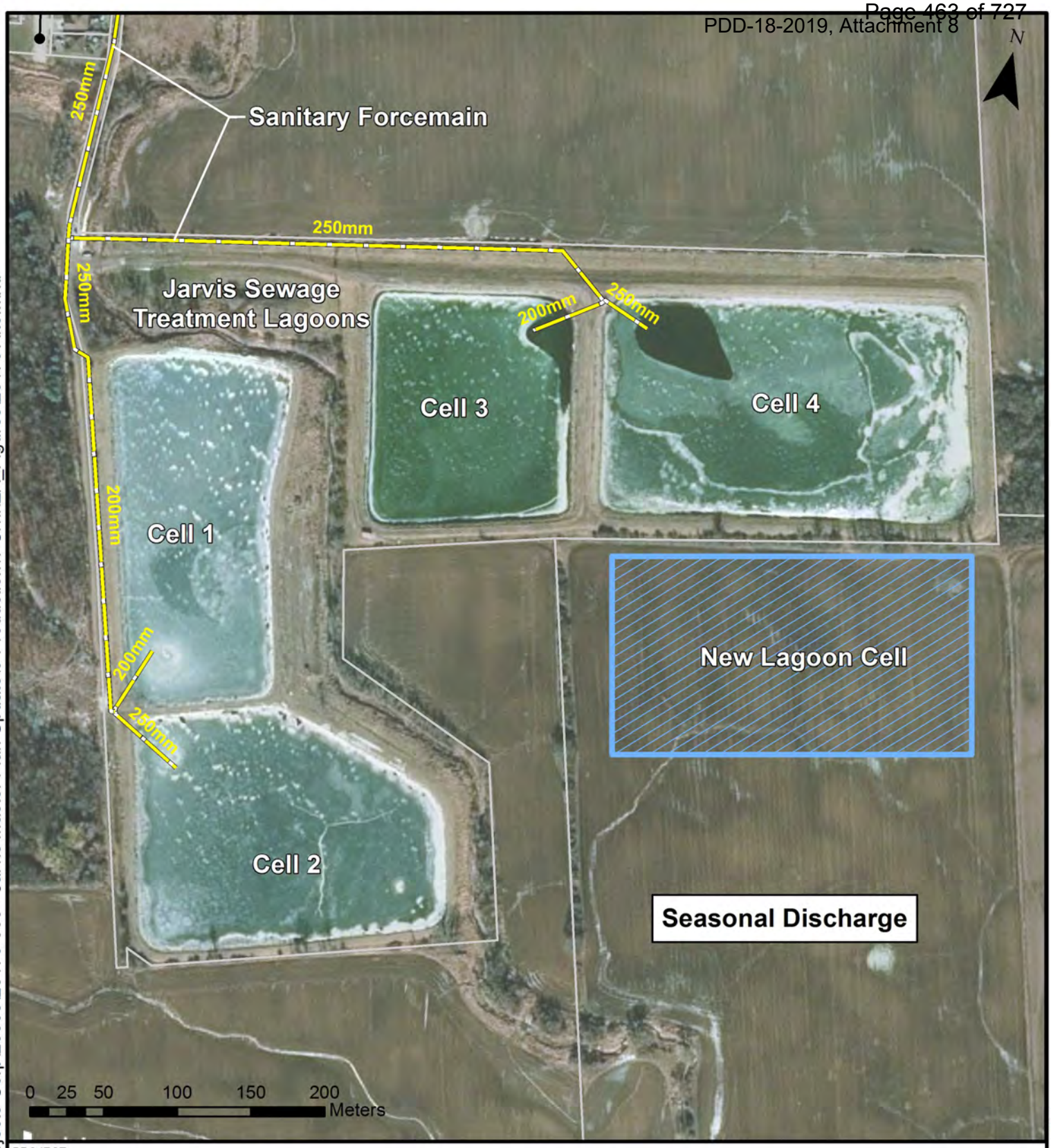
Table 25 Total Estimated Cost of Alternative 7 (2018$)

Discipline	Estimated Capital Cost (2018$)
Civil Works and Associated Infrastructure	$1,130,000
Building	$70,000
Mechanical (Process)	$2,255,000
Mechanical (Building)	$5,000
Electrical	$58,000
Instrumentation and Controls	$5,000
Land Acquisition	$40,000
Subtotal	$3,563,000
Contractor Mobilization/Demobilization (3%)	$106,890
Contingencies (30%)	$1,100,967
Engineering (12%)	$427,560
Total (Rounded)	**$5,200,000**

7.3.2 Alternative 8 – Add a New Lagoon Cell

Alternative 8 involves increasing the rated capacity of the lagoon and acquiring land to add a new 70,000 m^3 lagoon cell. Other works include associated yard pipes and valves. This alternative would require adjacent land acquisition. Refer to Figure 3 for the proposed site plan for Alternative 8. The capital cost estimate for Alternative 8 is provided below in Table 26.



PROJECT:

JARVIS CLASS EA

JARVIS, ONTARIO

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ALTERNATIVE 8 – ADD A NEW LAGOON CELL PROPOSED SITE PLAN

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FIGURE 3

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Table 26 Total Estimated Cost of Alternative 8 (2018$)

Discipline	Estimated Capital Cost (2018$)
Civil Works and Associated Infrastructure	$4,980,000
Land Acquisition	$70,000
Subtotal	$5,050,000
Contractor Mobilization/Demobilization (3%)	$151,500
Contingencies (30%)	$1,560,450
Engineering (12%)	$606,000
Total (Rounded)	**$7,400,000**

7.3.3 Alternative 9 – Pump Surplus Sewage to Townsend Lagoon

Alternative 9 involves making no changes to the rated capacity at the Jarvis lagoon, and pumping excess wastewater to the Townsend lagoon. A 3.4 km forcemain would be built to connect the Jarvis lagoon and Townsend Sewage Pumping Station. The three (3) existing pumps at the Jarvis Sewage Pumping Station are to be replaced. Other works include modifications to the yard piping at the Jarvis Sewage Pumping Station. Refer to Figure 4 for the proposed site plan for Alternative 9. The capital cost estimate for Alternative 9 is provided below in Table 27.

PROJECT:

JARVIS CLASS EA

JARVIS, ONTARIO

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ALTERNATIVE 9 – PUMP SURPLUS SEWAGE TO TOWNSEND LAGOON PROPOSED SITE PLAN

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FIGURE 4

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Table 27 Total Estimated Cost of Alternative 9 (2018$)

Discipline	Estimated Capital Cost (2018$)
Civil Works and Associated Infrastructure	$3,400,000
Mechanical (Process)	$300,000
Subtotal	$3,700,000
Contractor Mobilization/Demobilization (3%)	$111,000
Contingencies (30%)	$1,143,300
Engineering (12%)	$444,000
Total (Rounded)	**$5,400,000**

7.3.4 Alternative 11 – Build a Mechanical Treatment Plant

Alternative 11 involves decommissioning the Jarvis lagoons and constructing a new mechanical treatment plant at the same site or new site. This alternative would require land acquisition. The total capital cost of this alternative has been estimated at $10,000,000. Refer to Figure 5 for the proposed site plan for Alternative 11.

PROJECT:

JARVIS CLASS EA

JARVIS, ONTARIO

DRAWING:

ALTERNATIVE 11 – BUILD A MECHANICAL TREATMENT PLANT PROPOSED SITE PLAN

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FIGURE 5

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7.4 Detailed Evaluation of Wastewater Treatment Alternatives

The following tables summarizes the detailed evaluation of the screened alternatives. Each alternative was assigned an evaluation impact level (refer to Table 28) for each of the four (4) evaluation criteria. This method provides an overall assessment of the positive and negative impacts of each alternative. Table 29 provides a summary evaluation matrix of the evaluation. For the full detailed evaluation matrix, refer to Appendix E.

Table 28 Evaluation Impact Level

Evaluation Impact Level	Indicator
Very Positive	⮝⮝
Positive	⮝
Neutral	●
Negative	⮟
Very Negative	⮟⮟

Table 29 Summary Evaluation Matrix

Criteria	Alternative 7	Alternative 8	Alternative 9	Alternative 11
	Rating	Rating	Rating	Rating
Natural Environment				
Groundwater	●	●	●	●
Fish, Aquatic Life, Vegetation	⮝⮝	⮟⮟	●	⮝⮝
Terrestrial Vegetation & Wildlife	●	●	●	●
Soils and Geology	●	●	●	●
Social and Cultural Environment				
Community Development	⮝⮝	⮟⮟	⮝⮝	⮝⮝
Public Health	●	●	●	●
Noise	●	●	●	●
Aesthetics	●	●	●	●
Air Quality and Odours	⮟	⮟	●	⮟
Archaeological and Heritage Resources	●	●	●	●
Technical Environment				
Constructability and Construction Schedule	⮟	⮟	⮟	⮟⮟
Phasing and Expandability	⮝	●	⮝⮝	⮝
Operational Control	⮝	⮟⮟	⮝	⮝⮝

Criteria	Alternative 7	Alternative 8	Alternative 9	Alternative 11
	Rating	Rating	Rating	Rating
Operational Complexity	⮟	⮝⮝	●	⮟⮟
System Redundancy and Resiliency	⮝	●	⮝⮝	⮝⮝
Utilizes Existing Infrastructure	⮝	⮝	⮝⮝	⮟⮟
Economic Environment				
Capital Costs	$5,200,000	$7,400,000	$5,400,000	$10,000,000
Operational Costs (per year)	$130,000	$30,000	$34,500	$250,000
20-Year Lifecycle Costing	$7,800,000	$8,000,000	$6,100,000	$15,000,000
Overall Rating	⮝	⮟	⮝⮝	●

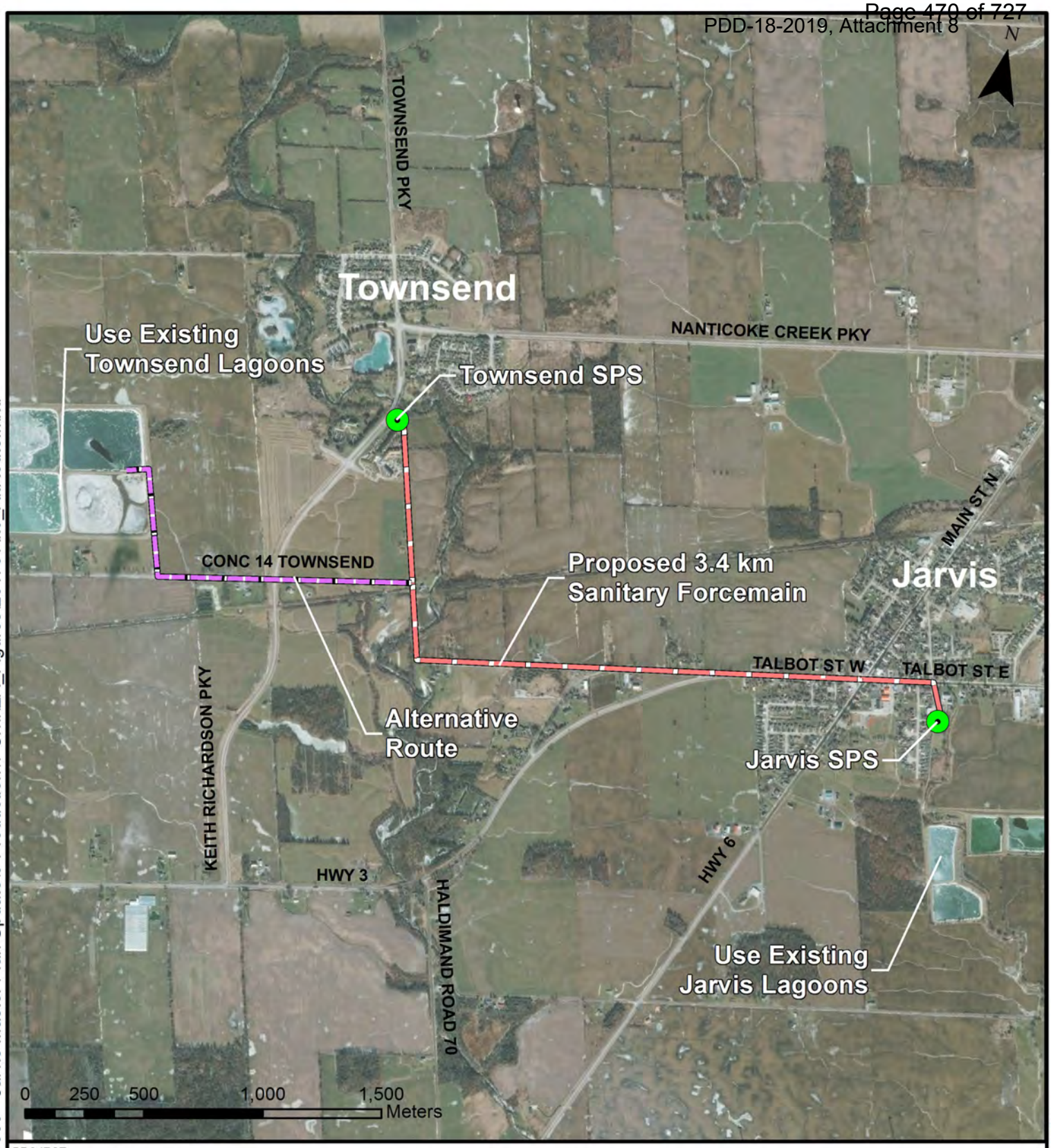
8.0 PREFERRED SOLUTION

8.1 Description of the Preferred Alternative

Based on the evaluation methodology utilized, it was determined that the preferred alternative is to send excess sewage to the Townsend lagoons via a 3.4 km forcemain connecting the Jarvis lagoons and Townsend Sewage Pumping Station (Alternative 9). Consideration could also be given to pumping directly to the Townsend Lagoons (shown as “alternate route” on Figure 6). The three (3) existing pumps at the Jarvis Sewage Pumping Station are also to be replaced with larger pumps. Refer to Figure 6 for the proposed site plan for the preferred alternative.

The main benefits of this alternative include:

- The Townsend lagoons will have sufficient surplus capacity to service long-term growth in Jarvis.
- Lagoon based systems are simple and cost effective to operate compared to other alternatives.
- Enables the County to utilize existing treatment infrastructure in Jarvis and Townsend.
- Moderate capital cost relative to other considered alternatives.



PROJECT:

JARVIS CLASS EA

JARVIS, ONTARIO

DRAWING:

PREFERRED ALTERNATIVE PROPOSED SITE PLAN

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FIGURE 6

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8.2 Opinion of Probable Cost for Preferred Solution

An Opinion of Probable Construction Costs (OPCC) with a Class 'D' Indicative Estimate level of accuracy was developed for full implementation of all elements of the preferred solution. Allowances for design elements that have not been fully developed are included. The OPCC's were developed based on past experience on similar projects, professional judgement, and equipment costs provided by supplier. The OPCC for the preferred alternative is provided below in Table 30.

Table 30 Opinion of Probable Cost for Preferred Alternative

Discipline	Estimated Capital Cost (2018$)
Civil Works and Associated Infrastructure - Construct a new 3.4 km 250mm forcemain - Supply and installation of isolation valve near Jarvis Sewage Pumping Station	$3,400,000
Mechanical (Process) - Supply and installation of three new pumps in the Jarvis Sewage Pumping Station	$300,000
Subtotal	$3,700,000
Contractor Mobilization/Demobilization (3%)	$111,000
Contingencies (30%)	$1,143,300
Engineering (12%)	$444,000
Total (Rounded)	**$5,400,000**

9.0 MITIGATION MEASURES

9.1 Impacts to Natural Environment

Construction of the forcemain will occur over a relatively long distance through agricultural and natural areas and has the potential to disrupt vegetation and wildlife. Potential impacts to the identified natural features in the study area must be assessed during the detailed design and planning phase. Best management practices and standard mitigation should be applied throughout construction to reduce or eliminate potential project effects. A number of mitigation measures are also available if it is not possible to avoid sensitive features, and fish and wildlife habitat (e.g. timing of work in water, erosion control measures, tree protection measures, restoration planting, etc.).

9.2 Archeological and Cultural Heritage

It is recommended to screen the proposed forcemain route for archaeological and cultural heritage significance prior to construction. Should a full archaeological assessment (Stage 1 or Stage 2) of a Cultural Heritage Assessment Report be required it should be conducted by a licenced professional in that field prior to implementation of the preferred alternative.

9.3 Impact during Construction

Temporary impacts and disruption to properties during construction is a concern during implementation of the preferred alternative. To mitigate disruptions, the public and owners of adjacent properties should be consulted regarding construction scheduling and notified in advance of planned disruptions. To minimize the impact during construction consideration should be given to directional drilling along Talbot Street.

10.0 REVIEW OF CLASS EA SCHEDULE NEXT STEPS

The proposed alternations at Jarvis Sewage Pump Station and the construction of the forcemain are classified as Schedule A+ wastewater management projects as outlined in Appendix 1 – Project Schedules for Schedule A+ - Pre-Approved Activities (MEA, 2015).

Establish, extend, or enlarge a sewage collection system and all necessary works to connect the system to an existing sewage or natural drainage outlet, provided all such facilities are in either an existing road allowance or an existing utility corridor, including the use of Trenchless Technology for water crossings.

Increase pumping station capacity by adding or replacing equipment and appurtenances, where new equipment is located in an existing building or structure and where its existing rated capacity is exceeded.

Schedule A+ projects are pre-approved; however, the public must be advised prior to implementation. Per the requirements for Schedule A+ projects, the public will be notified prior to implementation.

11.0 CONCLUSION

This Work Package has been prepared for the exclusive use of Haldimand County, for the stated purpose. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Haldimand County and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:	Reviewed by
Jane Wilson, P.Eng. Environmental Engineer	Michael Troop, P.Eng. Senior Environmental Engineer

12.0 REFERENCES

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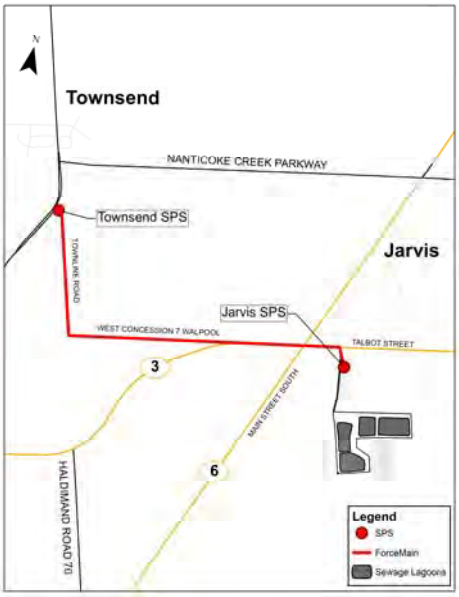
Appendix A

Notice of Study Commencement and Public Information Centre

Notice of Commencement and Public Information Centre

Jarvis Schedule C Municipal Class Environmental Assessment for Additional Wastewater Treatment Capacity

Haldimand County has initiated a Municipal Class Environmental Assessment (Class EA) to determine the preferred wastewater treatment alternative to meet anticipated growth in Jarvis.



How Will This Affect Me?

Wastewater in Jarvis is currently conveyed to the Jarvis wastewater treatment lagoons which are owned and operated by the County. Based on current estimates of the average wastewater flows the lagoon system is currently operating near its capacity. To address this issue, this study has evaluated the community's 20-year wastewater treatment infrastructure needs and has identified a preferred wastewater treatment solution.

The preliminary preferred alternative identifed by this study is to construct a new forcemain to pump surplus wastewater from Jarivs to the larger Townsend lagoons for treatment.

How Do I Get More Information?

A mailing list for notification of study status and opportunities for public input is being compiled. If you wish to add your contact information to the study mailing list, or if you have any questions regarding the study, please contact one of the people listed below.

An Public Open House is being held to gather input from stakeholders to review the future upgrades that are being considered as part of this proposed project. All those interested in the project are invited to attend the Public Open House on:

Date: **Wednesday, April 10, 2019**
Time: **4:00 – 6:00 pm**
Location: **Jarvis Library**
Address: **2 Monson St., Jarvis, ON**

Project information will also be available to the public at the municipal office and on the County's website. If you have any questions regarding the study please contact one of the people listed below. We welcome your feedback.

Michael Troop, P.Eng.	Phil Wilson
Manager, Senior Environmental Engineer J.L. Richards & Associates Limited 107-450 Speedvale Ave W Guelph, ON N1H 7Y6 Phone: 519-763-0713 ext. 6522	Manager, Water & Wastewater Engineering Haldimand County, Caledonia Satellite Office 282 Argyle St. S Caledonia, ON N3W 1K7 Phone: 905-318-5932 Ext. 6431

This study is being conducted according to the requirements of Phases 1 to 4 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act. This notice originally issued March 19, 2019.

Appendix B

Public Information Centre Display Boards

Welcome

to the Public Information Centre
for the

Haldimand County
Jarvis Municipal Class Environmental Assessment for Additional Wastewater Treatment Capacity

We want to hear from you.

Please fill out the comment sheet from today's Public Information Centre and leave it in one of the boxes provided.

Additional information is available on the County's website at www.haldimandcounty.ca and at the Municipal Office.

HALDIMAND COUNTY

J.L.Richards ENGINEERS · PLANNERS

THE MUNICIPAL CLASS EA PROCESS

Data Collection and Review → Identify Problems and Opportunities → Identify and Evaluate Solutions

Phase 1 – Problem/ Opportunity

WE ARE HERE
Consult with Review Agencies and Public

Select Preferred Alternative →

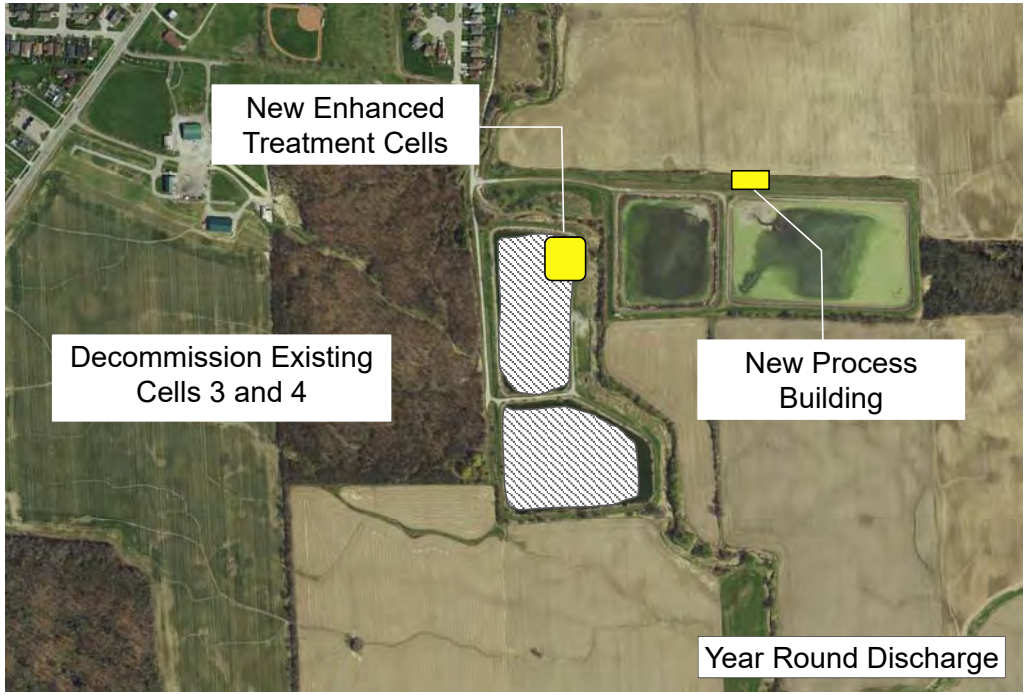
Issue Project File Report (if required) for 30-day Review
Summer 2019

Phase 2 – Alternative Solutions

The Jarvis Lagoon is currently operating near its treatment capacity. The purpose of this Municipal Class Environmental Assessment (Class EA) is to determine the preferred wastewater treatment alternative to meet anticipated growth in Jarvis.

OVERVIEW OF ALTERNATIVES 1 & 2

Alternative 1 – Add Enhanced Treatment System



System Components:

- Two new treatment tanks
- New process building
- Capacity Increase: 420 m^3/day
- Lifecycle Cost: $7,800,000 ($2.55 per m^3)
- Rating: Positive

Advantages/ Disadvantages:

- Very good effluent quality
- Capacity to expand
- Complex to operate
- Relatively high capital costs

Alternative 2 – Add a New Lagoon Cell

System Components:

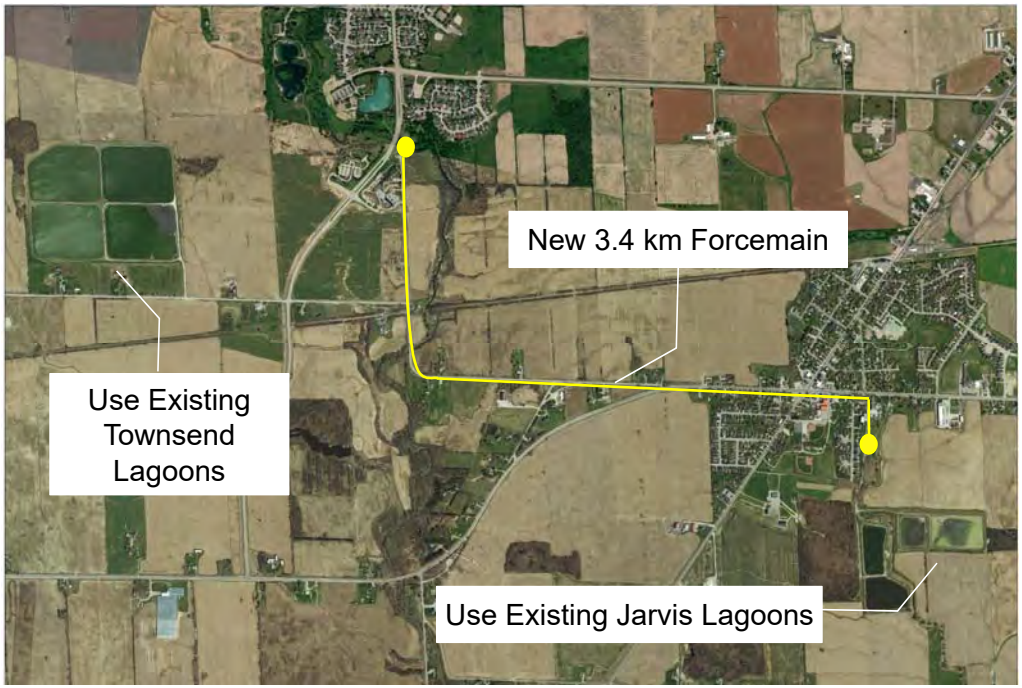
- New 70,000 m^3 lagoon cell
- Capacity Increase: 420 m^3/day
- Lifecycle Cost: $8,000,000 ($2.61 per m^3)
- Rating: Negative

Advantages/ Disadvantages:

- May not meet ammonia limits
- Limited capacity to expand
- Simple to operate
- Relatively high capital costs

OVERVIEW OF ALTERNATIVES 3 & 4

Alternative 3 – Pump Sewage to Townsend Lagoon



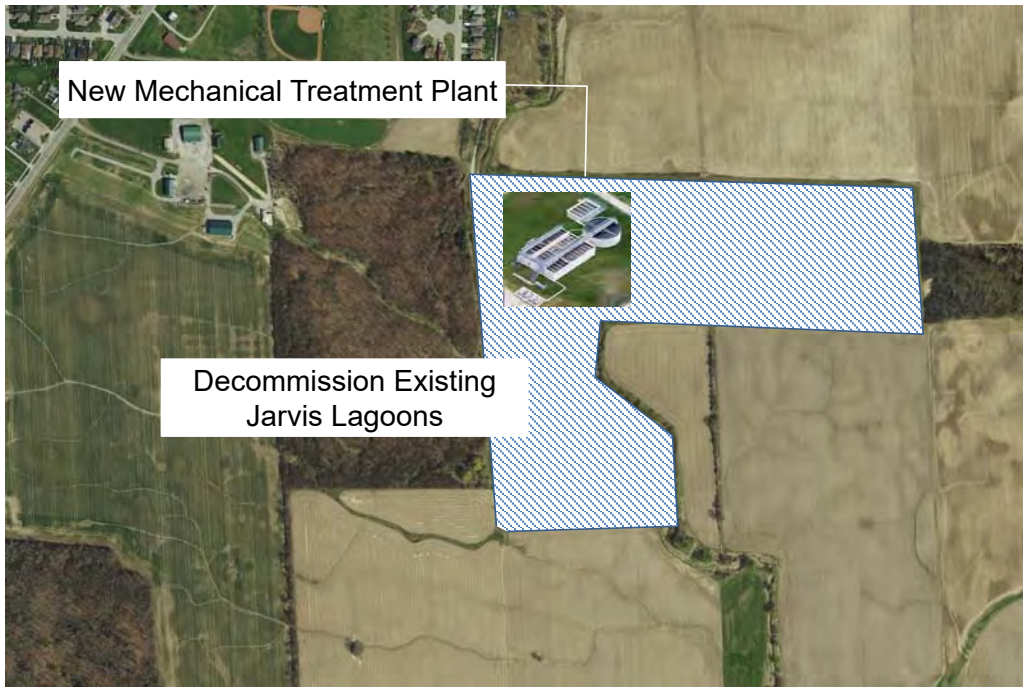
System Components:

- Existing lagoons
- 3.4 km forcemain
- New pumps at Jarvis SPS
- Capacity Increase: 420 – 745 m^3/day
- Lifecycle Cost: $6,100,000 ($1.12-$1.99 per m^3)
- Rating: Very Positive

Advantages/ Disadvantages:

- Uses existing lagoons
- Capacity to expand
- Operational flexibility
- Moderate capital costs
- Low operational costs

Alternative 4 – Build a Mechanical Treatment Plant



System Components:

- New treatment plant
- Decommission lagoon
- Capacity Increase: 420 m^3/day
- Lifecycle Cost: $15,000,000 ($4.90 per m^3)
- Rating: Neutral

Advantages/ Disadvantages:

- Very good effluent quality
- Capacity to expand
- Complex to operate
- High capital costs
- High operating costs

SELECTION OF ALTERNATIVES

Step 1 – Screening and Evaluation: Criteria were used to rate each potential alternative.

Natural Environment

- Effect on Fish, Aquatic Life, Vegetation
- Effect on Groundwater, Soils, Geology
- Effect on Terrestrial Vegetation and Wildlife

Social and Cultural Environment

- Opportunity for Community Development
- Impact on Public Health
- Air Quality, Odours, Noise and Aesthetic Issues
- Archaeological and Heritage Resources

Technical Environment

- Constructability and Construction Schedule
- Opportunities for Phased Implementation and Expandability
- Operational Control and Complexity
- System Redundancy and Resiliency
- Optimized Use of Existing Infrastructure

Economic Environment

- Capital Costing
- Operating Costs
- Lifecycle Costs

Impact Score	Score
Very Positive	⮝⮝
Positive	⮝
Neutral	●
Negative	⮟
Very Negative	⮟⮟

Step 2 – Selection of Preferred Alternative: The highest scoring alternative was selected as the preferred alternative.

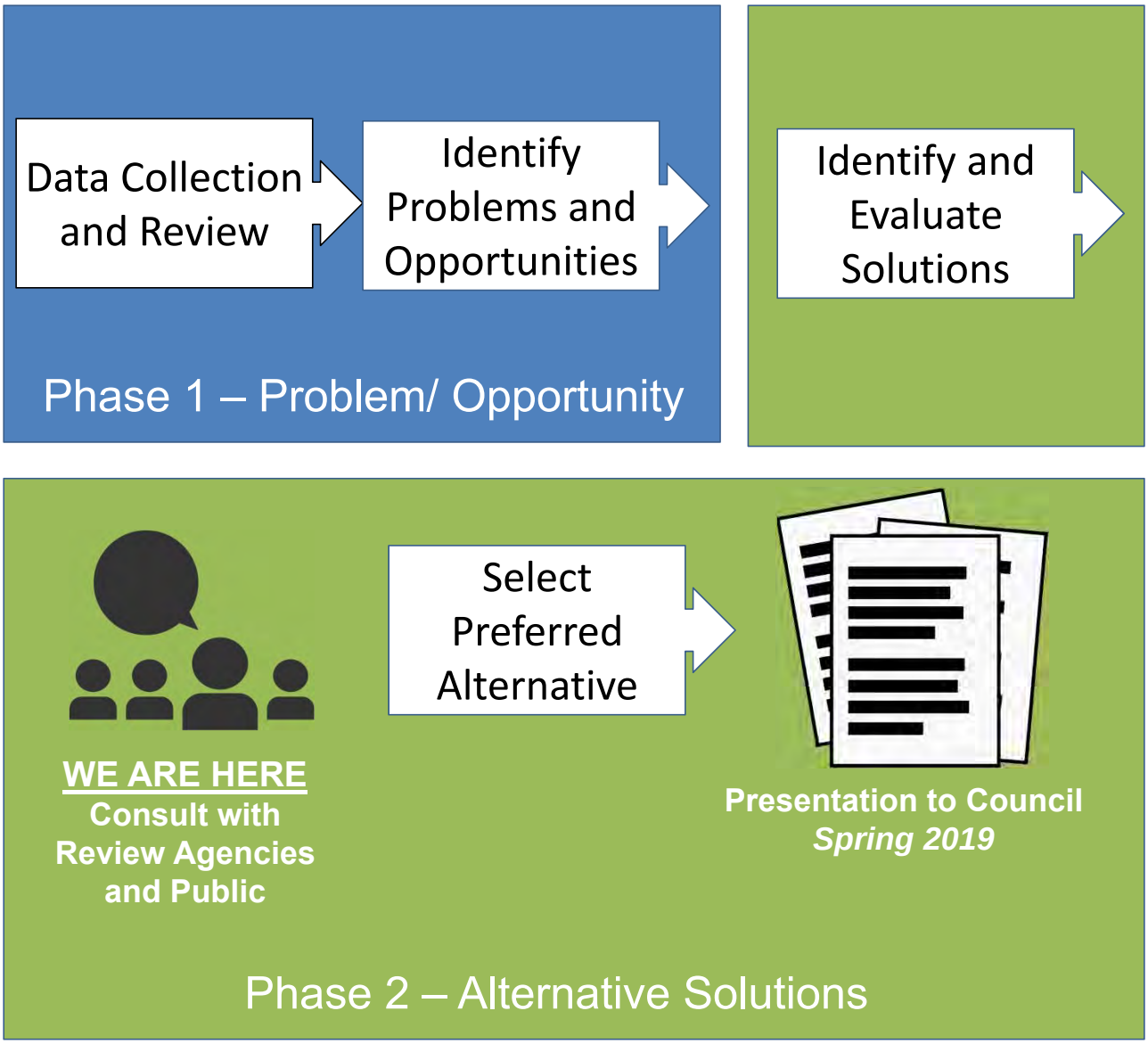
PREFERRED ALTERNATIVE

Alternative 3:

Construct a Forcemain to Townsend and Utilize Townsend and Jarvis Lagoons for Treatment

System Components	Advantages/ Disadvantages
• Construct 3.4 km forcemain to Townsend to convey wastewater to the Townsend lagoons. • Upgrade pumps at the Jarvis SPS. • Treat Jarvis wastewater at Jarvis or Townsend lagoons. • Capacity Increase: 420 – 745 m^3/day Capital Cost: $5,400,000 20-Year Lifecycle Cost: $6,100,000 ($1.12 - $1.99 per m^3) Rating: High Positive	• Townsend lagoons have sufficient surplus capacity to service long-term growth in Jarvis. • Lagoon based systems are simple and cost effective to operate compared to other alternatives. • Enables the County to utilize existing treatment infrastructure in Jarvis and Townsend. • Modest capital costs relative to other alternatives.

NEXT STEPS



- The proposed project is classified as a Schedule A+ undertaking. Schedule A+ projects are smaller scale with minimal adverse environmental impact. Schedule A+ projects are pre-approved; however, the public must be advised prior to implementation.
- Following this Information Center, public comments will be incorporated in a draft report to be presented to County Council this spring.
- The public will be notified prior to project implementation.

Appendix C

Public and Agency Comments

HAVE YOUR SAY

Haldimand County
Jarvis Master Municipal Class Environmental Assessment for Additional Wastewater Treatment Capacity

COMMENT FORM

Name (please print): [redacted] Date:

I represent a(n):
(please select the most applicable

Do you wish to receive upda

Contact N

Agency (if applic

Address (number, street, ap

City, Province, Postal

Ph

[redacted]

Please indicate any issue(s) that need to be explored/investigated as part of this Class EA:

SUPPORT ALT #3 PUMP TO TOWNSEND LAGOONS
FORCE MAIN DIRECTLY TO TOWNSEND LAGOONS
- MIN. EXTRA DISTANCE, SINGLE FORCE, ADDED TOTAL CAPACITY.

Please provide any additional comments about this Class EA:

HAVE COUNTY LOOK AT COMPLIMENTARY OPPORTUNITES.
WIDEN CONCESSION & TOWNLINE ROAD (EVEN A LITTLE)
THIS IS ON ROAD CYCLING ROUTE

Michael Troop, P.Eng.
Manager, Senior Environmental Engineer
J.L. Richards & Associates Limited
107-450 Speedvale Ave W
Guelph, ON N1H 7Y6
Phone: 519-763-0713 ext. 6522

Phil Wilson
Manager, Water & Wastewater Engineering
Haldimand County, Caledonia Satellite Office
282 Argyle Street South
Caledonia, ON N3W 1K7
Phone: 905-318-5932 Ext. 6431

Please return completed form to mtroop@jlrichards.ca

Note: Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record

HAVE YOUR SAY

Haldimand County
Jarvis Master Municipal Class Environmental Assessment for Additional Wastewater Treatment Capacity

COMMENT FORM

Name (please print [redacted] **Date:** April. 10, 2019

I represent a(n):
(please select the most applic [redacted]

Do you wish to receive u

Contac

Agency (if ap

Address (number, street,

City, Province, Pos

Please indicate any issue(s) that need to be explored/investigated as part of this Class EA:

Try to route as much as possible without disturbing new street surfacing.

Please provide any additional comments about this Class EA:

The forcemain definitely is the best solution

Michael Troop, P.Eng.
Manager, Senior Environmental Engineer
J.L. Richards & Associates Limited
107-450 Speedvale Ave W
Guelph, ON N1H 7Y6
Phone: 519-763-0713 ext. 6522

Phil Wilson
Manager, Water & Wastewater Engineering
Haldimand County, Caledonia Satellite Office
282 Argyle Street South
Caledonia, ON N3W 1K7
Phone: 905-318-5932 Ext. 6431

Please return completed form to mtroop@jlrichards.ca

Note: Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record

Appendix D

Lagoon Seasonal Storage Capacity

28176 Jarvis Lagoon Spring Storage

Scenario 1: 45 Days Discharge Period - March 15 to April 28

Month	Projected Average Daily Flow (m3/day)	Net Precipiation/ Evaoporation (m3/day)	Combined Net Precipitation/ Evaporation Average Daily Flow (m3/day)	Number of Days in Month	Number of Storage Days	Volume ADDED (m3)	Cumulative Volume (m3)	
March	1,638	288	1,926	31	0	0	0	
April	2,584	-4	2,580	30	2	5,160	5,160	*Assume lagoon empty on April 29
May	1,401	-52	1,349	31	31	41,829	46,989	
June	842	-100	742	30	30	22,266	69,255	
July	772	-75	697	31	31	21,605	90,860	
August	687	-4	683	31	31	21,167	112,027	
September	724	99	823	30	30	24,689	136,715	
October	1,044	193	1,237	31	31	38,346	175,062	*Fall discharge begins November 1
						175,062		

Scenario 1: 21 Days Discharge Period - March 15 to April 4

Month	Projected Average Daily Flow (m3/day)	Net Precipiation/ Evaoporation (m3/day)	Combined Net Precipitation/ Evaporation Average Daily Flow (m3/day)	Number of Days in Month	Number of Storage Days	Volume ADDED (m3)	Cumulative Volume (m3)	
March	1,638	288	1,926	31	0	0	0	
April	2,584	-4	2,580	30	26	67,082	67,082	*Assume lagoon empty on April 5
May	1,401	-52	1,349	31	31	41,829	108,910	
June	842	-100	742	30	30	22,266	131,176	
July	772	-75	697	31	31	21,605	152,781	
August	687	-4	683	31	31	21,167	173,948	
September	724	99	823	30	30	24,689	198,637	
October	1,044	193	1,237	31	31	38,346	236,983	*Fall discharge begins November 1
						236,983		

Scenario 3: 30 Days Discharge Period - April 5 to May 4

Month	Projected Average Daily Flow (m3/day)	Net Precipiation/ Evaoporation (m3/day)	Combined Net Precipitation/ Evaporation Average Daily Flow (m3/day)	Number of Days in Month	Number of Storage Days	Volume ADDED (m3)	Cumulative Volume (m3)	
March	1,638	288	1,926	31	0	0	0	
April	2,584	-4	2,580	30	5	12,900	12,900	
May	1,401	-52	1,349	31	27	36,431	49,332	* Assume lagoon empty on May 5
June	842	-100	742	30	30	22,266	71,598	
July	772	-75	697	31	31	21,605	93,203	
August	687	-4	683	31	31	21,167	114,369	
September	724	99	823	30	30	24,689	139,058	
October	1,044	193	1,237	31	31	38,346	177,405	* Fall discharge begins November 1
						177,405		

28176 Jarvis Lagoon Fall Storage

Scenario 1: 45 Days Discharge Period - November 1 to December 15

Month	Projected Average Daily Flow (m3/day)	Net Precipiation/ Evaoporation (m3/day)	Combined Net Precipitation/ Evaporation Average Daily Flow (m3/day)	Number of Days in Month	Number of Storage Days	Volume ADDED (m3)	Cumulative Volume (m3)	
November	1,292	313	1,605	30	0	0	0	
December	976	295	1,272	31	16	20,344	20,344	* Assume lagoon empty on December 16
January	1,827	253	2,080	31	31	64,486	84,830	
February	1,549	236	1,784	28	28	49,962	134,792	
March	1,638	288	1,926	31	15	28,897	163,689	*Spring discharge begins March 15
						163,689		

Scenario 2: 21 Days Discharge Period - November 1 to November 21

Month	Projected Average Daily Flow (m3/day)	Net Precipiation/ Evaoporation (m3/day)	Combined Net Precipitation/ Evaporation Average Daily Flow (m3/day)	Number of Days in Month	Number of Storage Days	Volume ADDED (m3)	Cumulative Volume (m3)	
November	1,292	313	1,605	30	9	14,447	14,447	*Assume lagoon empty on November 22
December	976	295	1,272	31	31	39,417	53,864	
January	1,827	253	2,080	31	31	64,486	118,349	
February	1,549	236	1,784	28	28	49,962	168,311	
March	1,638	288	1926.441704	31	15	28,897	197,208	*Spring discharge begins March 15
						197,208		

Scenario 3: 30 Days Discharge Period - November 1 to November 30

Month	Projected Average Daily Flow (m3/day)	Net Precipiation/ Evaoporation (m3/day)	Combined Net Precipitation/ Evaporation Average Daily Flow (m3/day)	Number of Days in Month	Number of Storage Days	Volume ADDED (m3)	Cumulative Volume (m3)	
November	1,292	313	1,605	30	0	0	0	* Assume lagon empty on November 30
December	976	295	1,272	31	31	39,417	39,417	
January	1,827	253	2,080	31	31	64,486	103,903	
February	1,549	236	1,784	28	28	49,962	153,865	
March	1,638	288	1,926	31	31	59,720	213,584	
April	2,584	-4	2,580	30	5	12,900	226,485	* Spring discharge begins April 5
						226,485		

Appendix E

Detailed Alternatives Evaluation Matrix

⮝⮝ Very Positive
⮝ Positive
● Neutral
⮟ Negative
⮟⮟ Very Negative

Haldimand County
Municipal Class EA for Additional Wastewater Treatment Capacity in Jarvis
Evaluation Matrix

	Alternative 7		Alternative 8		Alternative 9		Alternative 11	
Criteria		**Increase Rated Capacity of the Lagoon, Enhance Treatment, and Change to Continuous Discharge Period.**		**Increase Rated Capacity of the Lagoon, Acquire Land to Add a New Lagoon Cell, No Change in Discharge Period**		**Pump Sewage to Townsend Lagoon and Maintain Existing Jarvis Lagoon (no change in rated capacity)**		**Alternative 11: Decommission the Jarvis Lagoons and Build a Mechanical Treatment Plant at the Same Site or New Site.**
System Components		- New enhanced treatment cells - New filter for TSS removal - Continuous alum feed system - Mechanical/chemical Building - Associated yard pipes and valves - Land acquisition		- 70,000 m3 lagoon cell - Associated yard pipes and valves - Land acquisition		- 3.4 km forcemain to Townsend - Modifications to yard piping at SPS - Replace 3 existing pumps - Does not include upgrades at Townsend SPS if required		- New mechanical treatment plant - Decommission existing lagoon - Land acquisition
Natural Environment								
Groundwater	●	Potential Negative Impact - There is the potential to negatively impact groundwater due to dewatering activities during construction.	●	Potential Negative Impact - There is the potential to negatively impact groundwater due to dewatering activities during construction.	●	Potential Negative Impact - There is the potential to negatively impact groundwater due to dewatering activities during construction.	●	Potential Negative Impact - There is the potential to negatively impact groundwater due to dewatering activities during construction.
Fish, Aquatic Life, Vegetation	⮝⮝	High Positive: Very high effluent quality can be achieved so that there is no increase in loading to the receiving water body (Sandusky Creek) if rated capacity is increased.	⮟⮟	High Negative: Good quality effluent will be produced with respect to cBOD and TSS, however, with lagoon treatment alone it will be difficult to achieve the ammonia limits required to protect aquatic life.	●	Neutral: There will be no change to effluent quality at Jarvis and discharge at Townsend will be within existing ECA limits.	⮝⮝	High positive: Very high effluent quality can be achieved, potentially decreasing loading to the receiving water body (Sandusky Creek) even if rated capacity is increased.
Terrestrial Vegetation & Wildlife	●	Potential Negative Impact: Construction has the potential to disrupt vegetation and wildlife. This should be should be confirmed prior to construction.	●	Potential Negative Impact: Construction has the potential to disrupt vegetation and wildlife. This should be should be confirmed prior to construction.	●	Potential Negative Impact: Construction of the forcemain will occur over a relatively long distance though agricultural and natural areas and has the potential to disrupt vegetation and wildlife. This should be should be confirmed prior to construction.	●	Potential Negative Impact: Construction has the potential to disrupt vegetation and wildlife. This should be should be confirmed prior to construction.
Soils and Geology	●	Neutral: No settlement or slope stability issues are anticipated. Geotechnical conditions should be confirmed prior to construction.	●	Neutral: No settlement or slope stability issues are anticipated. Geotechnical conditions should be confirmed prior to construction.	●	Neutral: No settlement or slope stability issues are anticipated. Geotechnical conditions should be confirmed prior to construction.	●	Neutral: No settlement or slope stability issues are anticipated. Geotechnical conditions should be confirmed prior to construction.
Social Environment								
Community Development	⮝⮝	High Positive Impact: Enhanced treatment could be designed to service residential, commercial and industrial users beyond 20-years. With enhanced treatment the lagoons should have sufficient capacity to service long-term growth in Jarvis.	⮟⮟	High Negative Impact: It may be very difficult to consistently achieve the effluent quality required to service to 20-year populations.	⮝⮝	High Positive Impact: The pumping station could be expanded to service residential, commercial and industrial users beyond 20-years. The Townsend lagoons have sufficient surplus capacity to service long-term growth in Jarvis.	⮝⮝	High Positive Impact: A mechanical treatment plant could be expanded to service residential, commercial and industrial users beyond 20-years. A mechanical treatment plant will have sufficient capacity to service long-term growth Jarvis.
Public Health	●	Neutral: The proposed system is a municipal wastewater treatment system which is required to meet strict regulatory standard to protect public health. No change to public heath impacts are anticipated.	●	Neutral: The proposed system is a municipal wastewater treatment system which is required to meet strict regulatory standard to protect public health. No change to public heath impacts are anticipated.	●	Neutral: The proposed system is a municipal wastewater treatment system which is required to meet strict regulatory standard to protect public health. No change to public heath impacts are anticipated.	●	Neutral: The proposed system is a municipal wastewater treatment system which is required to meet strict regulatory standard to protect public health. No change to public heath impacts are anticipated.
Noise	●	Potential Negative: Depending on the treatment option selected, there may be a slight increase in noise on site due to the operation of aeration equipment etc., however, impacts are anticipated to be modest. There will be temporary increases in noise related to construction.	●	Neutral: No changes to noise on site are anticipated as part of this alternative. There will be temporary increases in noise related to construction.	●	Neutral: No changes to noise on site are anticipated as part of this alternative. There will be temporary increases in noise related to construction.	●	Potential Negative: Depending on the treatment option selected, there may be an increase in noise on site due to the operation of aeration equipment etc. and delivery of chemicals. Impacts may be noticed by adjacent land owners. There will be temporary increases in noise related to construction.
Aesthetics	●	Neutral: Changes to the site will be modest and the aesthetic impact of infrastructure will be similar to existing.	●	Neutral: Changes to the site will be modest and the aesthetic impact of infrastructure will be similar to existing.	●	Neutral: Changes to the SPS site will be modest and the aesthetic impact of infrastructure will be similar to existing. The forcemain will be buried with no impact on aesthetics.	●	Negative: Significant changes will occur on site (e.g. new treatment buildings and concrete tankage) that may have a negative aesthetic impact.
Air Quality and Odours	⮟	Potential Negative: There have not been odour complaints associated with the existing system. There may be an increase in odours on site due to changes to the treatment process. There is potential to impact nearby residential properties.	⮟	Potential Negative: There have not been odour complaints associated with the existing system. There may be an increase in odours on site due to changes to the treatment process. There is potential to impact nearby residential properties.	●	Neutral: There have not been odour complaints associated with the existing system, no significant change in odour is anticipated. More treatment will be occurring in Townsend away from residential properties.	⮟	Potential Negative: There have not been odour complaints associated with the existing system. There may be an increase in odours on site due to changes to the treatment process. There is potential to impact nearby residential properties.
Cultural Environment								
Archaeological and Heritage Resources	●	Potential Negative Impact - Construction has the potential to disrupt archaeological resources. This should be should be confirmed prior to construction.	●	Potential Negative Impact - Construction has the potential to disrupt archaeological resources. This should be should be confirmed prior to construction.	●	Potential Negative Impact - Construction has the potential to disrupt archaeological resources. This should be should be confirmed prior to construction.	●	Potential Negative Impact - Construction has the potential to disrupt archaeological resources. This should be should be confirmed prior to construction.
Technical Environment								
Constructability and Construction Schedule	⮟	Potential Negative: Construction will temporally impact existing lagoon operations at Jarvis. There is a longer approvals process required.	⮟	Potential Negative: Construction will temporally impact existing lagoon operations at Jarvis. There is a longer approvals process required.	⮟	Potential Negative: The forcemain route is relative clear of obstacles (e.g. no river crossings). Construction may disrupt traffic over the 3km forcemain route over the construction period.	⮟⮟	High Negative: Significant work is required. It may be challenging to keep the existing lagoon in service during construction if built at the existing site.
Phasing and Expandability	⮝	Positive: Treatment processes can be constructed/expanded in phases.	●	Neutral/Negative: Construction of the new cell would not likely be phased.	⮝⮝	High Positive: The forcemain would be designed for the ultimate capacity, the SPS upgrades could occur in phases. In the future, expansion could occur at Jarvis or Townsend.	⮝	Positive: The treatment capacity of the plant could be expanded in phases.
Operational Control	⮝	Positive: There are a number of factors that can be controlled in the enhanced treatment process; however, the lagoon (relatively uncontrolled process) is still required for treatment.	⮟⮟	High Negative: There are a limited number of factors that can be controlled in a lagoon treatment process to ensure very high effluent quality is achieved.	⮝	Positive: The Townsend lagoon has conventional treatment limits for a lagoon and is operating well below its rated capacity. This decreases the need for operational control.	⮝⮝	High Positive: There are a number of process variables that can be controlled in this process. The existing lagoon is not required for treatment.
Operational Complexity	⮟	Negative: The new process will require regular operator input and review. Mechanical parts will require regular maintenance. It's anticipated that a half time operator will be required to run/monitor operations.	⮝⮝	High Positive: No change in the operational complexity.	●	Potential Positive or Negative: To minimize operational complexity it is recommended that under normal operation sewage be pumped via one force main. Switching between two for mains may be operationally complex and could led to H2S issues in the pipes and flushing would be required. However, operations could be simplified and it may be possible to discontinue use of the Jarvis lagoons, consolidating treatment operations at one lagoon.	⮟⮟	High Negative: A plant will be more complex then a lagoon based system to operate. At least one full time operator would be required.
System Redundancy and Resiliency	⮝	Positive: Redundancy can be incorporated into the advanced treatment system design.	●	Neutral: The addition cell may add some redundancy to perform maintenance operations and optimize operations and conduct maintenance activities.	⮝⮝	High Positive: The system is reliant on the Jarvis SPS, however, there are redundant forcemains and treatment. There will be flexibility to direct flows to Jarvis or Townsend during routine or emergency maintenance activities.	⮝⮝	High Positive: Mechanical treatment plants are highly reliable and design can include redundancy.
Utilizes Existing Infrastructure	⮝	Positive: Continues to utilize the lagoon for treatment, however, new treatment cells/tanks are required. Pumping may be required depending on the location of reactor cells. Site electrical servicing may need upgrading.	⮝	Positive: Continues to utilize the lagoon for treatment. A new cell is required for treatment, but no other infrastructure upgrades are required on site.	⮝⮝	High Positive: The existing SPS and lagoons at Jarvis and Townsend are utilized. This option takes advantage of surplus capacity in Townsend.	⮟⮟	High Negative: Existing lagoons would be decommissioned.
Economic Environment								
Capital Costs*		$5,200,000		$7,400,000		$5,400,000		$10,000,000
Operational Costs (per year)**		$130,000		$30,000		$34,500		$250,000
20-Year Lifecycle Costing		$7,800,000		$8,000,000		$6,100,000		$15,000,000
Overall Rating		⮝		⮟		⮝⮝		●

* Costs exclude upgrades to Jarvis SPS that would be common to all options after 20-year flows are reached (70 l/s). Cost to upgrade Townsend SPS not included (review during detailed design).
**Costs exclude biosolids management and pumping costs common to all options

HALDIMAND COUNTY

Memorandum PDD-M02-2019 LPRCA Riverine Flood Hazard Mapping Update Study

For Consideration by Council in Committee on June 18, 2019

To: Mayor Hewitt and Members of Council

From: Justin Miller, Planner

The Long Point Region Conservation Authority (LPRCA) has initiated a scoped study to update its riverine floodplain mapping within a few priority communities, including Jarvis and surrounding rural area. The study began in April (2019) and is scheduled to be completed in February 2020. Accurate floodplain mapping is critical to minimizing the risk to life and property, to support emergency management and to plan for long-term flood mitigation, where feasible. LPRCA's current floodplain mapping is 40+ years old and is primarily sourced from a 1977 study. The proposed study will utilize recent advances in hydraulic modeling and updates to provincial technical guidelines. The end result for the priority communities will be more accurate floodplain mapping that better illustrates the extent of riverine flooding in accordance with current provincial standards. This will serve to provide additional information for planning the use of a property (e.g. to avoid hazardous areas during construction) and to better prepare for emergency situations (e.g. flood avoidance/rescues situations).

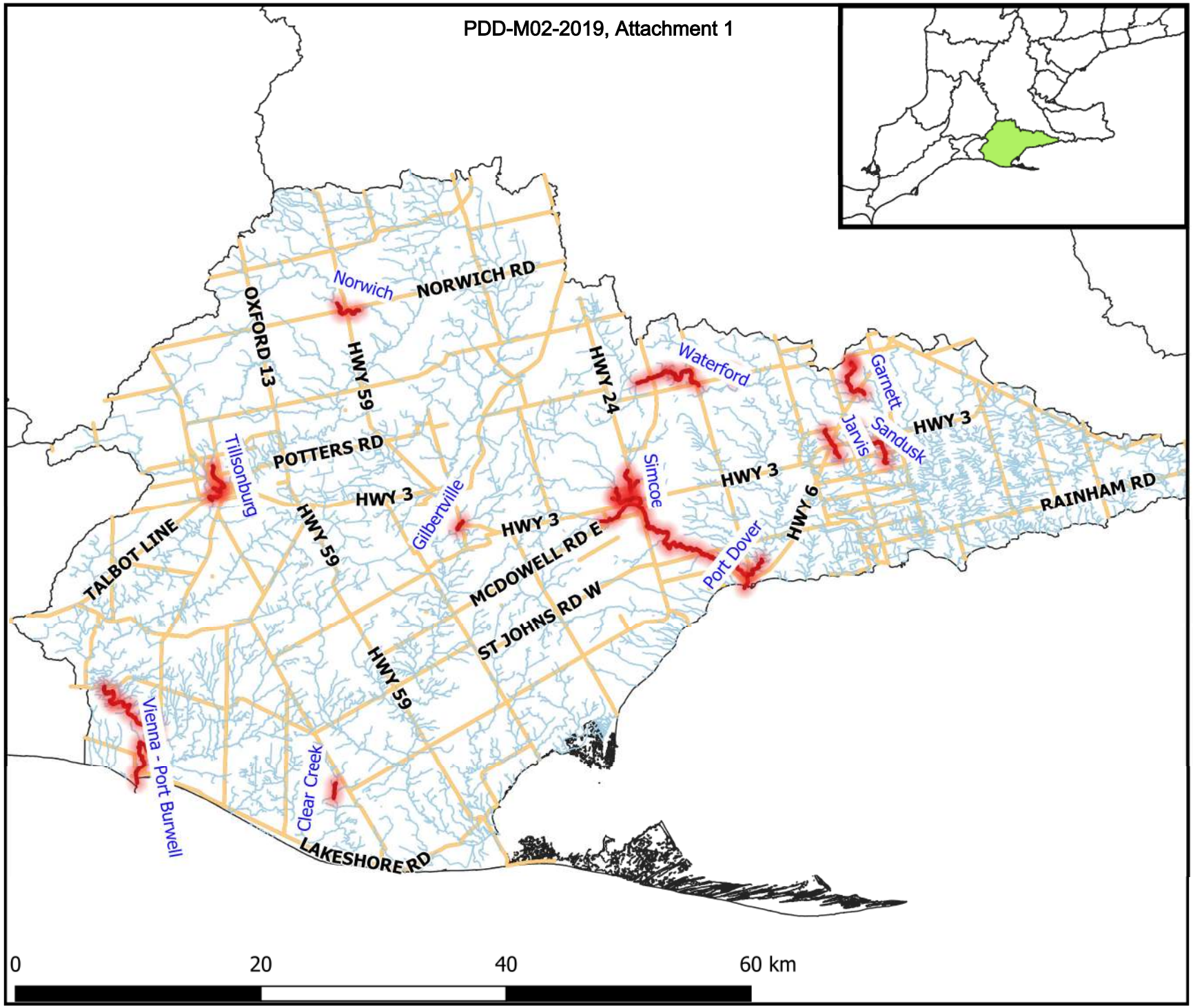
LPRCA's watershed jurisdiction covers five different Counties: Haldimand, Norfolk, Brant, Oxford and Elgin Counties. Current funding opportunities allow for updates to be made only to a few priority areas within LPRCA's jurisdiction. Within Haldimand County, three sections of watercourses are proposed to be updated: a tributary to Sandusk Creek near Garnett, a tributary to Sandusk Creek that flows through Jarvis, and a tributary to Sandusk Creek east of Jarvis. Please see (Attachment 1) for the proposed project locations.

The initiated study will include: background review, base map preparation, flood hazard mapping preparation, an update to National Disaster Mitigation Program risk assessment information template (required as a condition of federal funding), a final report and six public information centres. Three public information centres (PIC's) will be held throughout LPRCA's jurisdiction two times during the study's duration. The PIC's are currently proposed for some time in late June 2019 and January 2020; due to the geography to be covered by this study, PIC's are intended to be held in Vienna (Elgin County), Simcoe (Norfolk County) and Tillsonburg (Oxford County) – meaning that interested Haldimand County residents would attend the PIC's scheduled to be held in Simcoe given that is closest and would present the content for the County's portion of the study. Staff will communicate dates of the PIC's to Council as they are confirmed and will ensure there are press releases and other communications to Haldimand residents using the County's website and social media platforms.

The study is being undertaken at no additional cost to Haldimand County, and Planning staff have been engaged as part of the project team, which includes the consulting engineers (Wood Environment & Infrastructure Solutions), staff from the member Counties and LPRCA. At completion, the study will more accurately reflect the riverine flood hazard in three locations of Haldimand County as noted above. This technical information will be of use to Haldimand County, LPRCA and others when it comes to minimizing the risk to life and property due to riverine flooding.

ATTACHMENTS:

1. Long Point Region Conservation Authority (LPRCA) Study Area.



Proposed Mapping

LPRCA Watershed

Legend

- Proposed Mapping
- Watercourse

Roads

- Major Roads
- Minor Roads

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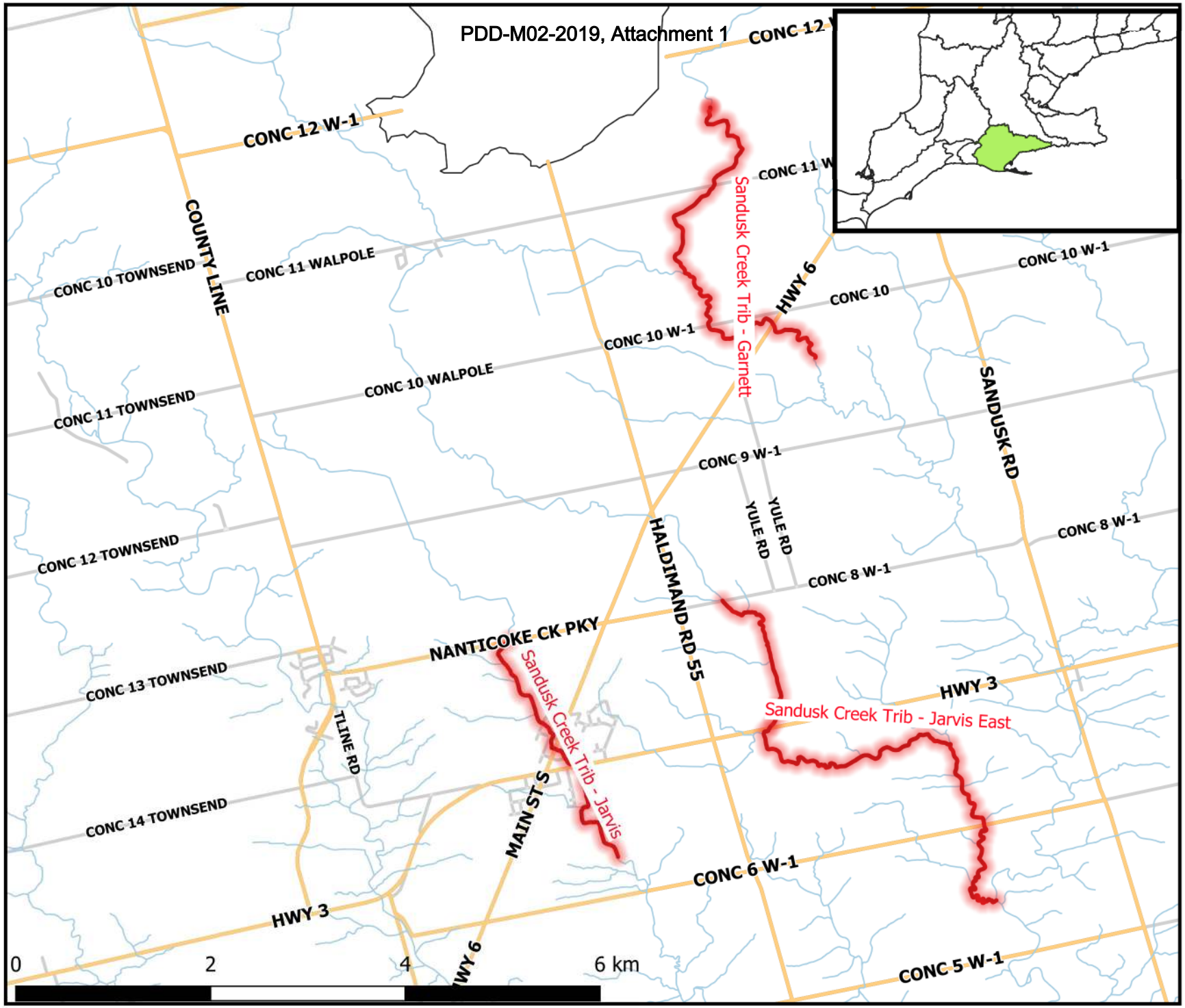

Proposed Mapping

Study Area - Jarvis, Jarvis East & Garnett

Watercourse- Sandusk Creek

Legend

- Proposed Mapping
- Watercourse

Roads

- Major Roads
- Minor Roads

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HALDIMAND COUNTY

Memorandum ECW-M01-2019 Speed Sign Protocol Updates

For Consideration by Council in Committee on June 18, 2019

To: Mayor Hewitt and Members of Council

From: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

At the June 5, 2018 Council-in-Committee meeting Report CS-GM-04-2018 Speed Warning Devices Deployment Protocol provided a protocol for the deployment of speed warning devices including data collection devices (Speed Spy's), a trailer mounted speed warning sign and pole mounted speed warning signs. This protocol was based on input from the Haldimand Police Services Board (PSB), Ontario Provincial Police (OPP) and County staff.

Through the protocol Haldimand County is responsible for the deployment of the trailer mounted speed warning sign and the pole mounted warning signs. The Speed Spy units are deployed by the OPP and the data is supplied to Haldimand County through the PSB.

The one trailer mounted sign and the twelve pole mounted signs have been in use since August 2018 and the original list of deployment locations for the trailer mounted unit is almost finished. At this time staff are proposing modifications to the Speed Warning Devices Deployment Protocol based on the types of requests received for deployment particularly those received by the ward councillors.

The proposed changes were reviewed by the Police Services Board on May 29, 2019 and the feedback from the board has been incorporated into the updated protocol.

A summary of the proposed changes shown in red text (see attached) for the Speed Warning Devices Deployment Protocol is as follows:

Speed Spy Data Collection Devices (4 units)

No change.

Portable Trailer Mounted Speed Warning Sign (1 unit)

The primary change is the deployment of this device which will be based on Ward Councillor input. Previously this unit was to be assigned based on OPP recommendations (focusing in rural areas), special events or county road construction projects. The unit will cycle through the wards in order starting with Ward 1 and if no location is identified for a specific ward then the unit will move to next ward on the list. From time to time, the OPP may request the unit for deployment on an as-needed basis (i.e. special events).

The other change is the deployment of this device which will be on a two week deployment cycle rather than the current one week deployment cycle. Staff believe this will provide more effective coverage at each location.

Pole Mounted Speed Warning Signs (12 units = 2 per Ward)

The primary change is a twelve month deployment time as opposed to the six months in the original protocol. Staff believe that this time frame will provide more effective coverage and will also reduce the costs associated with redeploying the devices.

SPEED WARNING DEVICES DEPLOYMENT PROTOCOL

Speed Warning Devices Definition:

The Speed Warning devices affected by this protocol include:

- Speed Spy data collection devices (including the two current devices in the possession of the Haldimand OPP Detachment)
- Portable trailer mounted speed warning sign
- Pole mounted speed warning signs

Acquisition & Ownership of Equipment:

Haldimand County will directly administer all procurement processes for the three (3) types of devices as defined above. The OPP will provide input as to the specifications that meet their needs, where applicable, as well as any preferential pricing opportunities that may be available through the Province of Ontario.

Haldimand County will own the equipment, with any future replacements subject to future budget approvals.

Haldimand County will insure the equipment. Any repairs or replacements related to an insurable event (vandalism, theft, etc.) must be reported promptly to County staff with all relevant details of the incident.

Deployment of Equipment:

~~All Council members, Police Services Board members and/or public suggested locations for speeding enforcement initiatives, using any of the equipment outlined in this protocol, will be requested through the Haldimand OPP Detachment Commander via email, with a copy to the Staff Sergeant.~~

The protocol for deployment of specific equipment will be as outlined below.

Speed Spy Data Collection Devices ~~(currently 2 units; increasing to 4 units)~~

The OPP will determine the location and duration for deployment of this equipment.

Data collected by the devices will be analyzed by the OPP and provided to Haldimand County staff for dissemination to Council, Senior Management Team and the public (through posting for a minimum of six months, up to one year, on the County website).

The Haldimand OPP Detachment will have full care and custody of these devices and arrange for deployment/redeployment through their own resources.

Portable Trailer Mounted Speed Warning Signs ~~(1 unit)~~

This unit will be in the care and custody of the County's Roads Operations Division with deployment coordination through the ~~Transportation~~ Engineering Services Division ~~Technologist or the Roads Operations Technologist~~.

Locations for deployment of this device will be based on the following:

- Ward Councillor input
- OPP requests for deployment on an as-needed basis (i.e. special events)
- The unit will cycle through the wards in order starting with Ward 1. If no location is identified for a specific ward then the unit will move to next ward on the list
- ~~OPP recommendations (focusing in rural areas)~~
- ~~Special events~~
- ~~County road construction projects~~

Location criteria:

- Minimum shoulder width of 8 feet required to accommodate a minimum of 3 feet setback from the pavement edge
- Minimum sightlines: 12 m sightline triangle near intersections; cannot impede driveway sightlines nor obstruct sidewalks
- Deployment for ~~a minimum of 7 consecutive days~~ two weeks per location.
- ~~Minimum 1 week notice in advance of the desired deployment date, unless an emergency~~

Movement of this device will be performed by County staff. Winter storage may be required depending on weather conditions to prevent damage to unit.

Pole Mounted Speed Warning Signs ~~(12 units = 2 per Ward)~~

These units will be in the care and custody of the County's Roads Operations Division, with deployment coordination through the Transportation Engineering Technologist.

Locations for deployment of this device will be based on the following:

- Ward Councillor input ~~and OPP advice (refer to maps~~)
- OPP advice and consultation

Location criteria:

- mounted on 6x6 supporting posts or on County owned street light poles to avoid the need to get approval of third parties for use of their poles
- ~~maintained in the same location for a minimum of 6 months in order to monitor the effectiveness over time~~ Deployment for 12 months per location.

Equipment specification preferences (provisional items)

- Solar powered
- Data collection with Bluetooth capabilities (for Engineering – traffic pattern analysis)

The installation of these units will be contracted to a third party through the initial procurement process. Any future movement of these devices will be subject to budget approval for the contracted electrical services.

~~Monitoring (M/R): through standard County road patrols, any~~ Maintenance issues (i.e. battery replacement) will be reported to the Engineering Services Division ~~Roads Operations Technologist~~ who will coordinate repairs/maintenance. Changing of preloaded messages will be administered through the ~~Transportation~~ Engineering Services Division ~~Technologist~~ who will also collect the

data recorded by the devices as required. ~~on traffic patterns if remote (Bluetooth) capabilities.~~

HALDIMAND COUNTY

Report ENG-01-2019 Accessible Parking Spaces at Hagersville United Church

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To receive Council approval to amend Haldimand County Parking Control By-law 307/02 in order to create two accessible parking spaces in front of the Church Street entrance to the Hagersville United Church.

RECOMMENDATIONS:

1. THAT Report ENG-01-2019 Accessible Parking Spaces at Hagersville United Church be received;
2. AND THAT Haldimand County Parking Control By-law 307/02, Schedule “H” Physically Disabled Parking – Hagersville, be amended as outlined in Report ENG-01-2019.

Prepared by: Kristopher R. Franklin, Manager, Engineering Services

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

In response to concerns raised by the local Councillor regarding access to the Hagersville United Church for elderly parishioners, staff have reviewed the existing parking conditions on the north side of Church Street in Hagersville and are recommending that two accessible parking spaces be established at the entrance of the Hagersville United Church.

BACKGROUND:

As shown in the attached photo (see Attachment 1) the Hagersville United Church has a pedestrian entrance on Church Street West. Parking is currently permitted along this section of Church Street West including the area in front of the pedestrian entrance.

Based on discussions with the local Councillor and feedback from the Hagersville United Church, there have been issues with cars parking in front of the pedestrian entrance and blocking access to those people needing assistance going in and out of the building. It was also noted that a number of the parishioners are elderly and require additional assistance getting in and out of the church.

ANALYSIS:

Staff have reviewed the existing conditions and based on the configuration of the entrance, are recommending that two accessible parking spaces (see Attachment 2) be established to keep access to the entrance available to those needing assistance. The County’s Accessibility Advisory Committee

reviewed the proposed changes at their June 11, 2019 meeting and are in agreement with the location of the two new AODA spaces.

Based on a site visit and the number of existing parking spots, it is anticipated that the proposed accessible parking spaces will not impact the local residents who currently park on the street or people visiting the United Church, as there is sufficient on-street parking in this area.

In order to create the accessible parking spaces the following change to Haldimand County Parking Control By-law 307/02 is required:

Parking Control By-law 307/02 Schedule "H" Physically Disabled Parking – Hagersville to Add

Street	Side	From	To
Church Street West	North	29 metres west of Main Street	42 metres west of Main Street

FINANCIAL/LEGAL IMPLICATIONS:

Roads Operations will be responsible for installing the required signage and line painting. The estimated cost is approximately $500 and will be funded from the applicable Road Operations operating accounts.

STAKEHOLDER IMPACTS:

Not applicable

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Photo of Hagersville United Church
2. Church Street West - Proposed Accessible Parking Spaces

ENG-01-2019 Attachment 2

HALDIMAND COUNTY

Report ENG-06-2019 Port Maitland Road No Stopping Zone - Parking Control By-law Amendment

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To provide Council with a recommendation in response to a request for a no stopping zone along the east side of Port Maitland Road in the park area.

RECOMMENDATIONS:

1. THAT Report ENG-06-2019 Port Maitland Road No Stopping Zone - Parking Control By-law Amendment be received;
2. AND THAT Haldimand County Parking Control By-law 307/02, Schedule “B” No Stopping - Dunnville, be amended as outlined in Report ENG-06-2019

Prepared by: Judy Brown, Traffic Technologist, Engineering Services

Reviewed by: Kristopher R. Franklin, Manager, Engineering Services

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

In response to concerns raised by Haldimand County Facilities, Parks, Cemeteries & Forestry Operations staff and residents of Port Maitland Road, staff have reviewed the existing parking conditions on Port Maitland Road from The Esplanade to the south end of Port Maitland Road and are recommending a no stopping zone be created on the east side of the road to alleviate issues related to traffic flow, parking and emergency vehicle access.

BACKGROUND:

Port Maitland Road provides access to the Esplanade Park and the Port Maitland Pier where there is a public boat launch. The road varies from 4.8 to 6.0 metres in width and provides access to Esplanade Park and the Port Maitland pier on the east side of the road. Three cable guide rail runs along the majority of the east side of the road to prevent cars from driving into the park.

Off street parking to service the park and boat launch includes spaces for nineteen cars, two AODA stalls, and ten long stalls for vehicles with trailers and boats. Parking is currently permitted on both sides of this section of Port Maitland Road.

Haldimand County Facilities, Parks, Cemeteries & Forestry Operations staff, as well as local residents have identified issues related to traffic flow on Port Maitland Road when vehicles are parked on both sides of the road. Based on a site visit these issues include vehicles with boat trailers having difficulty

using the road when cars are parked on both sides of the road and emergency vehicle access along Port Maitland Road.

It should be noted that a new parking area is planned at the north end of the park in 2022 to provide additional off-street parking.

ANALYSIS:

In order to alleviate the identified traffic flow and access issues, staff are recommending that a no stopping zone be established on the east side of Port Maitland Road to ensure free and clear access at all times for emergency services vehicles and the public (see Attachment 1).

To create the no stopping zone the following change to Haldimand County Parking Control By-law 307/02 is required:

Parking Control By-law 307/02 Schedule "B" No Stopping – Dunnville to add

Street	Side	From	To	Period
Port Maitland Road	East	The Esplanade	South to end	Anytime

FINANCIAL/LEGAL IMPLICATIONS:

Roads Operations will be responsible for installing the required signage and line painting. The estimated cost is approximately $400 and will be funded from the Road Operations regulatory/warning signage operating account.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Proposed No Stopping Zone Port Maitland Road

ENG-06-2019 Attachment 1

HALDIMAND COUNTY

Report ENG-09-2019 All Way Stop - Sweets Corners Road and Lakeshore Road

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To seek Council approval to install an all way stop at the intersection of Sweets Corners Road and Lakeshore Road.

RECOMMENDATIONS:

1. THAT Report ENG-09-2019 All Way Stop - Sweets Corners Road and Lakeshore Road be received;
2. AND THAT the required by-law be presented for enactment to authorize the installation of an all way stop condition at the intersection of Sweets Corners Road and Lakeshore Road.

Prepared by: Kristopher R. Franklin, Manager, Engineering Services

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The Council approved All Way Stop Installation Warrant Policy provides staff with a consistent way of addressing requests for all way stops.

While the criteria in the All Way Stop Installation Warrant Policy are not met for this location, staff are recommending that an all way stop at the intersection of Sweets Corners Road and Lakeshore Road be implemented to improve safety at the intersection.

BACKGROUND:

The intersection of Sweets Corners Road and Lakeshore Road occurs at a bend in Lakeshore Road resulting in a Y-intersection (see Attachment 1) with a stop condition on Sweets Corners Road. This configuration makes it difficult for drivers to determine right-of-way at the intersection, particularly for vehicles heading eastbound on Lakeshore Road and turning left onto Sweets Corners Road.

Haldimand County Roads Operations staff and local residents have identified the confusion with the alignment caused by the bend as a possible safety issue.

ANALYSIS:

Haldimand County's All Way Stop Installation Warrant Policy No. 2007-03 (see Attachment 2) provides criteria to assess all way stop condition factors such as posted speeds, intersection layout and traffic volumes.

Staff have used the policy to evaluate the requested all way stop at Sweets Corners Road and Lakeshore Road. There are two parts to the warrant. All of the warrants in Part One must be satisfied to continue with Part Two. All of the warrants in Part Two must be satisfied to justify an all way stop.

The results of the all way stop evaluation are as follows:

Part One – Consideration:

For a warrant to be considered, all of the following conditions must be satisfied :

1. Minimum posted speed – *satisfied (50 km/h)*
2. Closest traffic control device – *satisfied (more than 250 metres away)*
3. Intersection configuration – *satisfied*
4. Arterial intersections – combined volume of vehicles and pedestrians from minor street - *not applicable*
5. Secondary intersections - combined volume of vehicles and pedestrians from minor street – *not satisfied – Sweets Corners is 13% of total volume (35% required)*

As Item 5 under Part One – Consideration has not been met, the warrants are not considered satisfied and an all way stop condition is not recommended based on the traffic volume split in Item 5.

While the Part One requirements of the warrant are not met, County staff are recommending that an all way stop (see Attachment 3) be implemented at this location for the following reasons:

- Haldimand County Roads Operation staff have identified a public safety concern at this intersection due to the alignment of Lakeshore Road at the intersection.
- County staff have evaluated the intersection and determined that an all way stop will effectively resolve the issues related to right-of-way at the Y-intersection.
- County staff have reviewed the traffic volumes and concluded that the installation of an all way stop condition at this location will not negatively impact traffic flow.

FINANCIAL/LEGAL IMPLICATIONS:

Roads Operations will be responsible for installing the required signage. The estimated cost is approximately $500 and will be funded from the Road Operations regulatory/warning signage operating account.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Existing Conditions – Sweets Corners Road and Lakeshore Road
2. All Way Stop Installation Warrant Policy No. 2007-03
1. Proposed All Way Stop – Sweets Corners Road and Lakeshore Road

Sweets Corners Road and Lakeshore Road

ENG-09-2019 Attachment 1

Existing Conditions

HALDIMAND COUNTY
POLICY No. 2007- 03

Subject: **All WAY STOP INSTALLATION WARRANT POLICY**

Purpose:

To establish warrants or criteria that must be met in order to consider the installation of an All Way Stop condition at an intersection.

Policy:

Scope: This policy is intended to be applicable to all roads under the County jurisdiction.

Authority: The Highway Traffic Act authorizes Municipalities to pass by-laws to amend traffic conditions.

Objectives: The goal is to provide a process by which all requests are received, be considered and warrants for the implementation of an all way stop.

Requests

A written request with supporting documentation shall be submitted to the Physical Services Department. Copies will be forwarded to the Ward Councillor.

Warrants

There are two parts to the warrant. All of the warrants in part one must be satisfied to continue with part two.

Part One – Consideration

For a warrant to be considered all of the following must be satisfied.

1. A minimum posted speed of 50km/h.
2. The closest traffic control device is located at least 700 meters away for arterial intersection and 250 meters away for secondary intersections.
3. The intersection has three or four legs with no more than two lanes on each leg. Each leg must be a minimum of 150 meters in length.
4. For arterial intersections the combined volume of vehicles and pedestrians entering from the minor street over eight hours must be at least 40% of the total volume.
5. For secondary intersections combined volume of vehicles and pedestrians entering for the minor street over eight hours must be at least 25% of the total volume for a 3-way intersection or at least 35% of the total volume for a 4-way intersection.

Part Two – Warrants

1. Visibility Conditions

The minimum sight distance of the minor street driver to the major street is less than 95 meters when the major street is 50 km/h or less than 115 meters when the major street speed limit is 60 km/h or higher; and the removal of the sight obstruction is not feasible.

2. Collision History Warrant

Based on the latest three year period the intersection has met one of (a) or (b):
a) 12 or more correctable collisions for an arterial intersection or
b) 5 or more correctable collisions for all other intersections.

In general a correctable collision would include turning movement or angle type collisions as described in the collision reports.

3. Traffic Volume Warrant

An arterial intersection has a minimum vehicular traffic of 500 entering the intersection from all legs for each of any eight hours of the day and a combined vehicle and pedestrian traffic volume of 200 entering from the minor street for each of any eight hours of the day; or a secondary intersection has a minimum vehicular traffic of 200 entering the intersection from all legs for each of any eight hours of the day, and a combined vehicle and pedestrians traffic volume of 50 entering from the minor street for each of any eight hours of the day.

4. Pedestrian Exposure Warrant

An intersection is within 150 meters of a pedestrian generator such as a park, library, community facility, etc., and 50 pedestrians cross the major street in each hour:
a) For any three hours of the day if the intersection is a secondary intersection, or
b) For any six hours of the day if the intersection is on an arterial road.

5. Combination Warrant

The intersection satisfies any combination of Warrant 2, 3, 4 which are met to the extent of 80% of the stated values.

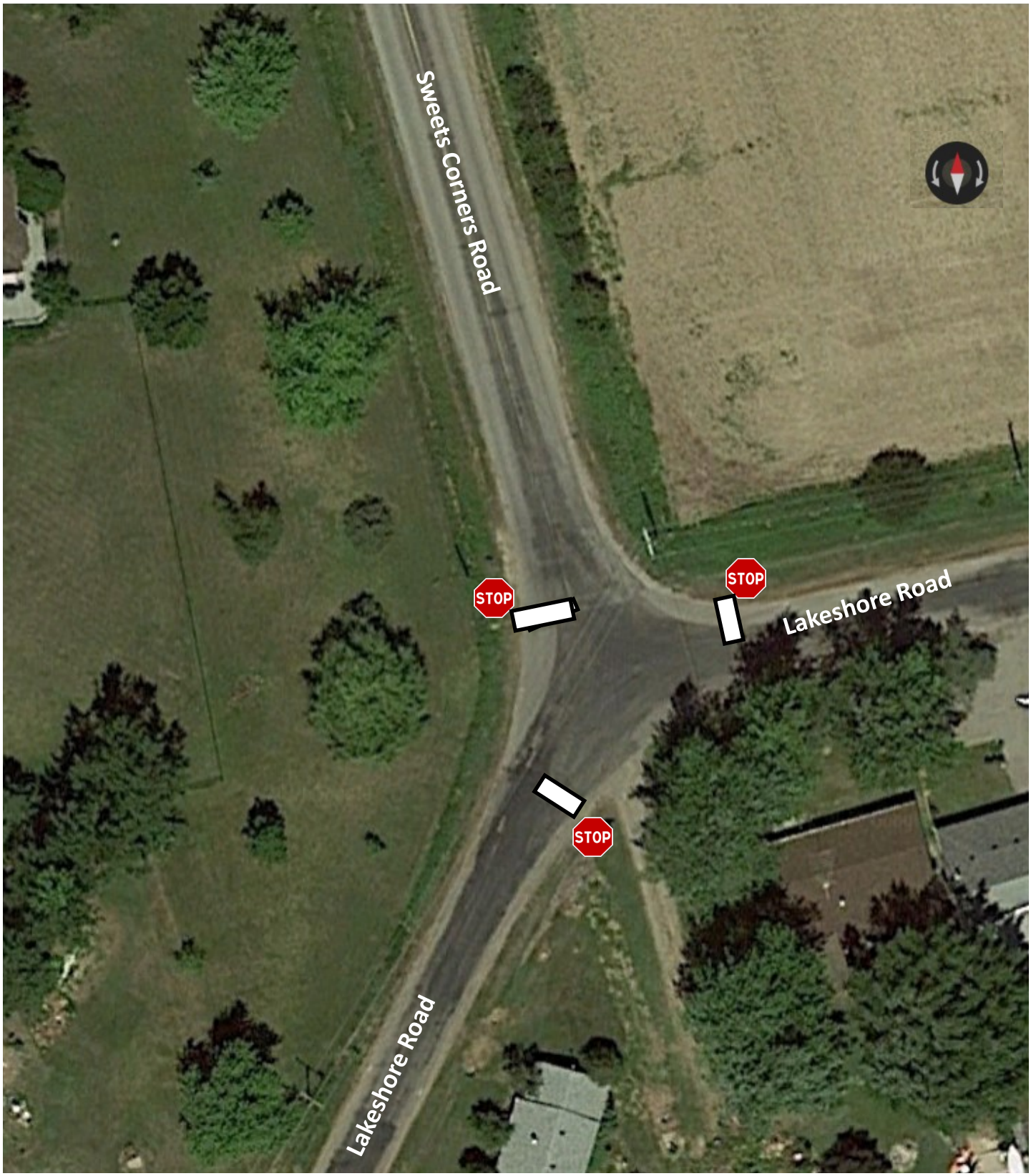
All those intersections that warrant an all way stop condition will require a report to Council for approval. For those intersections that have been considered and do not meet the warrant, a letter will be sent out to the requesting parties.

Topical Index	Physical Services
Policy Number	2007-03
Short Title	All Way Stop Installation Warrant Policy
SMT Approval Date	
Council in Committee	August 27, 2007 Recommendations 10 and 11
Council Approval Date	September 4, 2007 Resolution 877-07
Originating Department	PS-EI-06-2007
Revisions	

Sweets Corners Road and Lakeshore Road

ENG-09-2019 Attachment 3

Proposed All Way Stop Condition



HALDIMAND COUNTY

Report ENG-10-2019 Main Street North, Jarvis No Stopping Zone - Parking Control By-law Amendment

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To provide Council with a recommendation in response to a request for a no stopping zone on Main Street North (Highway 6) in front of the Tim Horton's restaurant at the north end of Jarvis.

RECOMMENDATIONS:

1. THAT Report ENG-10-2019 Main Street North, Jarvis No Stopping Zone - Parking Control By-law Amendment be received;
2. AND THAT Haldimand County Parking Control By-law 307/02, Schedule "B" No Stopping- Jarvis, be amended as outlined in Report ENG-10-2019

Prepared by: Kristopher R. Franklin, Manager, Engineering Services

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

In response to concerns raised by the public and Haldimand County Roads Operations, staff have reviewed the existing parking conditions on Main Street North in Jarvis and are recommending a no stopping zone be created to improve sightlines entering and exiting the Tim Hortons restaurant entrance.

BACKGROUND:

The Tim Hortons restaurant is located on the east side of Main Street North (Highway 6) at the north end of Jarvis (see Attachment 1). There are currently no restrictions on parking on Main Street North at this location.

Haldimand County Roads Operations staff, as well as local residents, have identified sightline issues for vehicles entering and exiting the Tim Hortons restaurant caused by trucks stopping on the east side of Main Street North in front of the restaurant.

ANALYSIS:

Staff have reviewed the existing conditions on Main Street North at the Tim Hortons restaurant and are recommending implementing a No Stopping Zone to restrict vehicles and in particular trucks, from stopping on the east side of Main Street North to access the Tim Hortons.

In recognition that trucks will continue to pull over to the side of the road, Roads Operations is planning improvements to the gravel shoulder on the east side of Main Street beyond the end of the proposed no stopping zone to provide trucks an area to safely pull off of the road without impacting sightlines for vehicles entering and exiting the Tim Hortons.

To create the No Stopping zone the following change to Haldimand County Parking Control By-law 307/02 is required:

Parking Control By-law 307/02 Schedule "B" No Stopping – Jarvis to add

Street	Side	From	To	Period
Main Street North	East	115 metres north of Boyd Street	195 metres north of Boyd Street	Anytime

FINANCIAL/LEGAL IMPLICATIONS:

Roads Operations will be responsible for installing the required signage. The estimated cost is approximately $400 and will be funded from the Road Operations regulatory/warning signage operating account.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: Yes

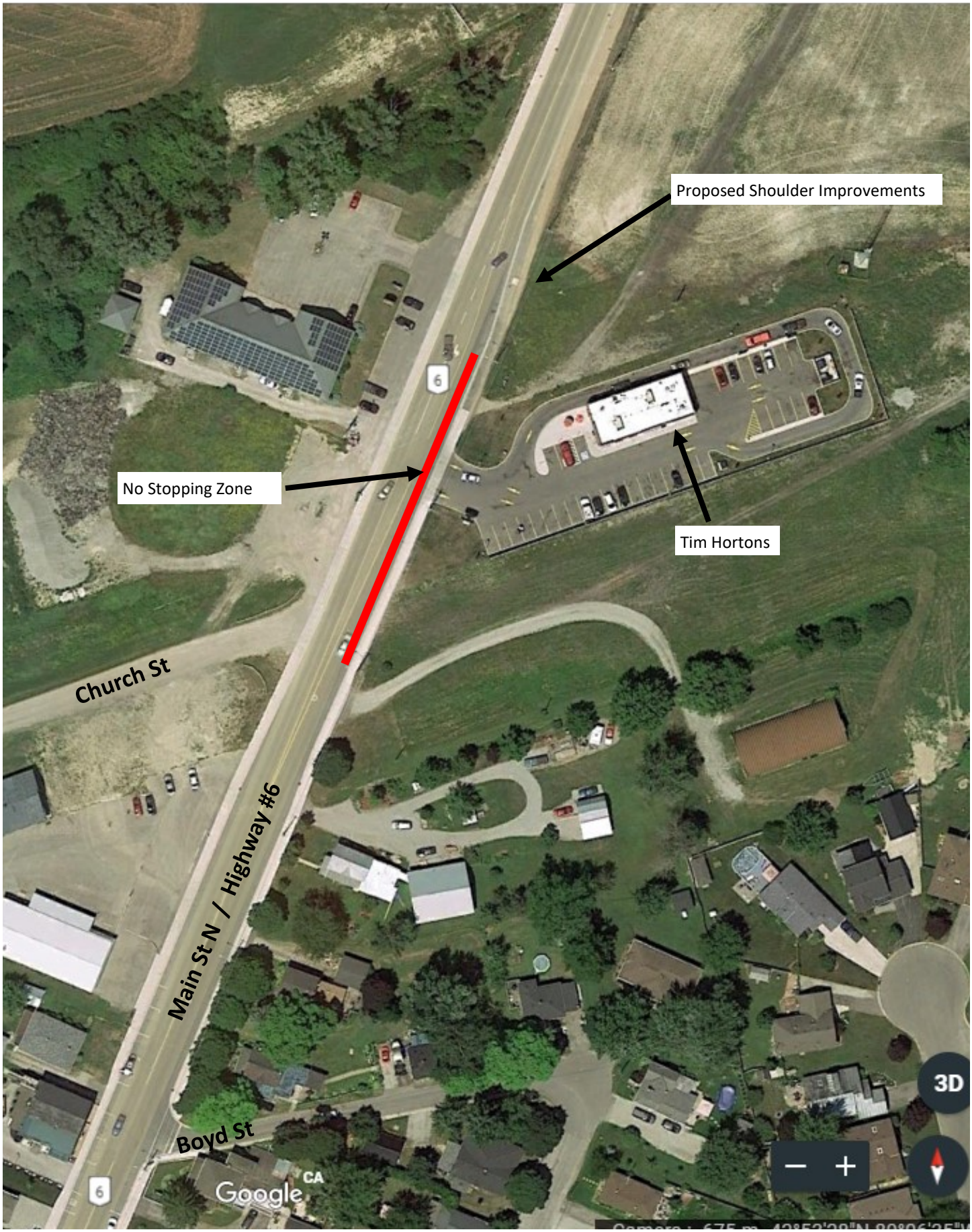
Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Proposed No Stopping Zone Main Street North, Jarvis

ENG-10-2019 Attachment 1



HALDIMAND COUNTY

Report ENG-11-2019 Budget Reallocation - Haldimand Road 3 and Haldimand Road 55 Resurfacing and Shoulder Widening

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To seek Council approval for the reallocation of capital funding for the Haldimand Road 3 and Haldimand Road 55 Resurfacing and Shoulder Widening project.

RECOMMENDATIONS:

1. THAT Report ENG-11-2019 Budget Reallocation - Haldimand Road 3 and Haldimand Road 55 Resurfacing and Shoulder Widening be received;
2. AND THAT the revised budgets as outlined in Report ENG-11-2019 be approved.

Prepared by: Kristopher R. Franklin, Manager, Engineering Services

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The Haldimand Road 3 and Haldimand Road 55 Resurfacing and Shoulder Widening project tender closed over the approved budget and requires a budget reallocation to award the project. The budget shortfalls will be funded through savings from an existing project and a reallocation from the Ward 1 Community Vibrancy Fund.

BACKGROUND:

In 2018 Haldimand County completed significant paving repairs on sections of Haldimand Road 3 from Haldimand Road 55 to Hawk Street and on Haldimand Road 55 from Concession 4 to Concession 2 Walpole.

The intent of the current project is to complete the resurfacing work started in 2018 including the sections of Haldimand Road 3 to the Norfolk boundary and Haldimand Road 55 south to Rainham Road. The 2019 work also includes shoulder widening on Haldimand Road 3 from Road 70 to Riverside Drive, culvert repair and replacements and the replacement and installation of steel beam guiderail and three cable guidewire.

In accordance with Procurement Policy 2013-02, Council must approve the reallocation of funds for a capital project with a budget shortfall of $75,000 or more (or 20% of the approved budget) or where insufficient funds are currently available.

ANALYSIS:

The Haldimand Road 3 and Haldimand Road 55 Resurfacing and Shoulder Widening tender closed on April 16, 2019 with the following three bids:

Bidder	Bid Price Received (including full HST)
Coco Paving Inc.	$1,407,980.00
Brennan Paving	$1,507,707.81
Dufferin Construction Company	$1,616,813.61

The lowest acceptable bid for the tender was received from Coco Paving Inc. in the amount of $1,340,696 (including non-rebateable HST). The total project budget is $1,190,000 or approximately $160,000 over budget. The budget deficit consists of a $100,000 shortfall in the Haldimand Road 3 and Road 55 resurfacing component and a $60,000 shortfall in the Haldimand Road 3 shoulder widening component (funded from Ward 1 CVF).

Based on the tender review staff believe that the budget shortfall of $160,000 can be attributed to the asphalt prices received which have been trending higher this year due to the demand created by some significant projects in the area including the Red Hill Creek Expressway in Hamilton and proposed MTO work on the Caledonia by-pass in the fall.

FINANCIAL/LEGAL IMPLICATIONS:

In order to fund the shortfall of $100,000 in the Haldimand Road 3 and Road 55 resurfacing staff have identified sufficient savings in the roads portion of the Alder Street project.

The Haldimand Road 3 shoulder widening is funded from Ward 1 CVF and requires a transfer from the CVF reserve account.

The following revisions to the tax supported capital budget are required to fund the project:

Project Expenditures	Current Approved Budget	Change	Proposed Revised Budget
Haldimand Road 3/55 Resurfacing (C.373.0081)	$1,000,000	$100,000	$1,100,000
Alder Street – Cedar to West (C.372.0017)	$2,014,000	($100,000)	$1,914,000
Haldimand Road 3 Shoulder Widening (C.373.0118)	$190,000	$60,000	$250,000
Total Capital Expenditures	**$3,204,000**	**$60,000**	**$3,264,000**

The related financing impacts for the projects included above, are shown below:

Project Financing	Current Approved Budget	Change	Proposed Revised Budget

CRR Roads	$3,014,000	$0	$3,014,000
Community Vibrancy Reserve Fund (Ward1)	$190,000	$60,000	$250,000
Total Financing	**$3,204,000**	**$60,000**	**$3,264,000**

Once the funding is approved, staff will proceed with the award of the tender through a purchase order.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: Yes

Policy: No

ATTACHMENTS:

1. None.

HALDIMAND COUNTY

Report LSS-19-2019 1st Quarter Insurance Loss Report - 2019

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To advise Council of insurance claims made against the County and the costs incurred for deductibles for the period January 1, 2019 to March 31, 2019.

RECOMMENDATIONS:

1. THAT Report LSS-19-2019 1st Quarter Insurance Loss Report – 2019 be received as information.

Prepared by: Dana McLean, Supervisor, Risk Management & Legal Services

Respectfully submitted: Cathy Case, General Manager of Corporate & Social Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

Activity from the first quarter of 2019 indicates a slight increase in the number of insurance claims received by the County, being 40, as compared to the first quarter of 2018 which saw 38 claims received.

Although, at times, there are incidents that are beyond the control of the County, a continued reduction in insurance claims and related expenses in all areas can be realized by placing an emphasis on reducing and managing risk and loss exposures.

BACKGROUND:

The County pays premiums to the external insurance carriers for general insurance coverage. In addition, funds are allocated annually within the County's budget for the self-insurance program. The self-insurance program is designed to cover the costs of investigation, defence and settlement of all claims falling below the deductible levels, as well as paying the respective deductibles to the insurer on all claims exceeding these levels.

For 2019, as with previous years, the County has been subject to varying levels of deductibles for general insurance coverage, depending on the coverage area. The municipal liability coverage carries a deductible of $250,000; the property insurance deductible is $50,000; and the auto insurance deductible is $25,000. All deductibles are applicable on a per occurrence basis.

This report does not reflect the total value of insurance claims that exceed the County's deductible levels. The settlement costs, over and above the County's deductibles, are incurred directly by the insurance companies and are reflected back in the insurer's annual premium rates based on the County's historical claims experience.

The last quarterly report presented to Council, regarding the self insurance portion of the County's insurance program, covered the period of October 1, 2018 to December 31, 2018 (Report LSS-15-

2019). This report represents the first quarter of 2019's claims experience, as well as a comparison to the full year of 2018.

ANALYSIS:

The attached schedule (Attachment #1) depicts the 40 claims that were received in the first quarter of 2019. Of the claims received during this quarter, 20 remain outstanding as they are under investigation by staff or the County's adjuster. Attachments #2, #3, #4, #5 and #6 provide a further breakdown by the category of the claims received and the costs incurred.

The claims received in the automotive area amount to 25 for the first quarter. Eleven claims arose out of snowplowing activities including minor damage to a parked vehicle and minor damage to a snow plow vehicle from a low hanging tree branch at the side of the roadway. One incident involved a County ambulance becoming stuck in a snowdrift on a curve in the roadway on Southcoast Drive resulting in towing costs being incurred.

The property area of coverage saw 6 claims incurred, with 5 of the claims involving damage to County property due to the actions of third parties. Three of these claims will be subrogated by the County to attempt recovery of expenses from the known third parties to rectify the damage.

Nine (9) liability claims were received in the first quarter of 2019, including 5 claims resulting from County trees or tree branches falling. Of the 9 liability claims received, 7 remain outstanding and are being investigated.

During the first quarter, the County incurred insurance settlement costs of $31,740.51 per Attachment #6. The settlement costs and expenses realized in a quarter do not necessarily represent the full cost of claims submitted during that quarter. Costs pertaining to claims from previous quarters, and even years prior, can be incurred at any time upon resolution or through continued negotiation and litigation. The costs incurred for the first quarter were in large part, to repair County vehicles which had sustained damage. In addition, approximately $12,000 was paid to the County's external insurer for the resolution of claims being administered through the litigation process.

In an effort to reduce the incidence of claims and subsequently costs, various risk management measures are taken. Incidents involving County vehicles or equipment are reviewed by the Vehicle Accident Review Committee on a monthly basis. Recommendations are made by the Committee to the applicable Manager and Supervisor to reduce the likelihood of recurrence of such incidents. Managers are kept aware of liability claims that are received and the outcomes of those claims. This information is used to assess the necessity of implementing measures to mitigate against future claims and/or losses.

With regard to subrogation, the County has followed the approach of attempting recovery for costs incurred due to vandalism or for damage to County property as a result of certain motor vehicle accidents. Where the identity of the responsible party for the claim/damage can be proven, staff subrogate against the third party in an attempt to recover the County's costs. Attachment #5 outlines the costs that have been incurred and recoveries achieved in the 1st quarter of 2019. Note that these amounts will be over and above the claims costs reported in Attachment #6 and represent an additional expense to the County if recovery is not achieved. Due to the timing of the recovery invoices, receipt of payment is often not reflected in the same quarter that the claims costs are incurred. As noted, the costs reported in Attachment #5 are in addition to the County's expenses outlined in Attachment #6.

FINANCIAL/LEGAL IMPLICATIONS:

The 2019 budget for insurance claim costs and deductibles (both internal and external) was established at $400,000. The costs of the self insurance program reflect that, at the end of the first quarter, $31,740 or 8% of this budget has been expended. This does not include any allowance for outstanding/unresolved claims or reserves that have been established by the insurer for larger claims. It also excludes approximately $2,800 in costs related to claims for which reimbursement through subrogation is being sought.

The County's Insurance Reserve is used to fund the costs incurred in settling claims administered internally as well as payment of deductibles. This source of funding avoids significant negative variances affecting the annual operating budget due to unusual and costly events, which are typically not expected as part of day-to-day business. Without such a source of funding, there would be major fluctuations in the annual expenditures incurred within the various operating divisions, as well as challenges in defining, monitoring and managing "normal" operations. The Self Insurance Reserve has an unaudited balance of approximately $1.62 million as at the end of 2018. This balance reflects an accrual for outstanding claims currently in litigation or under investigation totalling just in excess of $617,000.

STAKEHOLDER IMPACTS:

All Managers are provided with the details of the insurance claims filed against the County in order that appropriate risk mitigation steps can be taken to prevent future incidents of a similar nature, where possible.

REPORT IMPACTS:

Agreement: No

By-law: No

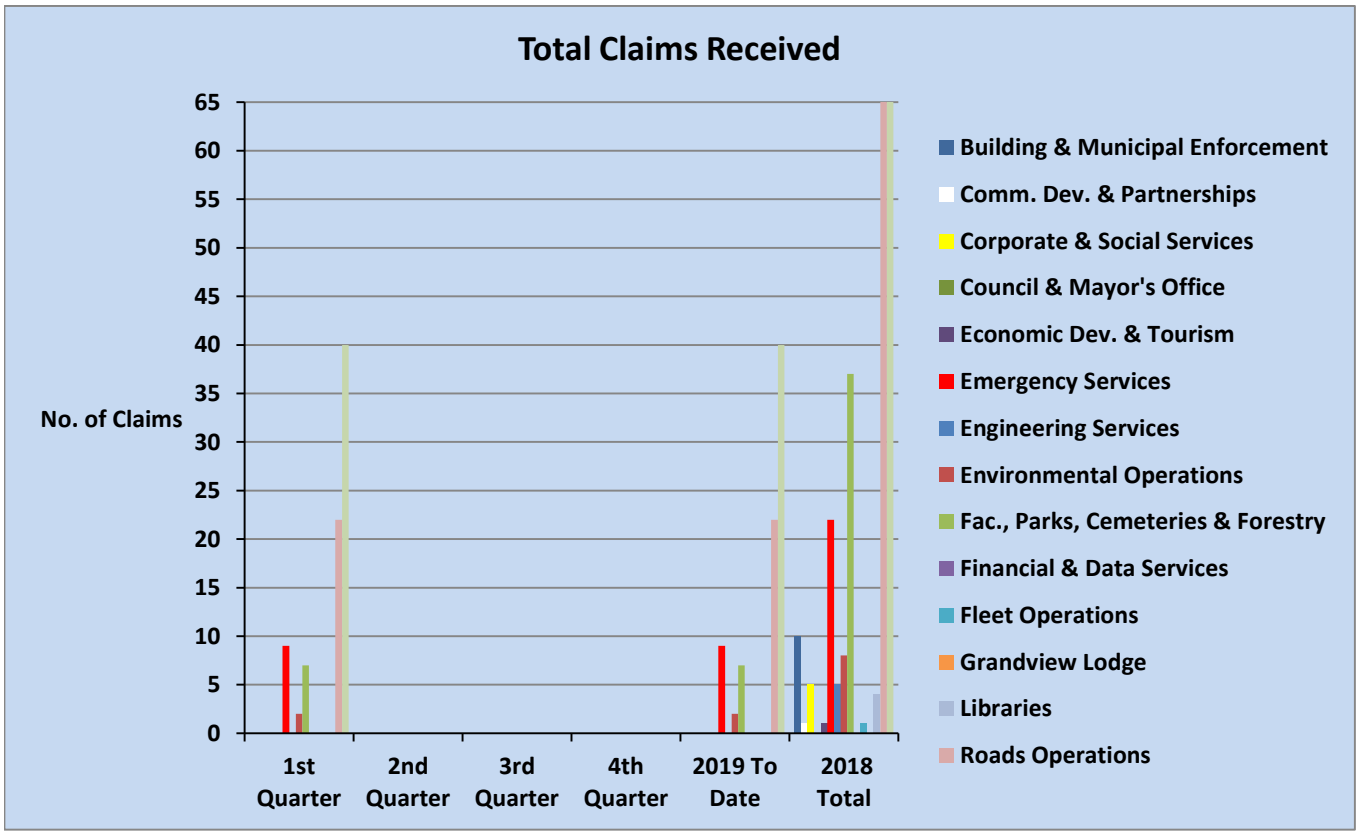
Budget Amendment: No

Policy: No

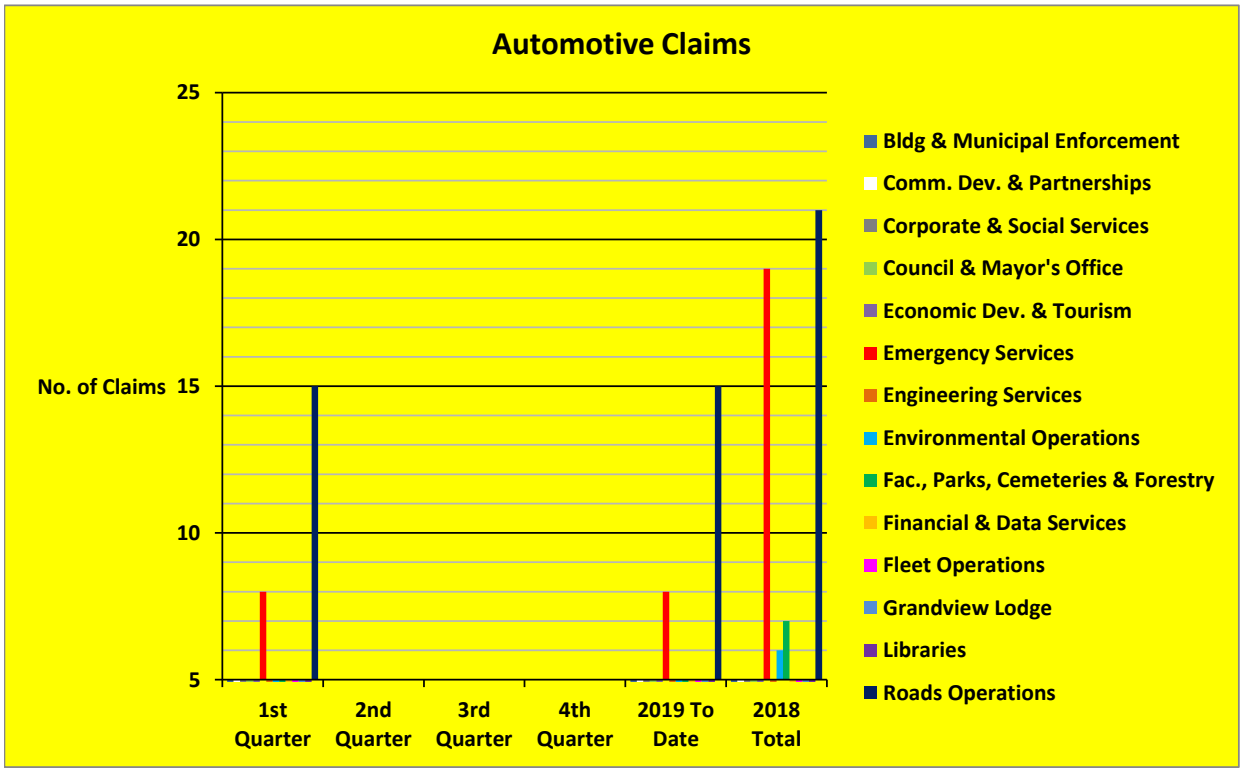
ATTACHMENTS:

1. 2019 Insurance Loss Experience - Total Claims Received.
2. 2019 Insurance Loss Experience - Total Automotive Claims Received.
3. 2019 Insurance Loss Experience - Total Property Claims Received.
4. 2019 Insurance Loss Experience - Total Liability Claims Received.
5. 2019 Subrogation Chart – Costs Incurred/Recovery Achieved.
6. 2019 Insurance Loss Experience - Settlement Costs

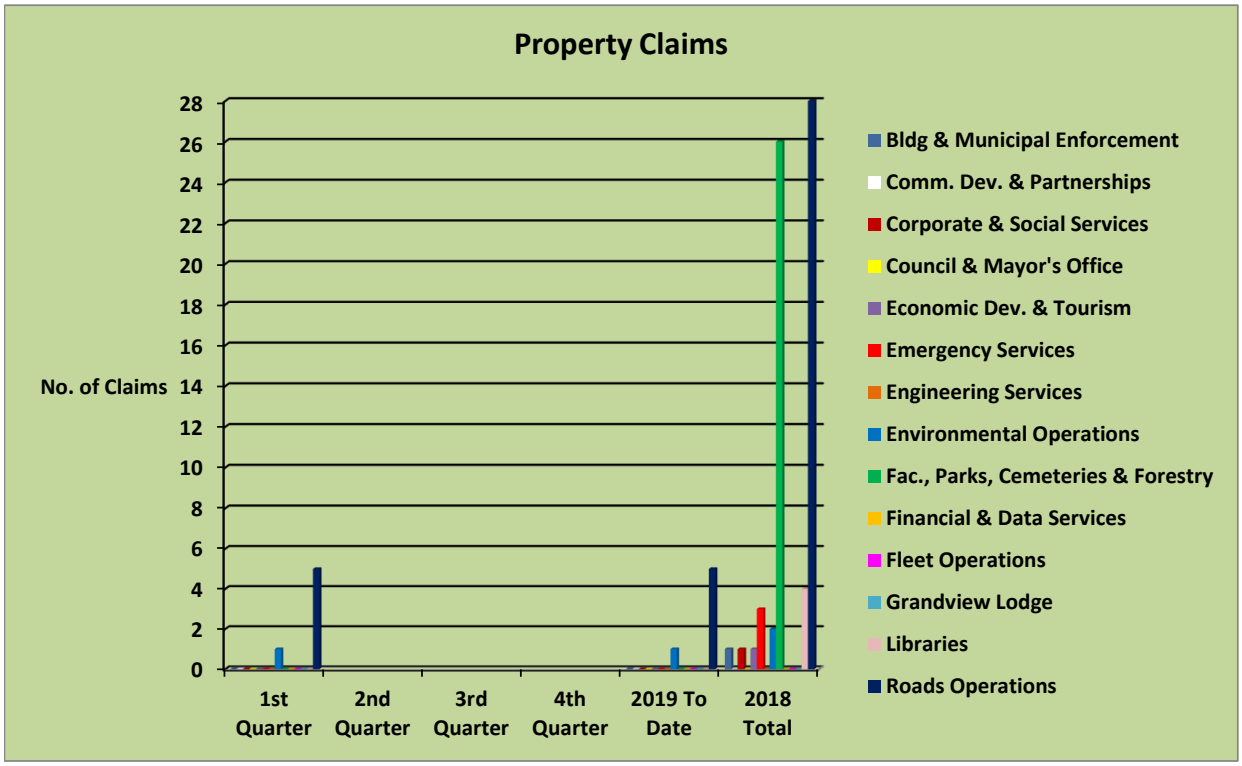
Haldimand County						
2019 Insurance Loss Experience - Total Number of Claims Received						
Dept./Division Affected	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**	**2019 To Date**	**2018 Total**
Building & Municipal Enforcement	0				0	10
Comm. Dev. & Partnerships	0				0	1
Corporate & Social Services	0				0	5
Council & Mayor's Office	0				0	0
Economic Dev. & Tourism	0				0	1
Emergency Services	9				9	22
Engineering Services	0				0	5
Environmental Operations	2				2	8
Fac., Parks, Cemeteries & Forestry	7				7	37
Financial & Data Services	0				0	0
Fleet Operations	0				0	1
Grandview Lodge	0				0	0
Libraries	0				0	4
Roads Operations	22				22	71
Total	**40**	**0**	**0**	**0**	**40**	**165**



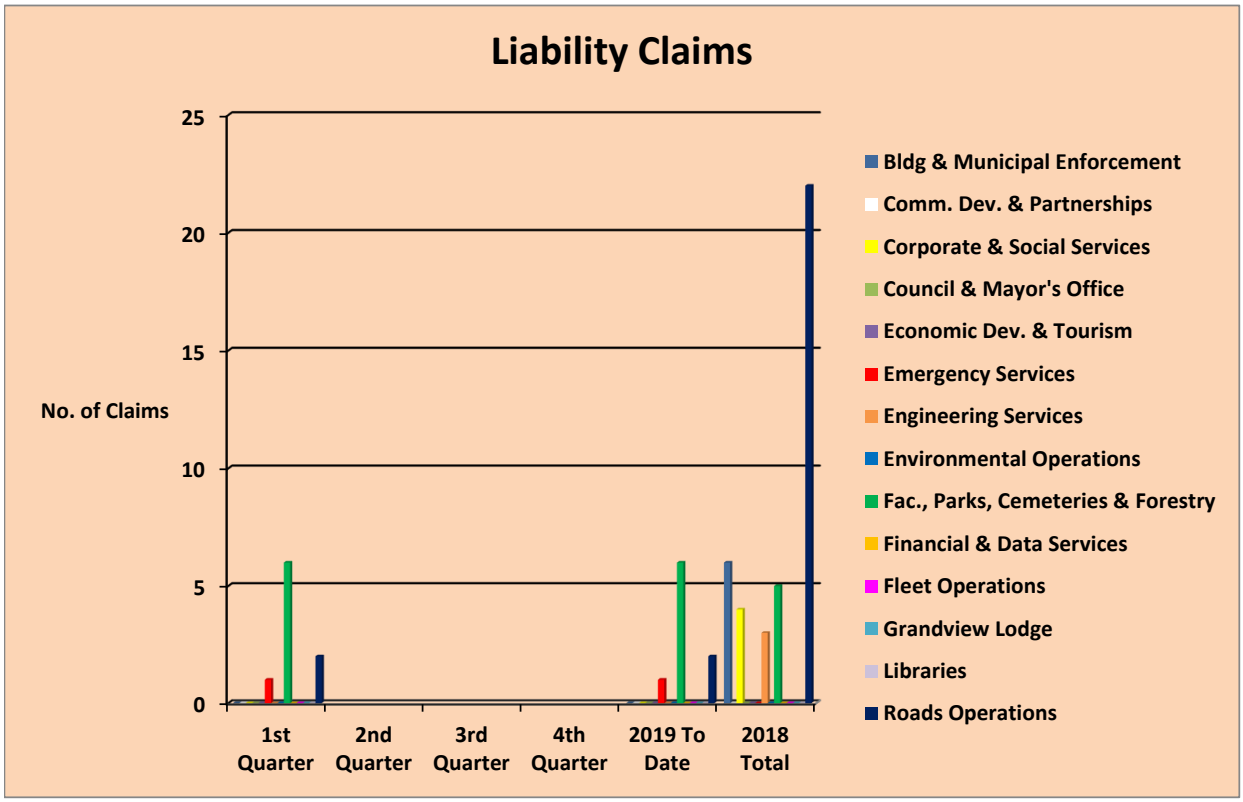
Haldimand County						
2019 Insurance Loss Experience - Total Number of Claims Received - Automotive						
Dept./Division Affected	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**	**2019 To Date**	**2018 Total**
Bldg & Municipal Enforcement	0				0	3
Comm. Dev. & Partnerships	0				0	0
Corporate & Social Services	0				0	0
Council & Mayor's Office	0				0	0
Economic Dev. & Tourism	0				0	0
Emergency Services	8				8	19
Engineering Services	0				0	2
Environmental Operations	1				1	6
Fac., Parks, Cemeteries & Forestry	1				1	7
Financial & Data Services	0				0	0
Fleet Operations	0				0	1
Grandview Lodge	0				0	0
Libraries	0				0	0
Roads Operations	15				15	21
Total	**25**	**0**	**0**	**0**	**25**	**59**



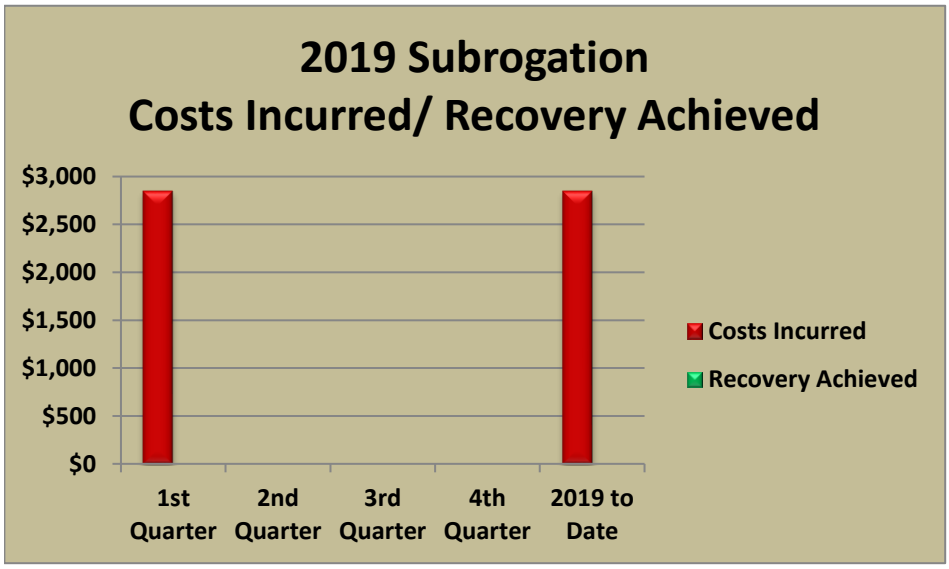
Haldimand County						
2019 Insurance Loss Experience - Total Number of Claims Received - Property						
Dept./Division Affected	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	2019 To Date	2018 Total
Bldg & Municipal Enforcement	0				0	1
Comm. Dev. & Partnerships	0				0	0
Corporate & Social Services	0				0	1
Council & Mayor's Office	0				0	0
Economic Dev. & Tourism	0				0	1
Emergency Services	0				0	3
Engineering Services	0				0	0
Environmental Operations	1				1	2
Fac., Parks, Cemeteries & Forestry	0				0	26
Financial & Data Services	0				0	0
Fleet Operations	0				0	0
Grandview Lodge	0				0	0
Libraries	0				0	4
Roads Operations	5				5	28
Total	**6**	**0**	**0**	**0**	**6**	**66**



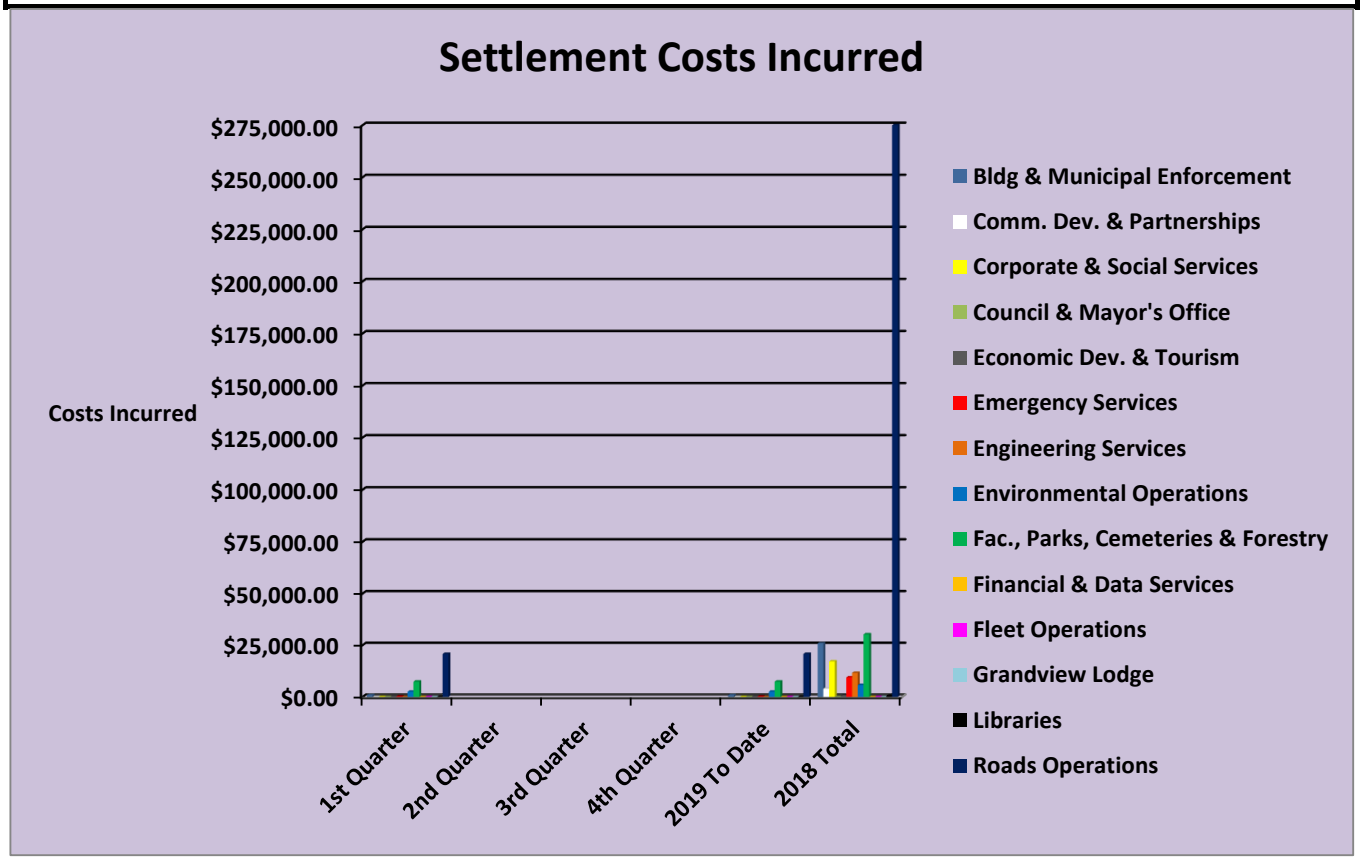
Haldimand County						
2019 Insurance Loss Experience - Total Number of Claims Received - Liability						
Dept./Division Affected	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	2019 To Date	2018 Total
Bldg & Municipal Enforcement	0				0	6
Comm. Dev. & Partnerships	0				0	0
Corporate & Social Services	0				0	4
Council & Mayor's Office	0				0	0
Economic Dev. & Tourism	0				0	0
Emergency Services	1				1	0
Engineering Services	0				0	3
Environmental Operations	0				0	0
Fac., Parks, Cemeteries & Forestry	6				6	5
Financial & Data Services	0				0	0
Fleet Operations	0				0	0
Grandview Lodge	0				0	0
Libraries	0				0	0
Roads Operations	2				2	22
Total	**9**	**0**	**0**	**0**	**9**	**40**



Haldimand County		
2019 Subrogation - Costs Incurred/Recovery Achieved		
Quarter	**Costs Incurred**	**Recovery Achieved**
1st Quarter	$2,849.28	$0.00
2nd Quarter	$0.00	$0.00
3rd Quarter	$0.00	$0.00
4th Quarter	$0.00	$0.00
2019 to Date	**$2,849.28**	**$0.00**



Haldimand County						
2019 Insurance Loss Experience - Settlement Costs Incurred						
Dept./Division Affected	**1st Quarter**	**2nd Quarter**	**3rd Quarter**	**4th Quarter**	**2019 To Date**	**2018 Total**
Bldg & Municipal Enforcement	$863.94				$863.94	$25,927.65
Comm. Dev. & Partnerships	$0.00				$0.00	$3,975.93
Corporate & Social Services	$0.00				$0.00	$17,165.11
Council & Mayor's Office	$0.00				$0.00	$0.00
Economic Dev. & Tourism	$0.00				$0.00	$405.00
Emergency Services	$101.76				$101.76	$9,444.53
Engineering Services	$0.00				$0.00	$11,609.10
Environmental Operations	$2,558.25				$2,558.25	$5,754.37
Fac., Parks, Cemeteries & Forestry	$7,390.96				$7,390.96	$30,271.54
Financial & Data Services	$0.00				$0.00	$0.00
Fleet Operations	$0.00				$0.00	$0.00
Grandview Lodge	$0.00				$0.00	$0.00
Libraries	$0.00				$0.00	$432.48
Roads Operations	$20,825.60				$20,825.60	$463,434.09
Total	**$31,740.51**	**$0.00**	**$0.00**	**$0.00**	**$31,740.51**	**$568,419.80**



HALDIMAND COUNTY

Report PDD-23-2019 Removal of a Holding (H) Provision – Morris and Cucuz

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To request Council's approval to remove a historical holding (H) provision from a parcel of land that has been purchased from Georgia Pacific by private property owners in order for a single family dwelling to be constructed.

RECOMMENDATIONS:

1. THAT Report PDD-23-2019 Removal of a Holding (H) Provision – Morris and Cucuz be received;
2. AND THAT the attached by-law for the removal of a holding (H) provision be presented for enactment;
3. AND THAT the proposal is deemed to be consistent with the Provincial Policy Statement 2014 and the Provincial Growth Plan 2019 and other matters of provincial interest.

Prepared by: Meagan Ferris, BES, MCIP, RPP, Planner

Reviewed by: Mike Evers, BES, MCIP, RPP, Director of Planning and Development Division

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The subject lands, which are currently vacant of any structures, had a holding (H) provision put in place back in 1989. This holding provision is associated with the past zoning amendment on the property to facilitate a gypsum mining operation. At that time the holding provision was required to ensure no development, in relation to the operation, occurred until such time that a development agreement and site plan were completed in relation to the proposed construction of an office and change room facility; electrical substation; man access shaft; ventilation shaft and parking area associated with the mining use. This proposal never materialized and these lands have since been sold by Georgia Pacific to the current, private owners – Brian Morris and Mirjana Cucuz. The intent of the current property owners is to construct a single family dwelling, which is a permitted use within the current zoning by-law. Planning staff are of the opinion that it is appropriate to support the removal of the holding provision as the ownership has changed and the use requiring the holding is no longer intended to be constructed; therefore, the holding is no longer required. Planning staff are further of the opinion that this proposal maintains the intent and purpose of provincial and local policy, as a dwelling is permitted as of right.

BACKGROUND:

The subject lands are located on the north side of Abbey Road with access gained via an existing driveway that also services a landlocked parcel located behind the subject lands. The subject lands are currently vacant of any structures and do not have a municipal address.

The historical holding provision was put in place in 1989. The subject lands, which until recently were owned by Georgia Pacific, were rezoned via By-law 8-H-89 which established a site specific zone provision (36.24) that adds additional uses and site specific requirements in relation to the intended use (at the time). The intended use at the time was in relation to a mining operation. The site specific provision allows, in addition to the uses permitted in the 'Agriculture (A)' zone, an office and change room facility; electrical substation; man access shaft; ventilation shaft and parking area. The site specific provision also establishes a minimum lot area, frontage, front yard and side yard setbacks, etc., all of which were intended to buffer and control how the intended use would be developed in relation to adjacent properties. In addition to the holding provision being put in place, the subject lands were also placed under site plan control via By-law 9-H-89, to allow the municipality to review the future development of the site in relation to the potential mining operation. The intended use never was established, however the regulatory controls remain in place.

Since that time, the subject lands have changed ownership as Georgia Pacific has identified that they do not have an intent to mine the property. The subject lands are now owned by Brian Morris and Mirjana Cucuz, and the new owners' intent is to construct a single family dwelling. Staff also notes that the property owners have provided confirmation that the subject lands have not been undermined, as per Ministry of Northern Development & Mines mapping. The applicants have also submitted a request to the County to remove the unique site specific provision on the site (so permitted uses are limited to what is permitted in the 'A' Zone) via the comprehensive zoning by-law process. Staff will address that request as a housekeeping item as part of the new County By-law. Lastly, the new owners have also submitted a consent application to establish an easement over the historical driveway utilized to access the subject lands and the lands known municipally as 333 Abbey Road. This will ensure the adjacent property at 333 Abbey Road continues to have legal access. With all of this said, the intent of this application is to remove the holding (H) provision only to facilitate construction of a dwelling.

ANALYSIS:

Planning staff have reviewed this proposal and are satisfied that the future development of this site and the removal of the holding (H) provision is appropriate and consistent with all levels of Provincial and local policy. The holding was specifically put in place due to the previous intended use (i.e. uses to support an mining operation); however, these uses are no longer intended to occur and Georgia Pacific has sold the subject lands. By removing the holding, this will allow the new owners to construct a dwelling, which is permitted within the Agriculture designation and permitted as of right in the current Agriculture zoning. Staff also notes that the development of a single family dwelling is not subject to site plan control and does not typically require a development agreement (unless unique circumstances such as on partial municipal services). Based on this, Planning staff are satisfied that the removal of the holding (H) provision is appropriate.

Notice Requirements:

The *Planning Act* only requires public notice to be given to those individuals or groups that have given the Clerk of the municipality a written request for notice of the intention to pass an amending by-law to remove a holding (H) provision from a zoning by-law under subsection 36(4) of the *Act*. Due to the antiquity of this by-law, it is not known that there are any individuals that have provided a written request as to whether the holding is to be removed. With that in mind, and the fact that the holding is being

removed to facilitate the development of a dwelling, which is a less intensive use, public notice is not required.

FINANCIAL/LEGAL IMPLICATIONS:

Not applicable.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Draft Holding (H) Removal By-law.

PDD-23-2019, Attachment 1

THE CORPORATION OF HALDIMAND COUNTY

By-law Number /19

Being a by-law to amend Zoning By-law 1-H 86, as amended, of the Town of Haldimand in the name of Brian Morris and Mirjana Cucuz ('Holding – 'H' provision removal).

WHEREAS Haldimand County is empowered to enact this by-law, by virtue of provisions of Section 34 and 36 of the Planning Act, R.S.O. 1990, Chapter P.13, as amended;

WHEREAS this by-law conforms to the Haldimand County Official Plan;

NOW THEREFORE, the Council of The Corporation of Haldimand County enacts as follows:

1. **THAT** this by-law shall apply to the lands described as PART RIVER LOT 21 LYING NORTH OF RAILWAY, PART LOT 20 FRONT CON ONGRAND RIVER LYING NORTH OF RAILWAY PT 1 18R1548; HALDIMAND COUNTY and being as shown on Maps 'A' and 'B; attached hereto to form a part of this by-law.

2. **THAT** Schedule "A1" to the Zoning By-law 1-H 86 of the Town of Haldimand, as amended, is hereby further amended by removing the "Holding – H" symbol from the lands being as shown on Maps 'A' ad 'B' attached hereto to form a part of this by-law.

3. **AND THAT** this by-law shall take force and take effect on the date of passing.

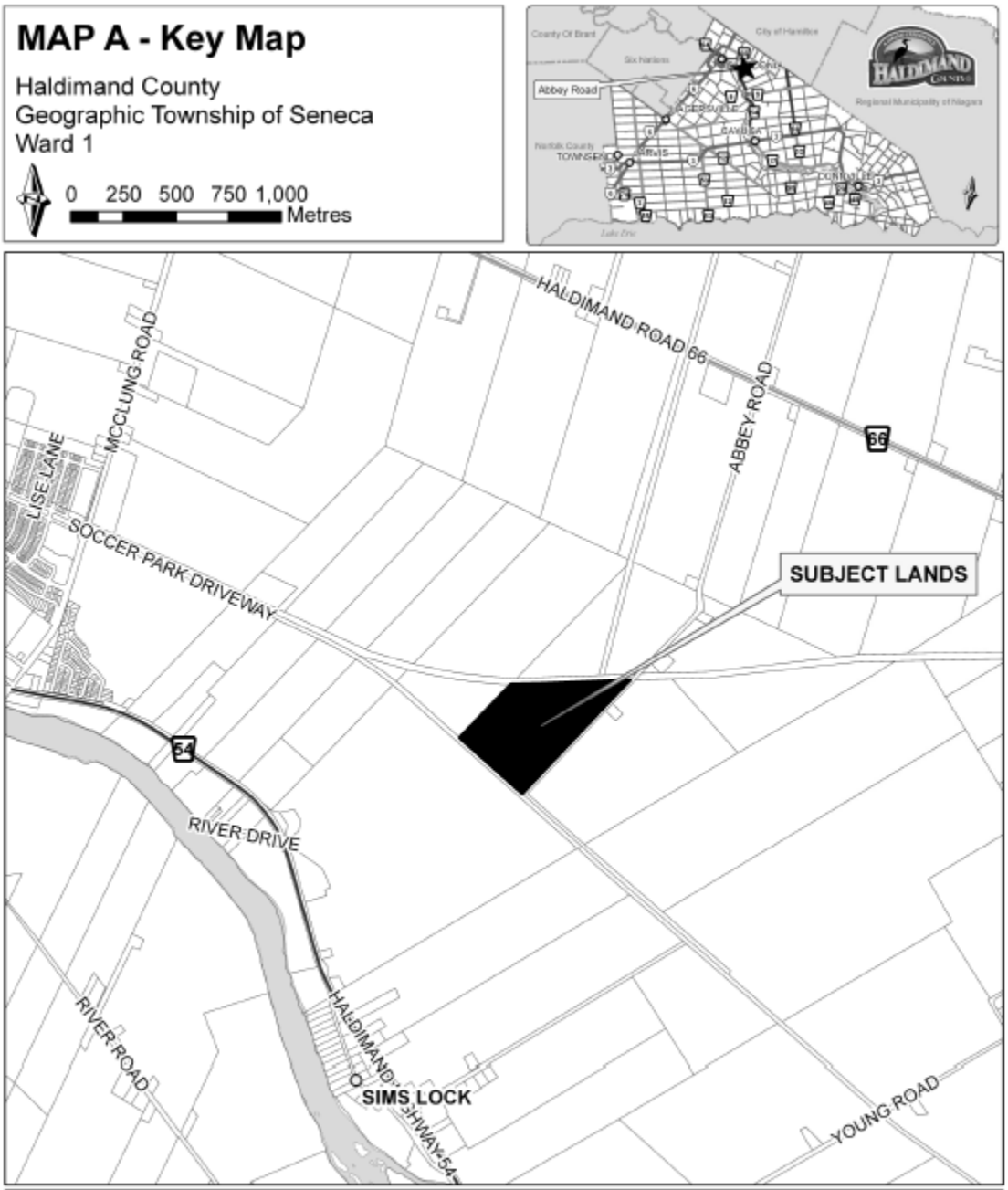
READ a first and second time this 24th day of June, 2019.

READ a third time and finally passed this 24th day of June, 2019.

_____
MAYOR

_____
CLERK

Schedule "A"



This is Map A to Zoning By-law _____ Passed the ____ day of _____ 2019.

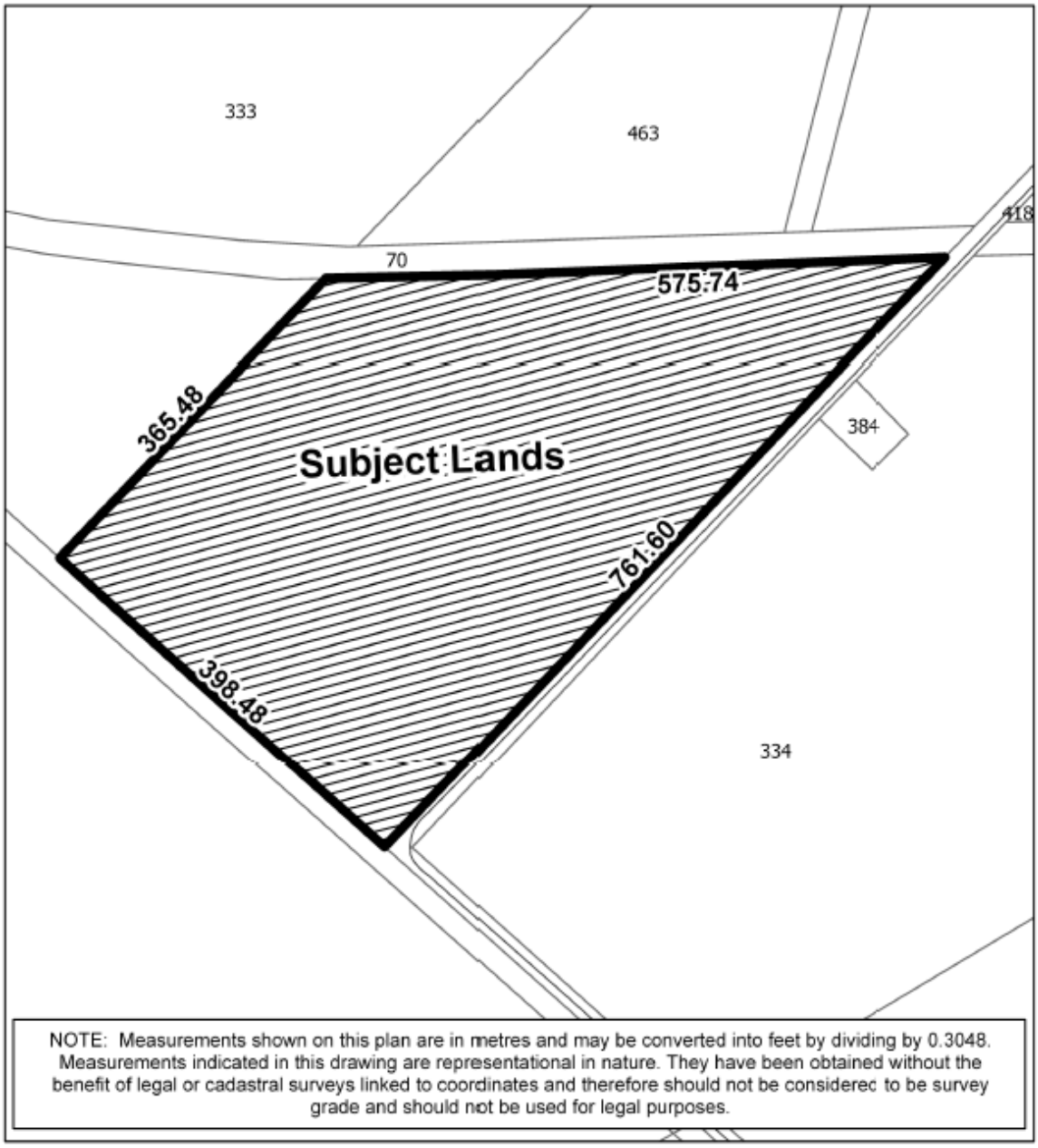
MAYOR CLERK

Ref: 8-H-89

MAP B - Detail Map

Haldimand County
Geographic Township of Seneca, Ward 1

SCALE: 1:5,000
0 25 50 75 100 Metres



NOTE: Measurements shown on this plan are in metres and may be converted into feet by dividing by 0.3048. Measurements indicated in this drawing are representational in nature. They have been obtained without the benefit of legal or cadastral surveys linked to coordinates and therefore should not be considerec to be survey grade and should not be used for legal purposes.

This is Map B to Zoning By-law _____ Passed the ____ day of _____ 2019.

MAYOR CLERK

Ref: 8-H-89

PURPOSE AND EFFECT OF BY-LAW NO.

This by-law affects lands located on Abbey Road, with no affixed address, and legally described as PART RIVER LOT 21 LYING NORTH OF RAILWAY, PART LOT 20 FRONT CON ONGRAND RIVER LYING NORTH OF RAILWAY PT 1 18R1548; HALDIMAND COUNTY and shown on the attached maps.

The purpose of this by-law is to remove a 'Holding – "H" provision from the 'Agriculture (A)' Zone put in place in 1989 on the subject lands. The holding provision was put in place to ensure that a development agreement and site plan were entered in to with regards to the development of an office and change room facility; electrical substation; man access shaft; ventilation shaft; and parking area associated with a future mining operation.

The basis of the removal of the "H" is that the subject lands have been sold by Georgia Pacific and the current owners' intent is to construct a single family dwelling. The current owners are also pursuing the remove the site specific zone provision which allows the aforementioned uses, in addition to the uses in the 'Agriculture (A)' Zone. The removal of the holding will facilitate the construction of a single family dwelling.

The subject lands are designated as Agriculture within the Haldimand County Official Plan.

File No.:	N/A
Report No.:	PDD-23-2019
Related File No.:	Z-HA6/84
Related Report No.:	17/89
Roll No.:	2810-152-003-148500000
Name:	Brian Morris and Mirjana Cucuz

HALDIMAND COUNTY

Report PDD-24-2019 Final Updated Growth Plan and Bill 108

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To provide Council with information on the updated Growth Plan and Bill 108 - "More Homes, More Choice – Ontario's Housing Supply Action Plan" ("Action Plan) and make recommendations relating to comments to be provided to the Province.

RECOMMENDATIONS:

1. THAT Report PDD-24-2019 Final Updated Growth Plan and Bill 108 be received;
2. AND THAT the following concerns be submitted to the Province:
    i. Request the Province to consult with Ontario municipalities prior to issuing any draft regulations associated with proposed Bill 108 such that municipalities can fully understand and be able to analyze the impact of the proposed Bill changes comprehensively, including the cumulative financial impacts to municipalities;
    ii. Request the Province to enshrine revenue neutrality in the proposed legislation and if not, create a municipal compensation fund to support municipalities whose revenues decline under the proposed community benefit charge regime; and
    iii. Request the Province to provide a transparent and thorough stakeholder consultation process in the development of all regulations associated with proposed Bill 108.
3. AND THAT a copy of Report PDD-24-2019 be provided to MPP Toby Barrett and the Ontario Minister of Municipal Affairs and Housing;
4. AND THAT the Chief Financial Officer and Treasurer report back to Council as part of the 2020 budget process on any impacts on growth-related or other capital expenditures resulting from the enactment of the proposed Bill 108.

Prepared by: Mike Evers, MCIP, RPP, BES, Director of Planning & Development

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019 came into effect on May 16, 2019 and Bill 108, *More Homes, More Choice Act*, 2019 was passed into legislation on June 6, 2019. The updated Growth Plan is consistent with the proposed changes the Province put forwards (and which staff reviewed/commented on) earlier in the year. The changes will be worked through and incorporated into the County's new Official Plan as the update of that instrument moves forward. The updates are generally supported by staff and represent a series of changes that allow flexibility and recognize regional differences in growth demand and patterns across the Greater Golden Horseshoe.

Bill 108 introduces a series of planning process changes that are generally supported by staff; however, it also introduces significant changes to how/what Development Charges can be applied. It appears these changes will have the effect of decreasing the value of the Development Charges municipalities receive while at the same time, increase the municipal administrative burden. The true financial impacts of this tool, and the County's ability to recover soft service costs and parkland will be unknown until the key details (regulations and transitions) are released. Staff are of the opinion that Bill 108 will impact the County's financial strategy for its 10-year capital plan which supports critical infrastructure investments, including: library expansion and renovation projects; a new emergency service station, new or expanded parks and playgrounds; and a new recreation centre to support population growth. In addition, these changes will impact the ability to implement existing approved financing plans for recent major capital works (arenas, libraries and emergency service facilities) where the County anticipated the ability to recover future Development Charges to fund the debt payments for these facilities.

BACKGROUND:

A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019 ("Plan") came into effect on May 16, 2019. It replaces the 2017 Growth Plan and is part of the Province's "More Homes, More Choice: Housing Supply Action Plan". The Plan contains a series of significant amendments that were overviewed by staff in PDD-M01-2019 as part of the April 16, 2019 Council in Committee meeting. The Plan closely tracks the proposed amendments first announced by the Province in January 2019. The main change, mapping relating to provincially significant employment zones (i.e. for Lake Erie Industrial Park), is in line with the request of the County for said mapping to be expanded and is examined in the Analysis section of this report.

On May 2, 2019, the Province of Ontario unveiled "More Homes, More Choice – Ontario's Housing Supply Action Plan" ("Action Plan"). This Action Plan includes proposed amendments to several pieces of legislation that affect the planning process in Ontario via Bill 108, the *More Homes, More Choice Act*. The *More Homes, More Choice Act* was passed and received Royal Assent on June 6th, 5 days after the Environmental Bill of Rights (EBR) posting closed (June 1st). The Province did not make any changes to the legislation as a results of the EBR posting/commenting period. The report focuses on the key amendments to the *Planning Act, Development Charges Act* and *Heritage Act* which are of significance to Haldimand County and makes recommendations for Council to consider in terms of response to the Province.

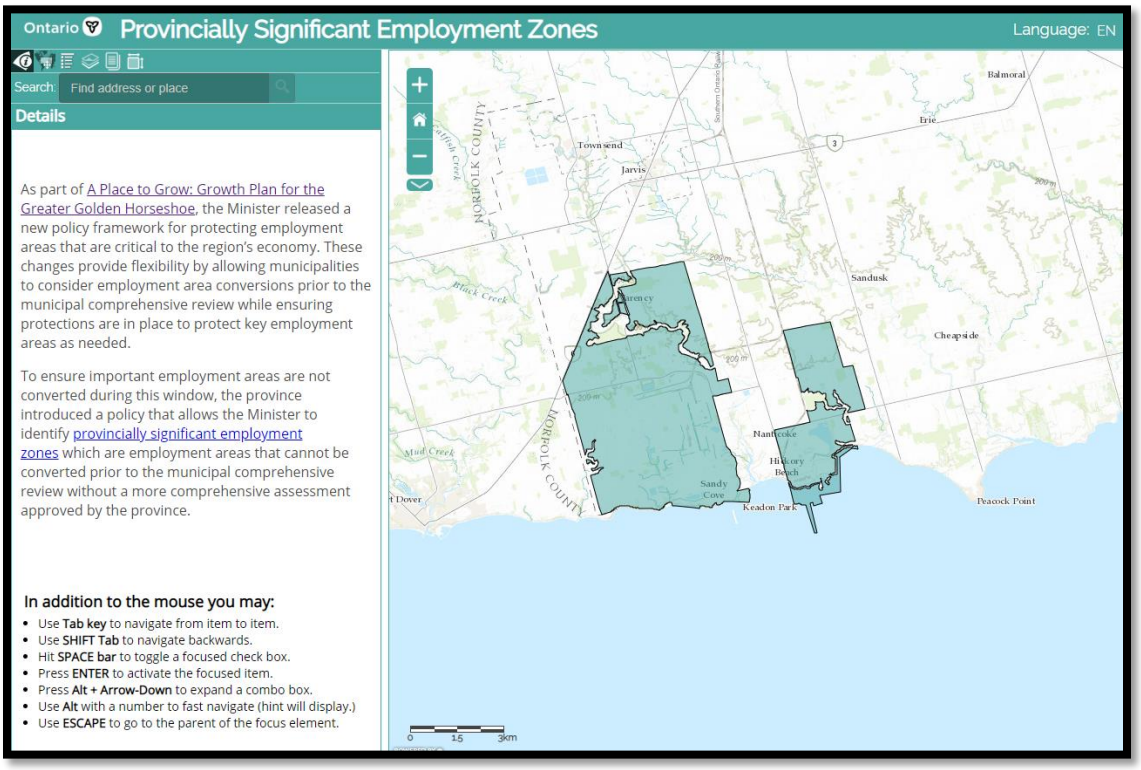
ANALYSIS:

Updated Growth Plan – "A Place to Grow"

A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019 ("Plan") came into effect on May 16, 2019. It replaces the 2017 Growth Plan and is part of the Province's "More Homes, More Choice: Housing Supply Action Plan".

The Province first announced the proposed amendments on January 15, 2019. The amendments were summarized by staff in previous memo PDD-M01-2019 Proposed Growth Plan Amendment Number 1 which was presented at the April 16, 2019 Council in Committee meeting. After undergoing a 45-day commenting and review period, the majority of the proposed amendments have been incorporated into the Plan as they were initially drafted. Significantly, however, the new Plan introduces for the first time a definition of *provincially significant employment zones (PSEZ)* that can consist of *employment areas* or mixed-use areas that maintain a significant number of jobs. The County raised concerns that the extent of the PSEZ initially proposed for the Lake Erie Industrial Park (LEIP) was much smaller than is shown in the County Official Plan. The Province has responded favourably to the County's request to

extend the mapped area to cover all of the designated/zoned employment lands within the LEIP to correspond to the County's Official Plan. A snapshot of the defined lands from the Province's mapping portal is included below.



Growth Plan Transition Matters:

As noted above, the revised Growth Plan is now in effect. The proposed transition regulation requires all planning decisions to conform to the new Plan moving forward. The requirement for municipalities to update their Official Plans to conform to the new Plan by July 1, 2022 is unchanged from the 2017 Growth Plan. The County has initiated its update to its Official Plan and expects to be able to achieve this timeframe.

Bill 108 – Housing Supply Action Plan Legislation

On May 2, 2019, the Province of Ontario unveiled "More Homes, More Choice – Ontario's Housing Supply Action Plan" ("Action Plan"). This Action Plan includes proposed amendments to several pieces of legislation that affect the planning process in Ontario via Bill 108, the *More Homes, More Choice Act*. Bill 108 received Royal Assent and came into law on June 6th, 2019. The analysis below focuses on the key amendments to the *Planning Act, Development Charges Act* and *Heritage Act* which are of significance to Haldimand County. They include:

Planning Act

- Amendments to the *Planning Act (*and *Local Planning Appeals Tribunal Act)* that will broaden the Local Planning Appeal Tribunal's (LPAT) powers and restore many of the Ontario Municipal Board-era rules for appeals and hearings. In particular:
    1. **Grounds for appeal:** Bill 108 proposes to repeal the requirement that appeals be exclusively on the basis that approval of the instrument is inconsistent with the Provincial Policy Statement, fails to conform or conflicts with a provincial plan or fails to conform with an Official Plan. Appellants can still raise these grounds of appeal (and provide supporting reasons), but would no longer be limited to just those grounds.

2. **No two-step appeal process:** Bill 108 proposes to return to a single hearing where the LPAT would have the power to make a final determination approving, refusing to approve or modifying all or part of the instrument under appeal. Bill 108 also proposes to amend restrictions in the current *LPAT Act* on parties' ability to introduce evidence and examine or cross-examine witnesses at hearings. The Tribunal will, however, have the authority to limit evidence at a hearing.
3. **Restriction on third party appeals of plans of subdivision:** Only the applicant, municipality, Minister, public body or prescribed list of persons (including utilities) are proposed to have the right to appeal an approval authority's decision on a draft plan or subdivision, lapsing provision or any condition of draft plan approval.

Staff Comment: staff do not have any specific concerns with the changes to the appeal process. In simplest terms, these changes will essentially revert the appeal system back to how it was prior to 2017 – i.e. the old Ontario Municipal Board (OMB) rules. While the LPAT changes were intended to streamline, limit appeal matters and make process more simplified, in many cases the opposite has resulted. In staff's view the OMB system represented significantly less 'front end' work for staff leading up to a hearing and was a known established process. Reverting back to the old appeal process is preferred by staff.

In terms of the restriction on subdivision appeals by the general public (item 3 above), staff do not have any significant issues with this change. The subdivision approval process is a technical approval process that typically follows the analysis, public process and Council decision relating to the principle of land use - i.e. Official Plan and zoning amendment. The process to establish principle of land use remains an appealable process.

In addition to the above, in practice here at the County, the public process that leads up to a decision on a subdivision has a large amount of public input and plan proposals have typically been revised to accommodate public interest matters and neighbourhood concerns. Thus, the plans that are typically placed before Council for final consideration are fully vetted by the public and have taken into account public input where appropriate. Further, plans are only presented to Council in final form once all functionality aspects (traffic, stormwater, servicing) and policy conformity matters (density, design/layout) have been addressed – meaning: the plans have been deemed appropriate by County staff. In short, limiting 3rd party appeals on plans that are influenced by public input and have been demonstrated to be technically sound/appropriate, makes sense and ensures that staff time and significant financial resources do not get tied up in unnecessary appeals.

- An amendment to 'speed up' local planning decisions by establishing the following timelines for municipal decisions:

Instrument	Current *Planning Act* Timeframe	Bill 108 – Proposed Timeframe
Official Plan/Official Plan Amendment	210 days	120 days
Zoning By-law Amendment	150 days	90 days
Draft Plan of Subdivision	180 days	120 days

Staff Comment: As Council is aware, Planning has developed a series of service standards that have been adopted by Council for all types of applications since 2010. The changes put forward by the Province, as set out in the table above, align with the County's service standards. These standards, in particular for *standard* planning applications (the majority of applications received), are achievable as evidenced by the compliance rate reported on each year (typically around 90%). Staff do note that for complex major applications in any of the above noted categories, the Bill 108 timelines would be a challenge to achieve and additional time is typically required to complete a fulsome review, obtain additional information/clarification from applicants and bring forward

recommendations to Council. Thus, these timeframes will not be achieved in all circumstances nor all the time.

- Changes to the *Planning Act* would extend permissions for Secondary Suites, authorizing additional units in detached, semi-detached and row houses, in both the primary dwelling and ancillary buildings or structures (e.g. a coach house or granny flat). Previously, policies were required to permit a secondary unit in either the primary residence or ancillary structure.

  Staff Comment: Staff have no concerns with this proposal and are working on incorporating these permissions into the new County zoning by-law. The by-law will incorporate certain criteria that must be met to facilitate permissions for these units (e.g. 1 parking space per additional unit, maintaining zone setbacks, etc.) which will provide the necessary safeguards relative to functionality of property and limiting impact to surrounding lands.

- Section 16 (5) of the *Planning Act* is amended to restrict Inclusionary Zoning to specific high-growth areas, including Major Transit Station Areas (MTSAs) and areas where a development permit system is established (neither of which apply in the County at present). The existing legislation gave municipalities permission to introduce Inclusionary Zoning – in which a percentage of units in a development of 10 or more units must be set aside as "affordable" units, and they were free to do so in all or part of the municipality.

  Staff Comment: While the County has not to date considered use of this regulatory tool, it was available as an option should the County wish to pursue it. Given these changes, the tool will no longer be available to the County unless it first implements a development permit system (DPS). Establishing a DPS would require extensive study, cost and resources to be assigned and thus makes it far more challenging for the County to pursue or consider moving forward with Inclusionary Zoning.

- Municipalities would also be required to implement Community Planning Permit Systems (CPPS) in specific areas (Section 70.2.2), including provincially significant employment zones. Planning approval timelines would then be reduced to 45 days and appeals associated with implementing planning documents removed.

  Staff Comment: The County does have a provincially significant employment zone within the Lake Erie Industrial Park as examined in the first part of this report and identified in the new Growth Plan. This means that the County would be required to implement a CPPS for that area of the County. The details on this obligation are not yet know in terms of when this would be required, the parameters of the permit CPPS (e.g. for specific types of developments?; sizes of developments?; etc.). A CPPS is the new *Planning Act* term for 'development permit system' (DPS) (also referred to in the section above) which is an approval system developed by a municipality that combines zoning, minor variance, site plan and site alteration into a single application approval framework. While the authorities to use the tool have been around for many years under the *Planning Act*, its use has been limited across the Province due to the complex administrative requirements associated with the program and the transfer of decision making authority from Council/Committee of Adjustment to staff (i.e. approvals are dealt with by a permit officer similar to how building permits are currently dealt with). Staff will continue to monitor this aspect of the Bill and report back to Council as more information is made available by the Province. In general, the concept of a streamlined permit process for employment uses in the significant employment zone is supported by Staff.

- Introduce a community benefits charge (CBC) to replace Section 37 ('Bonusing') of the *Act*, and to replace 'Soft Services' as matters to which a Development Charge can apply. This new CBC charge would allow municipalities to impose CBCs against land to pay for facilities, services, and matters such as libraries, parks and other soft services required to develop or re-develop the area. This

would replace the parkland dedication provisions in some cases. The Province will have the authority to exempt certain types of development from this charge. Before a municipality passes a CBC, local governments will be required to develop a strategy and identify the facilities, services, and matters that will be funded. The amount charged will be capped as a percentage of land values. At this point no details or regulations have been provided.

Staff Comment: Many key details and components related to the implementation of a CBC have not been provided by the Province. However, it appears that Bill 108 will complicate the local public administration of development charges. There is concern that these changes will have the effect of decreasing the value of the DCs municipalities receive while at the same time, increase the municipal administrative burden. The true financial impacts of this tool, and the County's ability to recover soft service costs and parkland will be unknown until the key details are released. The implications of passing legislation without fully being able to comprehend the fiscal implications to municipalities is troublesome. Staff will continue to monitor this and report back to Council once more details are available. Additional/more detailed concerns have been raised by the County's DC consultant (Watson & Associates) in a letter to the Province which is included as Attachment 1. Many of the concerns raised within the letter are similar to those of County staff as well as the majority of municipalities that have commented on the Bill.

Development Charges Act

- Amendments to the *Development Charges Act* will exempt secondary suites in prescribed classes of new residential buildings and ancillary structures.
- A new section of the *Act* will also freeze development charge rates at the point of filing an application, rather than at the issuance of the first building permit. The timing of payment will remain unchanged; and
- Amend rules for when Development Charges (DCs) are payable if the development is rental housing, institutional, industrial, commercial, and non-profit housing. Unless certain exceptions apply, the charge is payable in 6 annual installments when occupancy takes effect for all listed development types save and except non-profit housing, which is to be spread out over 20 years. Local governments may charge interest from when a building permit is issued with the interest rate determined by regulation.

  Staff Comment: While it is uncertain if these changes will contribute to the development of (rental/affordable) housing stock that is needed within the community, there will be additional administrative duties, potential collection issues and high probability there will be a loss of revenue for growth related capital needs. By effectively exempting secondary suites, the growth related costs of infrastructure needs for these developments will have to be funded from non-DC related sources resulting in a loss of development related revenues. Modifying the timing of DC payments/collection or when the amounts are determined will impact cash flow from this revenue stream and likely result in loss of growth related revenues. Allowing DC payments over a period of 6 years (20 years for non-profit housing) will substantially increase the administrative time and costs associated with collection of DCs, and will likely lead to delays/defaults in payments and additional revenue loss. Some revenue generation impacts could occur with the freezing of DCs at the point of application filing, but these would be limited to those situations where a project extends across/into an annual indexing (increase) period or when the 5 year DC Background Study & Update takes place.
- Amendments would change the Development Charge treatment of 'Soft Services' as part of the introduction of a community benefits charge (CBC). Under the new CBC, municipalities will be able to charge developers directly for community benefits such as libraries and daycare facilities. The

new CBC would also replace discounted services/soft services from the *Development Charges Act* such as libraries, parks, child-care and recreational facilities and therefore, only hard services/infrastructure costs and other prescribed eligible costs would be eligible for collection through DC's including roads, water, wastewater, stormwater, waste diversion and the protection services of policing and fire. Although no details are available, it appears that the proposed charges permitted under the CBC would be capped based on a portion of the appraised value of land.

Staff Comment: As noted above, many key details and components related to the implementation of a CBC have not been provided by the Province. The true financial impacts of this tool, and the County's ability to recover soft service costs and parkland will be unknown until the regulations are released. The implications of passing legislation without fully being able to comprehend the fiscal implications to municipalities is troublesome. Attachment 1 (Watson letter to Province) also reflects more details relative to staff concerns on these changes. Staff will continue to monitor this and report back to Council once more details are available.

In summary, Bill 108 undermines the County's ability to ensure that "growth pays for growth" through substantive amendments to the *Planning Act* and the *Development Charges Act*. Combined, these tools account for an important part of the County's financial strategy for its 10-year capital plan which supports critical infrastructure investments, including: library expansion and renovation projects; new or expanded parks and playgrounds; and a new recreation centre to support population growth. In addition, these changes will impact the ability to implement existing approved financing plans for recent major capital works (specifically arenas, libraries and emergency service facilities) where the County anticipated the ability to recover future Development Charges to fund the debt payments for these facilities. Given these concerns, staff is recommending a series of requests (comments) be provided to the Province as laid out in Recommendation 2 of this report.

Heritage Act

- Amendments to the *Ontario Heritage Act* will establish new, mandatory standards for designation by-laws and new time limits for confirming complete alteration and demolition applications, as well as designation decisions.
- Amendments will require municipalities to notify owners if their properties are on a cultural heritage value list. If owners believe their lands should not be designated as a heritage property, they can appeal to the municipality to remove their property from the list and challenge the designation further at the Local Planning Appeal Tribunal's (LPAT).
- Municipal decisions on designations and alterations will now be subject to appeals to the LPAT, whose decisions will be binding (replacing the current, non-binding decisions of the Conservation Review board).
- Timeframes for notices and decisions are also proposed, such as a requirement for municipalities to respond to an objection from an owner within 90 days.

  Staff Comment: While the proposed amendments grant authority to the LPAT, to manage and decide on heritage matters are removing some of the current Council decision-making authority in heritage matters, the changes are consistent with how other zoning and land use matters are managed.

FINANCIAL/LEGAL IMPLICATIONS:

It appears that changes proposed in Bill 108 will have the effect of decreasing the value of the Development Charges municipalities receive while at the same time, increase the municipal

administrative burden. The true financial impacts of this tool, and the County's ability to recover soft service costs and parkland will be unknown until the key details are released. Staff are of the opinion that Bill 108 will impact the County's financial strategy for its 10-year capital plan which supports critical infrastructure investments, including: library expansion and renovation projects; a new emergency service station, new or expanded parks and playgrounds; and a new recreation centre to support population growth. In addition, these changes will impact the ability to implement existing approved financing plans for recent major capital works (arenas, libraries and emergency service facilities) where the County anticipated the ability to recover future Development Charges to fund the debt payments for these facilities.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Watson & Associates Letter.

May 29, 2019

Mr. John Ballantine
Manager, Municipal Finance Policy Branch
Ministry of Municipal Affairs and Housing
13th Floor, 777 Bay Street
Toronto, Ontario
M5G 2E5

Dear Mr. Ballantine:

Re: Bill 108: Potential Changes to the Development Charges Act

On behalf of our many municipal clients, by way of this letter we are summarizing our perspectives on the changes to the *Development Charges Act* (D.C.A.) as proposed by Bill 108.

Watson & Associates Economists Ltd.

Watson & Associates Economists Ltd. is a firm of municipal economists, planners and accountants, which has been in operation since 1982. With a municipal client base of more than 250 Ontario municipalities and utility commissions, the firm is recognized as a leader in the municipal finance/local government field. The firm's Directors have participated extensively as expert witnesses on development charge (D.C.) and municipal finance matters at the Local Planning Appeal Tribunal (formerly known as the Ontario Municipal Board) for over 37 years.

Our background in D.C.s is unprecedented including:

- carrying out over one-half of the consulting work completed in Ontario in the D.C. field during the past decade; and
- providing submissions and participating in discussions with the Province when the D.C.A. was first introduced in 1989 and with each of the amendments undertaken in 1997 and 2015.

Changes to Eligible Services

The Bill proposes to remove "soft services" from the D.C.A. These services will be considered as part of a new "community benefits charge" (discussed below) imposed under the Planning Act. Eligible services that will remain under the D.C.A. include water, wastewater, stormwater, services related to a highway, policing, fire, transit and waste diversion.

As provided below (a detailed summary is provided in Appendix A), Province-wide this change would remove 20% of annual collections from the D.C.A.

Table 1 - Development Charge Collections - 2013 to 2017

Service Category	Total Collections 2013 to 2017	Annual Average Collections	Percentage of Total
Services Continued Within D.C.A.	$ 8,069,285,661	$ 1,613,857,132	80%
Services to be Moved to Community Benefits Charge	1,967,192,671	393,438,534	20%
Total	**$10,036,478,333**	**$ 2,007,295,667**	**100%**

Since it is unclear as to the potential ability to replace these revenues with the proposed community benefits charge, a number of concerns are raised:

- Many municipalities have constructed facilities for these various services, and the ability to recoup the annual debt charges is in question. This lost revenue may shift the burden directly onto existing taxpayers.
- A number of municipalities enter into agreements to have the developing landowner fund certain services (e.g. parkland development) and provide D.C. credits at the time of building permit issuance. It is unclear how a municipality is to honour these commitments given the new revenue structure.
- Many municipalities have projects for these services in progress. The lost funding may put these projects in jeopardy.
- Many municipalities have borrowed D.C. revenues from another D.C. service to fund these expenditures. Once again, it is unclear how to fund these balances.
- Municipalities have concerns with the potential of the Minister to limit the scope of eligible services for which community benefits charges could be imposed through regulation, particularly as this might relate to future funding plans based on this revenue source.

Waste Diversion

The Bill would remove the mandatory 10% deduction for this service.

This change will be helpful to municipalities in funding this service. Moreover, the ability to forecast the increase in needs over a period longer than 10 years will allow municipalities to better determine the long-term average increase in needs.

Payment in Installments Over Six Years

The Bill proposes that rental housing, non-profit housing and commercial/industrial/ institutional developments pay their development charges in six equal annual payments commencing the earlier of the date of issuance of a building permit or occupancy. If payments are not made, interest may be charged (at a prescribed rate) and may be added to the property and collected as taxes.

As the proposed changes to the D.C.A. are to facilitate the Province's affordable housing agenda, it is unclear why these installment payments are to be provided to commercial, industrial and institutional developments. Table 2 presents the number of non-residential building permits issued annually by Ontario municipalities over the period 2012 to 2017. Based on the past six years, municipalities would be managing installment collections on almost half a million building permits.

Table 2 - Non-residential Building Permits Issued - 2012 to 2017

Service	2012	2013	2014	2015	2016	2017	Total
Permits Issued	67,795	75,182	76,189	79,070	86,158	82,640	**467,034**

Source: Financial Information Returns - 2012 to 2017

Based on the above:

- Administration of this process to undertake annual collections, follow up on delayed payments, and pursue defaulting properties would increase administrative staffing needs significantly. If an ability to recover these administrative costs is not provided, then this would be a direct impact on property taxes.
- It is unclear what security requirements the municipality may impose. As the building permit is most often taken out by the builder, there is a disconnect with the potential owner of the building. We would recommend that the D.C.A. provide the ability to either receive securities or be able to register the outstanding collections on title to the property.
- The delay in receiving the D.C. revenue will impact the D.C. cashflow. As most of these "hard services" must be provided in advance of development occuring, it will require increased debt and borrowing costs. Added interest costs will place upward pressure on the D.C. quantum.

When the D.C. Amount is Determined

The Bill proposes that the D.C. amount for developments proceeding by site plan approval or requiring a zoning by-law amendment, shall be determined based on the D.C. charge in effect on the day of the application for site plan approval or zoning by-law amendment. If the development is not proceeding via these planning approvals,

then the amount is determined the earlier of the date of issuance of a building permit or occupancy.

Based on the above:

- We perceive the potential for abuse with respect to the zoning change requirement. A minor change in a zoning would activate this section of the D.C.A. and lock-in the rates. This would give rise to enhancing the land value of the property as it has potentially lower D.C. payments.
- D.C.s tend to increase in subsequent five-year reviews, because the underlying D.C.A. index does not accuratley reflect the actual costs incurred by municipalities. Locking-in the D.C. rates well in advance of the building permit issuance would produce a shortfall in D.C. revenue, as the chargeable rates will not reflect the current rate (and therefore current costs) as of the time the development proceeds to be built. If municipalities are being required to maintain these charges, then the D.C.A. should provide for adjustment to reflect changes in actual costs, allow for ease of amendment between review periods, and index charges based on actual cost experience.
- There should be a time limit established in the D.C.A. as to how long the development takes to move from site plan application, or zoning application, to the issuance of a building permit. There is no financial incentive for the development to move quickly to building permit if this is not provided. Although the D.C.A. indicates that the Minister may regulate this, if no regulation is provided then the rates would be set in perpetuity.

Second Dwelling Units in New Residential Developments or Ancillary to an Existing Dwelling Unit are to be Exempt from Paying Development Charges

We perceive that imposing an immediate exemption for a second unit in a new home will cause considerable problems for existing agreements with developers. Potential impacts could include:

- For existing agreements and in certain circumstances, the developer may not recover the full amount of the agreed-to funding.
- Alternatively, the municipality may have to recognize the potential funding loss. The municipality then must generate the funding even though these expenditures were not planned. This may cause direct impacts on debt levels, tax/use rates or delays in future funding given the added net costs to build the infrastructure.
- The potential arises for the conditions within these agreements to now be challenged in court in light of the provincial regulation changes, giving rise to considerable legal expense, delays in development (given the uncertainty of the outcome) and loss of confidence in negotiating future agreements.

- Note also that**,** with respect to allocation of capacity for water and wastewater servicing, there may be further impacts given Environmental Assessment approvals for targeted development levels.
- Increasing the number of statutory exemptions also results in a revenue loss for municipalities that have to be funded from non-D.C. funding sources, thus increasing the obligation on property taxes.

Soft Services to be Included in a New Community Benefits Charge Under the Planning Act

It is proposed that a municipality may, by by-law, impose community benefits charges against land to pay for the capital costs of facilities, services and matters required because of development or redevelopment in the area to which the by-law applies. These services may not include those authorized by the D.C.A. Various provisions are proposed as follows:

- *Before passing a community benefits charge by-law, the municipality shall prepare a community benefits charge strategy that, (a) identifies the facilities, services and matters that will be funded with community benefits charges; and (b) complies with any prescribed requirements.*
- *Land for parkland purposes will be included in this charge.*
- *The amount of a community benefits charge payable shall not exceed an amount equal to the prescribed percentage of the value of the land as of the valuation date.*
- *The valuation date is the day before building permit issuance.*
- *Valuations will be based on the appraised value of land. Various requirements are set out in this regard.*
- *All money received by the municipality under a community benefits charge by-law shall be paid into a special account.*
- *In each calendar year, a municipality shall spend or allocate at least 60 per cent of the monies that are in the special account at the beginning of the year.*
- *Requirements for annual reporting shall be prescribed.*
- *Transitional provisions are set out regarding the D.C. reserve funds and D.C. credits.*

The proposed changes are limited, in that the details are left to be defined by Regulation. As such:

- More information is needed, as there are several key items to be included as part of the regulations; i.e. what items are to be included in community benefits charge strategy and what percentage of the “value of land” is to be eligible for collection.
- Depending on what is to be included in the community benefits charge strategy, this may be undertaken at a similar time as the D.C. background study. As

noted, however, it is unclear as to the prescribed items to be included along with the process required to adopt the strategy and the by-law.

- The potential for future parkland is minimized by including it as part of the charge along with all other "soft services."
- Concern is raised regarding what prescribed percentage of the land value will be allocated for the charge. If the same percentage is provided for all of Ontario, then a single family lot in Toronto valued at $2 million will yield 20 times the revenue of a $100,000 lot in eastern Ontario. Given that building costs for the same facilities may only vary by, say, 15%, the community benefits charge will yield nominal funds to pay for required services for most of Ontario. As such, if prescribed rates are imposed, these should recognize regional, in not area-municipal, distinctions in land values.
- It is unclear how the community benefits charge will be implemented in a two-tier municipal system. Given that both the upper and lower tiers will have needs, there is no guidance on how the percentage of the land value will be allocated or how the process for allocating this would occur. Obviously, land values will vary significantly in urban versus semi-urban communities (e.g. in York Region, land value in Markham is significantly higher than in Georgina), so that the upper tier needs may only take, say, 30% of the allotted value in the urban areas but 75% to 90% of the allotted semi-urban or rural values.
- Given the need for appraisals and the ability of the applicant to challenge the appraisal, a charging system based on land values will be extremely cumbersome and expensive. It is unclear how appraisal costs are recovered and the appraisals may become significant costs on each individual property.

By-laws That Expire After May 2, 2019

The Bill provides in subsection 9.1 (1) that a development charge by-law expiring on or after May 2, 2019 and before the prescribed date shall remain in force as it relates to the soft services being moved to community benefits charges.

Confusion is produced by this section of the Bill. There are many municipal D.C. by-laws (over 70) currently set to expire between May and August of this year. Until the Bill is passed into law, these D.C. by-laws will need to be replaced by new ones. This section of the Bill should be amended to reflect that the new D.C. rates in effect at the time of the new legislation coming into force will continue so as to not present confusion over rates as of May 2, 2019 versus rates passed under these new D.C. by-laws.

Conclusions/Observations

In late 2018/early 2019, the Province invited many sectors to participate in the Province's Housing Supply Action Plan. This process included specialized Development Charges and Housing Affordability Technical Consultations undertaken to provide input to this Action Plan. From those discussion sessions undertaken with members of the development/building community, it was acknowledged that there are

challenges for the development/building community to address the housing needs for certain sectors of the housing market. Rental housing is one example of an area where the low profit margins and high risks may limit participation by developer/builders; however, there clearly does not appear to be a Province-wide concern with D.C. rates that would warrant a wholesale reduction/elimination of D.C.s for any particular service. Arising from those discussions it was expected that these matters would be the focus of the legislated changes; however, Bill 108 has varied significantly from that target:

- The Bill makes wholesale changes to the D.C.A. which will restrict revenues collected from all forms (and all prices) of housing. Hence, the target is no longer rental or affordable housing focused. Where municipalities have been developing D.C. policies and programs to address affordable housing needs directly, the loss of D.C. funding will make these programs unaffordable due to the overall revenue lost.
- The Bill has introduced changes to collections and locking in rates, which directly benefit commercial, industrial and institutional developments, that were not part of the Province's Housing Supply Action Plan. It is unclear why this has been introduced. The six-payment plan for this sector is expected to be expensive and cumbersome to administrate.
- Many transitional items have not been addressed and it is unclear whether the developing land owner is responsible for potential revenue losses or whether that will be the responsibility of the municipality. These matters need to be addressed, otherwise time and money will be spent clarifying these matters in the courts.
- The Regulations to define the new community benefits charges have not been circulated with the Bill; hence, the magnitude of the impact cannot be calculated. It is anticipated, however, that a significant amount of revenue will be lost along with additional lands for park purposes. This either places a direct burden onto taxpayers or will reduce service levels significantly for the future.

Yours very truly,

WATSON & ASSOCIATES ECONOMISTS LTD.

Gary D. Scandlan, B.A., PLE
Director

Andrew Grunda, MBA, CPA, CMA
Principal

Appendix A

Development Charge Collections 2013 to 2017

Appendix A: Development Charge Collections 2013 to 2017

Development Charge Collections - 2013 to 2017

Service	2013	2014	2015	2016	2017	Total	Average Annual
Services Continued Within D.C.A.							
Development Studies	$ 6,785,229	$ 7,539,525	$ 9,634,244	$ 9,536,538	$ 11,607,836	**$ 45,103,372**	$ 9,020,674
Fire Protection	19,100,753	23,624,512	24,765,253	27,313,942	26,978,473	**121,782,933**	24,356,587
Police Protection	16,473,155	18,511,592	20,652,998	18,378,613	20,548,089	**94,564,447**	18,912,889
Roads and Structures	459,358,776	612,034,803	690,333,195	779,050,973	719,779,061	**3,260,556,808**	652,111,362
Transit	76,809,022	132,348,600	130,908,057	132,489,696	136,970,102	**609,525,477**	121,905,095
Wastewater	226,276,592	326,853,930	366,627,394	442,003,774	377,008,100	**1,738,769,790**	347,753,958
Stormwater	35,407,598	37,192,646	36,127,040	52,679,456	53,577,620	**214,984,360**	42,996,872
Water	249,052,732	324,843,966	373,922,202	474,822,033	513,942,477	**1,936,583,410**	387,316,682
GO Transit	7,594,651	9,005,572	10,515,931	9,837,550	10,461,361	**47,415,065**	9,483,013
D.C.A. Continued Services	**$ 1,096,858,508**	**$ 1,491,955,146**	**$ 1,663,486,314**	**$ 1,946,112,574**	**$ 1,870,873,119**	**$ 8,069,285,661**	**$ 1,613,857,132**
Services to Be Included Within New Section 37 Community Benefits Charge							
Emergency Medical Services	$ 3,112,736	$ 4,765,936	$ 5,128,696	$ 4,840,840	$ 5,773,536	**$ 23,621,744**	$ 4,724,349
Homes for the Aged	3,073,247	2,939,550	3,743,039	3,595,331	4,297,427	**17,648,594**	3,529,719
Daycare	2,499,810	3,301,019	3,088,376	1,760,689	2,473,840	**13,123,734**	2,624,747
Housing	17,947,287	18,658,790	19,786,738	16,116,747	21,684,247	**94,193,809**	18,838,762
Parkland Development	64,269,835	88,966,081	84,900,635	73,762,908	87,751,688	**399,651,147**	79,930,229
Library	28,579,595	33,673,639	32,963,569	33,161,869	34,690,844	**163,069,516**	32,613,903
Recreation	113,885,296	139,822,233	162,878,471	165,794,581	160,313,825	**742,694,406**	148,538,881
General Government	12,050,045	12,270,754	12,829,713	21,443,520	8,654,142	**67,248,174**	13,449,635
Parking	1,906,154	3,594,036	4,821,705	3,986,887	3,947,438	**18,256,220**	3,651,244
Animal Control	18,224	16,511	44,952	23,839	15,205	**118,731**	23,746
Municipal Cemeteries	38,942	69,614	55,007	170,736	108,145	**442,444**	88,489
Other	100,284,812	88,219,453	84,354,637	82,829,254	71,435,996	**427,124,152**	85,424,830
Services to be Moved to Community Benefits Charge	$ 347,665,983	$ 396,297,616	$ 414,595,538	$ 407,487,201	$ 401,146,333	**$ 1,967,192,671**	$ 393,438,534
Total	**$ 1,444,524,491**	**$ 1,888,252,762**	**$ 2,078,081,852**	**$ 2,353,599,776**	**$ 2,272,019,452**	**$10,036,478,333**	**$ 2,007,295,667**

Source: Financial Information Returns - 2013 to 2017

HALDIMAND COUNTY

Report CDP-04-2019 Community Partnership Program – Dunnville Waterfront Park Flag Pole and Storyboard Installation

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To approve a community request from the Dunnville Boat Club and centenarian resident George Culver to install a flag pole, storyboard and time capsule in Dunnville Waterfront Park.

RECOMMENDATIONS:

1. THAT Report CDP-04-2019 Community Partnership Program – Dunnville Waterfront Park Flag Pole and Storyboard Installation be received;
2. AND THAT the request from the Dunnville Boat Club and Dunnville resident George Culver to undertake the installation of a flag pole, storyboard and time capsule in Dunnville Waterfront Park, honouring the Dunnville Mudcats Hockey organization, be approved;
3. AND THAT capital funding to an upset amount of $3,395, representing 35% of the total anticipated budget of $9,700, with related funding from the Community Partnership Capital Reserve, be approved;
4. AND THAT project funding and approval are conditional upon compliance with Policy 2011-01 and County installation standards, permits and processes;
5. AND THAT the revised budget as outlined in CDP-04-2019 be approved;
6. AND THAT, as Haldimand County's partner on the project, the Dunnville Boat Club be authorized and responsible for the raising, lowering and replacing (to County standards) flags at the flag pole in accordance with Haldimand County's Flag Protocol Policy (2004-05) and as requested by the County in accordance with the policy;
7. AND THAT, in keeping with Haldimand County's Flag Protocol Policy (2004-05), approval be provided to allow for the Dunnville Boat Club's lowering of the flag upon the death of Mr. Culver.

Prepared by: Katrina Schmitz, Community Partnership Liaison

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

Dunnville Waterfront Park is the community's newest recreation asset, having opened in fall 2018 and including the signature Dunnville Farmers Market Building, walking paths adjacent to the Grand River and a recently-designated heritage tree. The downtown site is adjacent to the Dunnville Boat Club and Garfield Disher Park.

Haldimand County has received a request from the Dunnville Boat Club and local resident George Culver to install a 40' flag pole, storyboard and time capsule in Waterfront Park at the location of centre ice in the former Dunnville Arena (Attachment 1). The items are intended to honour the Dunnville Mudcats Hockey organization, which celebrated its 100th anniversary in 2014. The Boat Club and Mr. Culver would like the time capsule to be opened upon the 150th anniversary of the Dunnville Mudcats organization (in 2064); as well, they would like approval to lower the flag to half staff upon the passing of Mr. Culver, who recently celebrated his 102nd birthday.

The location for the flag pole, storyboard and time capsule is situated near a Park pathway and two benches (Attachment 2), making it ideal for the public's viewing and enjoyment as well as ensuring the assets do not interfere with potential future installations or the proper functioning of any events that may take place on the property. The request was reviewed through the Community Partnership Program (CPP); staff have provided direction associated with the installation and material specifications, and will work with the proponents should the request be approved by Council.

The total anticipated project budget is $9,700 and the Dunnville Boat Club and Mr. Culver are requesting a CPP grant of $3,395, representing 35% of the total budget, which is in accordance with the CPP policy of funding up to 35% of a total project cost.

BACKGROUND:

Haldimand County's Community Partnership Program (CPP) is intended to encourage and enhance strategic partnerships to the benefit of community stakeholders and the municipality, offering a simple, streamlined and customer-focused approach. The Program is intended to balance the rigor of the review process—necessary to ensure legitimate public interest issues are addressed—with flexibility and respect for the volunteer engagement of the groups.

Since 2011, more than seventy (70) CPP projects have been completed, leveraging more than $2 million in community-raised funds to construct more than $3.7 million in County enhancements.

In fall 2018 the Dunnville Boat Club, in partnership with local centenarian and passionate Mudcats supporter George Culver, approached Haldimand County with a request to honour the history of the hockey organization with the installation of a 40' flag pole, storyboard and time capsule in Dunnville Waterfront Park at what was centre ice in the old Arena. The Boat Club has long partnered with the County on the management of the Boat Club and ramp in Waterfront Park, and has a history of community engagement. The request from the group and Mr. Culver is for:

(i) Approval to undertake the project, with an estimated budget of $9,700, on Haldimand County property;
(ii) Capital funding to support the installation of the flag pole, storyboard and time capsule with related upset funding in the amount of $3,395 from the Community Partnership Capital Reserve, representing 35% of the total budget of $9,700;
(iii) The Dunnville Boat Club to have authorization and responsibility, on behalf of the County, to raise, lower and replace (to the County's standards) flags for this flag pole in accordance with the County's Flag Protocol Policy and as requested by the County; and
(iv) Approving an exception to Haldimand County's Flag Protocol Policy to allow the Dunnville Boat Club to lower the flag to half staff upon the passing of Mr. Culver. (Attachment 3)

ANALYSIS:

The Proponents:

For more than thirty years, the Dunnville Boat Club has had an ongoing operating agreement with the municipality for the management of the Boat Club and ramp in Dunnville Waterfront Park. The group has actively worked with the County to ensure affordable boat launching services for the community and maintenance of the facility.

George Culver is a lifelong resident of Dunnville who recently celebrated his 102nd birthday. An avid traveller throughout his life, Mr. Culver was also a huge supporter of his community, actively involved as a business owner (Culver Drilling Co. Ltd.) and member of organizations including the Dunnville Boat Club and Port Maitland Sailing Club. Among his greatest passions was hockey and, particularly, the Dunnville Mudcats, which presented him with a team jersey, stick and commemorative puck at his recent birthday celebrations. In order to support this proposal to recognize the Dunnville Mudcats organization, Mr. Culver has contributed $5,000 towards the project.

Project Details:

The intent of the proposal is to honour the history of Dunnville Mudcats Hockey, which celebrated its 100th anniversary in 2014. The project consists of three elements: the installation of a 40' flag pole at what was centre ice in the old Dunnville Arena; the placing of a storyboard outlining the significance of the location in the context of Dunnville Mudcat Hockey history; and, the burying of a time capsule, to be opened on the 150th anniversary (2064) of the Dunnville Mudcat Hockey organization.

The Dunnville Boat Club has indicated it will be responsible for raising and lowering of the flag as required as well as the purchase of flags—to the County's standard—for the location.

Project Review:

This project was reviewed by Haldimand County's Community Partnership Program (CPP) Staff Review Team.

Staff indicated the proposed location is suitable, given it is adjacent to an existing pathway and two benches, ensuring the public is able to enjoy the display. As well, the placement would not interfere with other potential future activities/installations within the Park nor will it impact the ability to hold event functions in the Park.

Staff identified that the flag pole would have to be engineered given its size, the open Park location (which often sees high winds) and low-lying site (in the flood plan). As well, feedback was provided related to the materials to be used for both the flag pole and time capsule (stainless steel for durability). Staff identified that, as the County's operating partner for this project, the Dunnville Boat Club should be responsible for the implementation of the County's Flag Protocol Policy, including the purchase of flags to the County's standard and the raising and lowering of the flag in accordance with the policy and at any request of Haldimand County. Lastly, staff noted the request to lower the flag to half staff to recognize the passing of Mr. Culver is outside of the County's Flag Protocol Policy, and would require Council approval.

Fund-Raising Plan:

Mr. Culver has contributed $5,000 towards the project; as well, commitments for in-kind service have been offered by various local contractors. It is anticipated that any additional fund-raising can be completed by July.

Project Management:

Staff will work with the proponents to develop the details of the flag pole installation as well as the storyboard content and production. Following completion of the project, members of the Dunnville Boat Club will responsible for the purchase of replacement flags (to the County's standard) as well as the

raising and lowering of the flag in accordance with Haldimand County's Flag Protocol Policy, including for any request received directly from the County. The only exception—which is being requested from Council at this time—is approval to lower the flag to half staff following the passing of Mr. Culver.

FINANCIAL/LEGAL IMPLICATIONS:

Policy No. 2011-01 states the Community Partnership Program (CPP) will encourage and actively support partnerships with not-for-profit community groups. Within the Community Capital Projects Grant Program, Council has the responsibility to approve community capital projects with an overall budget of greater than $10,000.

The overall proposed budget for this project is $9,700; the Dunnville Boat Club and Mr. Culver have requested 35% project funding from the Community Capital Projects Grants Program, which his in keeping with the related policy.

Based upon approved/recommended projects to date requiring funding form the Community Partnership Capital Reserve, there are sufficient funds available in the Reserve. Should this initiative be approved, there remains approximately $101,600 in the Community Partnership Capital Reserve which is unallocated.

The CPP policy (2011-01) requires all community funding for Council-approved projects be in place with the County or secured/confirmed with the applicable community group prior to the start of any construction/installation. The Dunnville Boat Club and Mr. Culver have secured significant funding towards this project and hope to begin installation in late summer 2019 and complete the project by the fall.

As a result of the proposed project, the following capital budget amendment is required:

	Current Approved Budget	**Proposed Revised Budget**
Expenditures:		
Dunnville Waterfront Park Flag Pole Installation	$0	$9,700
Total Expenditures:	**$0**	**$9,700**
Financing:		
Community Contribution (65%)	$0	$6,305
Community Partnership Capital Reserve (35%)	$0	$3,395
Total Financing:	**$0**	**$9,700**

In addition to the funding required for the requested installation, the Public Sector Accounting Board (PSAB) reporting standards require the County to record the fair market value of contributed assets. This enhancement will be amortized over the estimated life of the associated asset for accounting purposes.

Ongoing replacement of the flag, and management of the flag protocol (including raising and lowering of the flag as required) will be the responsibility of the Dunnville Boat Club, potentially with Haldimand County support through the Community Beautification Program. Future replacement of both the flag pole and storyboard would be reviewed as a community partnership initiative.

STAKEHOLDER IMPACTS:

This application was assessed by the Community Partnership Program's Staff Review Team, which is comprised of staff from all County Divisions. As well, staff from Facilities, Parks, Cemeteries & Forestry

Operations and Facilities Capital & Asset Management provided detailed feedback related to engineering and installation.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: Yes

Policy: No

ATTACHMENTS:

1. Dunnville Waterfront Park Map –Site & Proposed Project Location.
2. Photos – Proposed Location.
3. Haldimand County Flag Protocol Policy (No. 2004-05).

Location Map: Dunnville Waterfront Park

Location:

218 MAIN ST E
URBAN AREA OF DUNNVILLE, WARD 6

Legal Description:

PLAN 13558 LOTS 5 AND 9 TO 15 PT LOT 6 PT HYDRO ST AND RP 18R2350 PART 1 RP 18R7451

Property Assessment Number:

2810 024 002 20510 0000

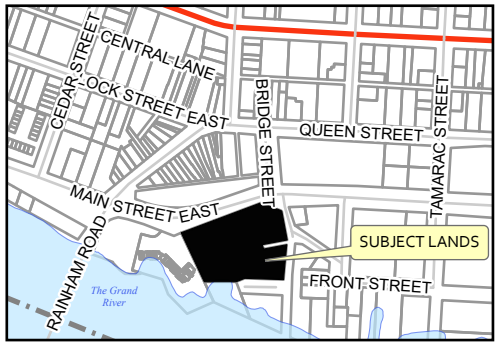
Size:

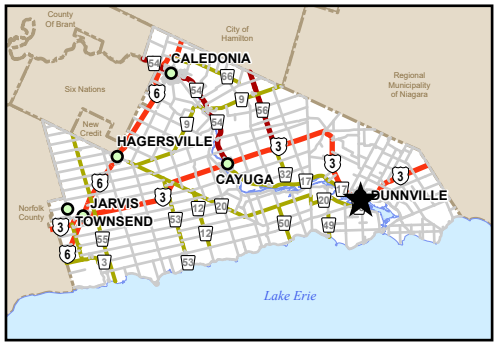
2.62 Acres

Zoning:

CS (Service Commercial)

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.





PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. Jun 2019

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Proposed Location – Waterfront Park Flag Pole, Storyboard & Time Capsule

POLICY No. 2004-05
Flag Protocol Policy

Originating Department	PS-FF-11-2004, addendum to PS-FF-09-2004		
SMT Approval:	N/A		
Council in Committee:	2004-11-22	**Recommendation #:**	19
Council Approval:	2004-11-29	**Resolution #:**	365-04
Revision History:	Click here for revision history		

1. PURPOSE

To establish a protocol for the flying and displaying of the Canadian flag and other flags on County lands and buildings.

2. POLICY

Flag Etiquette

Haldimand County will display Canadian, Provincial and Haldimand County flags in a dignified and respectful manner. When a flag becomes worn, noticeably faded or otherwise unfit for service, it will be disposed of privately by burning.

The County Flag should not be used as a table/seat cover, as a masking for boxes or as a barrier on a dais or platform.

It is not common practice to use the County Flag to cover a statue, monument or plaque for an unveiling ceremony and such use should be discouraged.

Nothing should be pinned or sewn on the County Flag.

The County Flag should not be signed or marked in any way.

Flags at Half-Mast

Haldimand County will fly flags at half-mast upon the death of the following or day of significance:

1. The Sovereign or a member of the Royal Family related in the first degree to the Sovereign (spouse, son or daughter, father, mother, brother or sister);
2. The current or a former Governor General;
3. The current or a former Prime Minister;
4. The current member of the House of Commons for the local riding;
5. The Lieutenant-Governor of Ontario;
6. The Ontario Premier;
7. The current member of the Provincial Legislative Assembly for the local riding;

8. The current or former Mayor(s) of Haldimand County;
9. A current Haldimand County Council Member;
10. A current Haldimand County Employee;
11. A current Haldimand County Volunteer Firefighter;
12. A current Haldimand County Detachment OPP Officer;
13. April 28th, the Annual Day of Mourning for Persons Killed or Injured in the Workplace;
14. November 11th, Remembrance Day.

In cases which are not addressed by this policy, the CAO or designate may poll Council to determine whether flags will be lowered.

Flags will remain in the half-mast position from the day of death and up to and including the day of the funeral. For days of significance, flags will remain in the half-mast position from sunrise to sunset or from the closing of the last scheduled workday to the reopening of the office.

Flying of Other Flags

Flags flown at County facilities will be restricted to the Canadian flag, the Provincial Flag and the Haldimand County flag, or combination thereof, displayed in the order given. Flags from other organizations will not be displayed at County facilities.

Supply of Flags

Neither Federal nor Provincial flags will be supplied free of charge to employees, organizations or the public. As supply allows, Haldimand County flags will be available for the public, employees and organizations to purchase, after one flag has been made available free of cost to a recognized non-profit community organization, upon receipt of a written request which indicates how/where the flag will be used/displayed.

REVISION HISTORY					
REPORT	CIC		COUNCIL		DETAILS
PS-GM-04-2008	Click here to enter a date.	14	1-Dec-08	188/05	References to Physical Services Department renamed to Public Works Department
SMT Approval 18-May-17	Date	Rec#	Date	Res#	Minor amendments to reflect application of policy to all County facilities flying flags; refine definitions of situations when flags are lowered, and provide latitude for CAO to address situations not addressed in policy
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	

HALDIMAND COUNTY

Report CDP-09-2019 Amendment Re: Town of Haldimand By-law 769/89 Designating the Cook-Peart House

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To update the legal description for the heritage designation by-law for the Cook-Peart House located at 3555 River Road, Caledonia.

RECOMMENDATIONS:

1. THAT Report CDP-09-2019 Amendment Re: Town of Haldimand By-law 769/89 Designating the Cook-Peart House be received;
2. AND THAT an amending by-law be prepared to update the legal description in By-law 769/89, Instrument No. HC186008 being a by-law designating the Cook-Peart House under the *Ontario Heritage Act*;
3. AND THAT following enactment of the amending by-law and there being no objections filed with the Clerk, the County's Property Coordinator be directed to remove Instrument No. HC186008 from all lands other than 3355 River Road, Caledonia;
4. AND THAT the Mayor and Clerk be authorized to execute all necessary related documents to Report CDP-09-2019.

Prepared by: Anne Unyi, Supervisor, Heritage and Culture

Reviewed by: Sheila Wilson, CPRP, Manager, Community Development and Partnerships

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

Heritage Haldimand was established to advise and assist Council on all heritage designation matters relating to Parts IV and V of the *Ontario Heritage Act*. These Parts relate to the formal designation of property to identify it as having historical, architectural or contextual value under this legislation. Executors for the Estate of the Cook-Peart House (described below and as shown in Attachment 1) have requested By-law 769/89 which designates approximately 100 acres of the William Cook Tract be amended to designate a singular property location, 3355 River Road, Caledonia being the actual Cook-Peart House only.

Staff and Heritage Haldimand have reviewed the request and recommend that By-law 769/89 be amended under Section 30.1 (2) to (10) of the *Ontario Heritage Act.*

BACKGROUND:

The Cook-Peart House, located at 3355 River Road, Caledonia was designated under Part IV of the *Ontario Heritage Act* by the Town of Haldimand August 14, 1989. At that time the designation by-law referred to a geographic area that encompassed several properties, whereas the basis of the designation was for one property only to recognize its significance as one of Haldimand County's earliest residences built by settler Nicolas Cook.

ANALYSIS:

In March 2019, staff were contacted by Solicitors on behalf of the Estate of the deceased homeowner Alfred Peart of 3355 River Road, Caledonia with reference to the Town of Haldimand By-law 769/89 which is registered on the title to this property. By-Law 769/89 designates the property for historical and architectural value or interest.

In terms of Historic Value, the Cook-Peart House is an important part of Haldimand County's historical fabric, located on the south bank of the Grand River and sitting on land granted by Joseph Brant to Nicholas Cook, one of the early settlers of Haldimand County. Since its construction in the 1830s, the house has played a significant historical role in Haldimand County by reinforcing architectural trends among early settlers.

The Cook-Peart House is an early 19th century two-storey neo-classical Georgian-style farmhouse in Oneida Township. Using local materials and vernacular Georgian architecture to great effect, examples of significant features include a three-bay front with red brick exterior, laid in Flemish bond; the first floor windows are 12 over 12 lights and the floor windows are 8 over 12 lights and the main entry door with an upper glazed panel flanked by 3-paned sidelights and an elliptical multi-paned transom, topped by an elliptical course of keystones.

Upon investigation, staff determined Town of Haldimand By-law 769/89 was intended for the Cook-Peart House, a property municipally known as 3355 River Road, Caledonia. However, as the legal description contained in that by-law (registered as Instrument No. HC186008) only referred to "Part of the William Cook Tract, in the former Township of Oneida", the by-law in fact was registered against seven (7) separate properties. Attachment 3 and 4.

Given this information, it is considered necessary to correct the legal description for the by-law contained in instrument No. HC186008 to state the heritage designation affects only the lands legally described as:

PT WILLIAM COOK BLK ONEIDA PT 7 -9 18R1095 & AS IN HC107301 (SECONDLY EXCEPT MRO IN HC22640) EXCEPT PT 1, 3, 4, 4, 6 18R1095 & PT 1 18R1252 LYING S OF RIVER RD, DESCRIPTION MAY NOT BE ACCEPTABLE IN FUTURE AS IN HC107301; S/T 07188; HALDIMAND COUNTY.

Additionally, it will be necessary to remove the designating By-law 769/89 from all properties located with the William Cook Block by deleting Instrument No. 186008 from all lands, other than 3355 River Road, Caledonia (being PIN 38177-0039LT).

FINANCIAL/LEGAL IMPLICATIONS:

Designating by-laws may be amended to correct the Legal Description of a Property under Part IV, section 30.1(2) to (10) of the *Ontario Heritage Act*.

Under section 30.1 (3) If the Council of a municipality proposes to make an amendment described in subsection (2), the Council shall give the owner of the designated property written notice of the proposed amendment in accordance with subsection (4). 2005, c. 6, s. 19. In this instance, i.e. to correct

the legal description of the property, notice of the proposed amendment is sent to the Solicitor for the Estate of Alfred Peart who is given the opportunity to object. If the Solicitor, on behalf of the Estate does not object within 30 days Council may pass the amending by-law. If the Solicitor, on behalf of the Estate does object, the proposed amendment is referred to the Conservation Review Board (CRB) in a process similar to the objection process for a designation (Attachment 2). The CRB is an adjudicative tribunal that, through the mandate provided by the *Ontario Heritage Act*, considers matters such as: the proposed designation of a property as having cultural heritage value or interest; applications for the repeal of a by-law on a specific property, etc.

To date approximately $50.00 has been spent to identify the properties affected by the erroneous by-law. It is estimated that approximately $300.00 will be spent relating to the deletion of Instrument No. HC186008 from all property other than 3355 River Road, Caledonia; this expense will be funded from the Heritage Haldimand account.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Cook-Peart Designation and Record of Designation.
2. *Ontario Heritage Act*, Part IV, section 30.1 (2) to (10).
3. Location Map (3355 River Road, Caledonia).
4. Property Index Map.

THE CORPORATION OF THE TOWN OF HALDIMAND

BY-LAW # 769/89

Being a By-Law to designate the property known municipally as the Cooke - Peart House situated on Part of the William Cook Tract in the former Township of Oneida, now in the Town of Haldimand, Regional Municipality of Haldimand-Norfolk as being of historical and architectural value.

WHEREAS The Ontario Heritage Act, 1980, Chapter 337, authorizes the council of a municipality to enact by-laws to designate real property, including all buildings and structures thereon, to be of architectural or historical value or interest; and,

WHEREAS the Council of the Corporation of the Town of Haldimand has caused to be served on the owners of the land and premises known as the Cooke - Peart House situated on Part of the William Cook Tract, in the former Township of Oneida, now in the Town of Haldimand, in the Regional Municipality of Haldimand-Norfolk, and upon The Ontario Heritage Foundation, notice of intention to designate the aforesaid property and has caused such notice of intention to be published in the same newspaper having general circulation in the municipality once for three consecutive weeks; and

WHEREAS no notice of objection to the proposed designation has been served on the Clerk of the municipality;

AND WHEREAS the reasons for designation are set out in Schedule "A" hereto;

NOW THEREFORE the Council of the Corporation of the Town of Haldimand enacts as follows:

1) That the real property known as the Cooke - Peart House situated on Part of the William Cook Tract, in the former Township of Oneida, now in the Town of Haldimand, in the Regional Municipality of Haldimand-Norfolk, be designated as being of historical and architectural value or interest, more particularly described in Schedule "A" hereto.

2. That a copy of this by-law will be registered against the property described in Schedule "B" hereto, in the proper land registry office.

3. That the Clerk is hereby authorized to cause a copy of this by-law to be served on the owner of the aforesaid property and on The Ontario Heritage Foundation and to cause notice of the passing of this by-law to be published in the same newspaper having general circulation in the municipality once for each of three consecutive weeks.

READ a first and second time this 14th day of August, 1989.
READ a third time and finally passed this 14th day of August, 1989.

MAYOR

CLERK

CERTIFIED TRUE COPY
JANIS LANKESTER
CLERK
TOWN OF HALDIMAND

SCHEDULE "A"

Reasons for Designation:

Built in the early 1830's by Nicholas Cook on land granted him by Joseph Brant it is a fine example of the two-storey Georgian style popular with the early settlers in Upper Canada.

Architectural Items Designated:

The north, east and west elevations including the front door with its curved fanlight and glass side lites; window detail 12 over 12 lites on first floor and 8 over 12 on the second floor; fireplaces with pine mantels; pine stairs with black walnut handrails all cut from trees grown on the farm.

SCHEDULE "B"

All and Singular that certain parcel of land and premises situate lying and being in the Town of Haldimand, in the Regional Municipality of Haldimand-Norfolk, formerly in the geographic Township of Oneida, in the County of Haldimand, and Province of Ontario containing 100 acres more or less and being composed of part of the William Cook Tract in the said Township of Oneida more particularly described as follows:-

COMMENCING at a point in the southwest limit of the William Cook Tract where it is intersected by the dividing line between the William Cook Tract and the William Dennis Tract;

THENCE Northwesterly along the southwesterly limit of the William Cook Tract, 1315.4 feet to a point;

THENCE North 46 degrees 14 minutes East 7,000 feet more or less to the water's edge of the Grand River;

THENCE Southeasterly along the water's edge, 750 feet more or less to a point which is arrived at as follows:-

COMMENCING at a point in the southwesterly limit of the William Cook Tract where it is intersected by the dividing line between the William Cook Tract and the William Dennis Tract;

THENCE North 45 degrees 43 minutes East, 381.5 feet;

THENCE North 45 degrees 10 minutes West, 657.7 feet;

THENCE North 46 degrees 14 minutes East, 3838.4 feet to a point;

THENCE North 45 degrees 59 minutes East, 2305 feet to a point;

THENCE North 46 degrees 09 minutes East, 268 feet to a point;

THENCE North 68 degrees 32 minutes East, 360 feet more or less to the water's edge of the Grand River;

THENCE South 68 degrees 32 minutes West, 360 feet;

THENCE South 46 degrees 09 minutes West, 268 feet;

THENCE South 45 degrees 59 minutes West, 2305 feet;

THENCE South 46 degrees 14 minutes West, 3838.4 feet;

THENCE South 45 degrees 10 minutes East, 657.7 feet;

THENCE South 45 degrees 43 minutes West, 381.5 feet to the point of commencement.

TOGETHER with a small island in front of the said lands and lying in the Grand River;

SAVING AND EXCEPTING THEREOUT AND THEREFROM all that portion of the Cook's Road and all that portion of the Given Road along the Grand River included in the above described parcel, Subject to an easement No. 7188 in favour of Hydro Electric Power Commission of Ontario.

SECONDLY:- In the Town of Haldimand in the Regional Municipality of Haldimand-Norfolk, formerly in the geographic Township of Oneida, in the County of Haldimand and Province of Ontario and being composed of a southeasterly part of the William Cook Tract in the said Township containing 93 acres more or less after excepting out the area of the Given Road and Cook's Road and premising the bearing of the northwesterly limit of the said William Cook Tract to be North 45 degrees 0 minutes East and referring all bearings herein thereto, the parcel is more particularly described as follows:-

COMMENCING at a point in the line between the William Cook Tract and the William Dennis Tract, as fenced, distant North 45 degrees 43 minutes East, 381.5 feet from the most southerly angle of the William Cook Tract as found fenced;

THENCE along the line of a fence and its production, North 45 degrees 10 minutes West, 657.7 feet to a point in the centre line of Cook's Road.

THENCE North 46 degrees 14 minutes East, 3838.4 feet along the said centre line to a point;

THENCE North 45 degrees 59 minutes East, 2305.0 feet along the said centre line to a point;

THENCE North 46 degrees 09 minutes East, 268.0 feet along the said centre line to a point;

THENCE North 68 degrees 32 minutes East, 360.0 feet more or less along the said centre line and its production to a point in the southwesterly water's edge of the Grand River;

THENCE Downstream along the said Water's Edge, 470 feet more or less to a point where it is intersected by the aforesaid line between the William Cook Tract and the William Dennis Tract;

THENCE along the said line between the William Cook Tract and William Dennis Tract, South 45 degrees 43 minutes West, 128 feet more or less to a point in the southwesterly limit of a Given Road as found fenced;

THENCE continuing along the line between the William Cook Tract and the William Dennis Tract as fenced, South 45 degrees 43 minutes West 6739.2 feet to the point of commencement.

SAVING AND EXCEPTING thereout and therefrom all that portion of the Cook's Road and all that portion of the Given Road along the Grand River included in the above described parcel;

SUBJECT to an easement No. 7188 in favour of Hydro Electric Power Commission of Ontario.

Ontario Heritage Act Subsection 30.1

Amendment of designating by-law

30.1 (1) The council of a municipality may, by by-law, amend a by-law designating property made under section 29 and section 29 applies with necessary modifications to an amending by-law as though it were a by-law to designate property under that section. 2005, c. 6, s. 19.

Exception

(2) Despite subsection (1), subsections 29 (1) to (6) do not apply to an amending by-law if the purpose of the amendment is,

(a) to clarify or correct the statement explaining the property's cultural heritage value or interest or the description of the property's heritage attributes;

(b) to correct the legal description of the property; or

(c) to otherwise revise the language of the by-law to make it consistent with the requirements of this Act or the regulations. 2005, c. 6, s. 19.

Same

(3) If the council of a municipality proposes to make an amendment described in subsection (2), the council shall give the owner of the designated property written notice of the proposed amendment in accordance with subsection (4). 2005, c. 6, s. 19.

Content of notice

(4) A notice of a proposed amendment shall,

(a) contain an explanation of the purpose and effect of the proposed amendment; and

(b) inform the owner of the right to object to the proposed amendment by filing a notice of objection with the clerk of the municipality within 30 days of receiving the notice. 2005, c. 6, s. 19.

Consultation with committee

(5) The council of a municipality shall consult with its municipal heritage committee, if one has been established, before giving notice of a proposed amendment to the owner of property under subsection (3). 2005, c. 6, s. 19.

Objection

(6) The owner of a property who receives notice of a proposed amendment from a municipality under subsection (3) may, within 30 days of receiving notice of the amendment, file a notice of objection to the amendment with the clerk of the municipality setting out the reasons for the objection and all relevant facts. 2005, c. 6, s. 19.

Where no objection

(7) If no notice of objection is filed within the 30-day period under subsection (6), the council of the municipality may pass the proposed amending by-law described in subsection (2). 2005, c. 6, s. 19.

Application of s. 29

(8) If the owner of the property files a notice of objection under subsection (6) in relation to a proposed amendment described in subsection (2), subsections 29 (7) to (15.1) apply with necessary modifications to the notice of objection. 2005, c. 6, s. 19; 2009, c. 33, Sched. 11, s. 6 (6).

Notice of amendment

(9) The clerk of a municipality shall provide a copy of the by-law, as amended under this section, to the owner of the property and to the Trust and shall register the by-law against the property in the proper land registry office. 2005, c. 6, s. 19.

Requirement to update old by-laws

(10) If the council of a municipality proposes to amend a by-law designating property made under section 29 before the day the Ontario Heritage Amendment Act, 2005 received Royal Assent, the council shall include in the amendment such changes as are necessary to ensure that the by-law satisfies the requirements of section 29, as it read on the day the Ontario Heritage Amendment Act, 2005 received Royal Assent. 2005, c. 6, s. 19.

Location Map: Amend By-Law 769/89 Cook Peart House

CDP-09-2019, Attachment 3

PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT,
GIS & GRAPHICS SECTION. May 2019

Location:

3355 RIVER RD
GEOGRAPHIC TOWNSHIP OF ONEIDA
Ward 1

Legal Description:

OND BLK COOK WM PT

Property Assessment Number:

2810 153 005 02300 0000

Size:

86.26 Acres

Zoning:

A (Agricultural) & HL (Hazard Lands)

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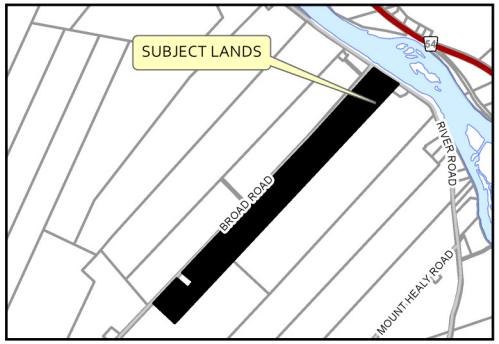

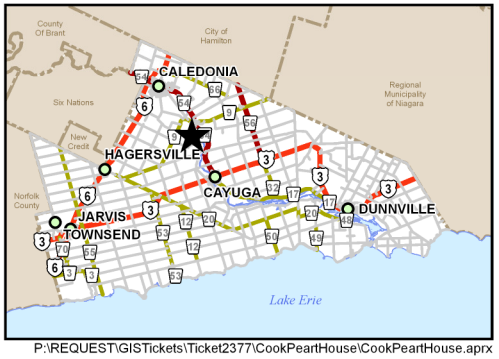

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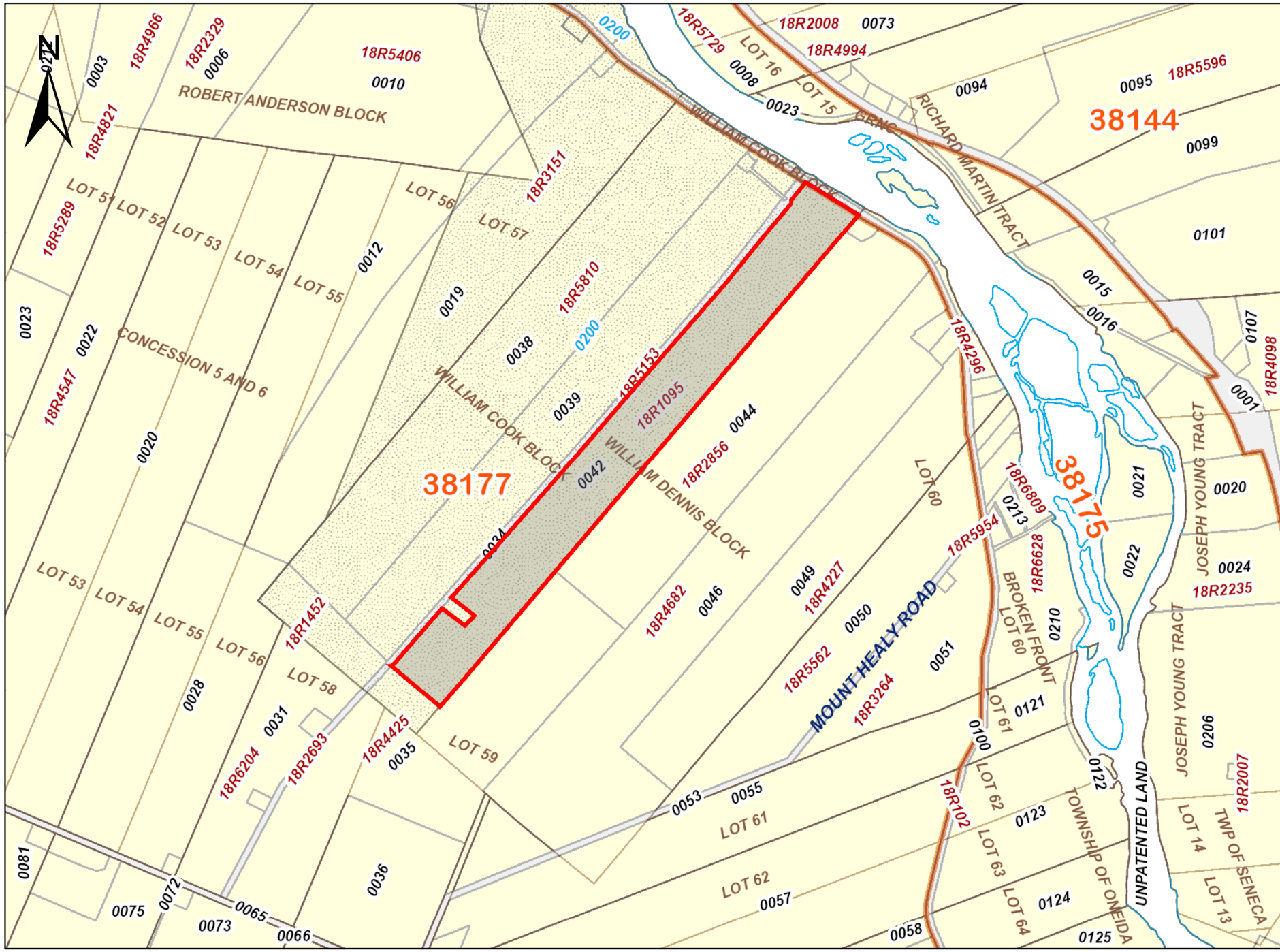

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PROPERTY INDEX MAP

HALDIMAND(No. 18)

LEGEND

FREEHOLD PROPERTY	
LEASEHOLD PROPERTY	
LIMITED INTEREST PROPERTY	
CONDOMINIUM PROPERTY	
RETIRED PIN (MAP UPDATE PENDING)	
PROPERTY NUMBER	0449
BLOCK NUMBER	08050
GEOGRAPHIC FABRIC	
EASEMENT	

THIS IS NOT A PLAN OF SURVEY

NOTES

REVIEW THE TITLE RECORDS FOR COMPLETE PROPERTY INFORMATION AS THIS MAP MAY NOT REFLECT RECENT REGISTRATIONS

THIS MAP WAS COMPILED FROM PLANS AND DOCUMENTS RECORDED IN THE LAND REGISTRATION SYSTEM AND HAS BEEN PREPARED FOR PROPERTY INDEXING PURPOSES ONLY

FOR DIMENSIONS OF PROPERTIES BOUNDARIES SEE RECORDED PLANS AND DOCUMENTS

ONLY MAJOR EASEMENTS ARE SHOWN

REFERENCE PLANS UNDERLYING MORE RECENT REFERENCE PLANS ARE NOT ILLUSTRATED

Ontario

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HALDIMAND COUNTY

Report EDT-08-2019 Rural Business and Tourism Community Improvement Plan - 4875 Rainham Road, Rainham Centre

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To seek Council approval of one (1) application for funding made under the Terms and Conditions of the Haldimand County Rural Business and Tourism Community Improvement Plan.

RECOMMENDATIONS:

1. THAT Report EDT-08-2019 Rural Business and Tourism Community Improvement Plan - 4875 Rainham Road, Rainham Centre be received;
2. AND THAT the project as outlined in Report EDT-08-2019 be approved for a grant to be funded from the Community Improvement Plan Reserve, to a maximum of $19,445;
3. AND THAT a maximum of $30,000 to be funded from the 2020 Community Improvement Plan annual allocation as a result of the approval of CIP projects identified in Reports EDT-08-2019, EDT-09-2019 and EDT-10-2019 be approved;
4. AND THAT the Mayor and Clerk execute the Rural Business and Tourism Community Improvement Plan Financial Incentive Program Agreement with the respective property owner.

Prepared by: Zach Gable, MAES, EcD, Senior Economic Development Officer

Reviewed by: Lidy Romanuk, BA, EcD, CEcD, Manager, Economic Development and Tourism

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

This proposal is to undertake various improvements to property at 4875 Rainham Road, Rainham Centre. Economic Development and Tourism staff recommend that this application be approved for funding under the Rural Business and Tourism Community Improvement Plan Financial Incentives Program, as all program eligibility requirements have been met.

BACKGROUND:

In May 2008, Haldimand County Council adopted the Haldimand County Downtown Areas Community Improvement Plan (CIP) and corresponding Downtown Community Improvement Project Areas (CIPAs). The CIP provides Council with the ability to offer financial incentives to private property owners to revitalize, redevelop, and renovate properties and buildings within the CIPAs. The CIPAs are identified as the downtown areas of the communities of Caledonia, Cayuga, Dunnville, Hagersville, Jarvis and Selkirk. In September 2013, Council approved the Rural Business and Tourism Community

Improvement Plan (RBTCIP). The RBTCIP targets key Haldimand County economic objectives by supporting hamlets, commercial roofed accommodations and value added agricultural businesses. Amendments in November 2014, added a new program to the Downtown Areas CIP to include interior renovations for places of assembly related to arts and culture, commercial roofed accommodations and restaurants, and expanded eligible costs for existing programs based on supporting the growth of the County's tourism businesses.

Economic Development and Tourism (EDT) staff continue to promote both financial incentive programs to the communities and stakeholders. EDT staff also assist proponents with their applications, in order to bring eligible projects before Council in a timely manner. Further, staff continue to work with applicants to ensure that their projects move forward to completion.

As of this report date, one hundred and twenty-nine (129) Downtown Areas CIP applications and twenty-four (24) RBTCIP applications have been approved (including Report EDT-08-2019, EDT-09-2019 and EDT-10-2019). One hundred and twenty-nine (129) of the previously approved applications have been completed and the files have been closed on three (3) applications. Downtown area grants have been approved in Caledonia, Cayuga, Dunnville, Hagersville, Jarvis and Selkirk. Grants have been approved for value added agriculture projects in the rural areas of Haldimand County; as well, projects in the hamlets of Fisherville, Port Maitland, Rainham Centre and York have been approved under the RBTCIP.

Summary of the 153 Downtown Areas CIP and RBTCIP Applications (including EDT-08-2019, EDT-09-2019 and EDT-10-2019) Considered by Council:

Financial Incentive Program *(Including EDT-08-2019, EDT-09-2019 and EDT-10-2019)*	**Downtown Areas**	**Rural Business and Tourism**
Application and Permit Fees Refund	$227,863	$21,089
Building Restoration, Renovation and Improvement	$73,527	$197,305
Downtown Housing Grant	$157,971	N/A
Heritage Improvement Grant	$20,000	$39,923
Façade Improvement Grant	$796,898	$107,359
Total value of CIP grants provided by the County**	**$1,276,259**	**$365,676**
Total construction value of CIP Projects	$10,060,894	$1,101,658
Grant values as a percentage of construction values	13%*	33%
Council approved transfers from CIP Reserve for other initiatives	$6,360	
Total funds remaining in CIP Reserve	**-$28,356*****	

* **Grant as a % of Construction** – This calculation shows the leveraging factor; basically, how much funding the County is contributing to the project compared to the total cost of the project. As it currently stands, for every dollar granted by the County, approximately $7.00 of additional private funding has been invested in the Downtown Areas of the County. The Kinsmen Park Revitalization and Dunnville Farmers Market Project are not included in the total construction values.

** Includes grant amounts related to staff approved projects under $5,000.

*** Includes contribution from the Association of Municipalities of Ontario for Main Street Revitalization Funding Program in the amount of $69,936 (Report PED-EDT-05-2018).

ANALYSIS:

The final completed application for the property known as 4875 Rainham Road, Rainham Centre was received in May of 2019. A location map has been included in this report as Attachment 1. The property previously operated as the Rainham Dairy Freeze and was recently sold. The new owners intend to re-open the business as Three Seasons Ice Cream Parlour & Family Restaurant.

Proposed Improvements

The applicant has applied for funds for a variety of improvements to the exterior and some of the interior of the property. This application is for the Façade Improvement, Signage and Landscape Improvement Grant, the Development Charge, Planning Fees and Building Permit Grant, and the Building Restoration, Renovation and Improvement Grant.

Façade Improvement, Signage, and Landscape Improvement Grant

Work under the Façade Improvement, Signage and Landscape Improvement Grant involves siding the exterior of the building with a board and batten style siding, and leaving the existing brick as is. Photos of the existing exterior can be found in Attachment 2.

Building Restoration, Renovation and Improvement Grant

Improvements under the Building Restoration, Renovation and Improvement Grant involve improvements to rehabilitate the kitchen including improvements to the exhaust system. The applicant is also proposing the creation of an outdoor eating area and improvements to the parking area. This work involves pouring of a concrete pad that is approximately 150 square metres and includes a railing system. Substantial exterior improvements such as these are eligible under the RBTCIP as they are helping to create new commercial opportunities in the County. A site plan of the current and proposed improvements are included in Attachment 3. A waiver of site plan and building permits will be required for the proposed improvements, these fees are eligible to be rebated through Development Charge, Planning Fees and building Permit Grant.

The applicant has previously installed an accessible entrance, washroom, and a small structure for ice cream sales. As the work has been completed on these items, they are not eligible for financial incentives. Previously the property was served by outdoor washrooms and was mainly a take-out style restaurant for the summer months. The intent of the property through the proposed improvements is to create a higher end dining experience that will operate for three seasons. The intent is to license the establishment for alcohol sales.

The improvements to the property at 4875 Rainham Road, Rainham Centre align with a number of tourism development initiatives including cycling tourism, and creation of a new culinary experience.

Review Panel Recommendation			**The application is complete and recommended for approval.**		
File No.	**Community**	**Address**	**Value of Project**	**Value of Grant**	**Grant as a % of Construction**
24	Rainham Centre	4875 Rainham Road	$36,495	$19,445	53%
Building Restoration, Renovation and Improvement Grant					**$13,033**
Façade, Signage & Landscape Improvement Grant					**$5,215**

Development Charge, Planning Fees and Building Permit Grant	**$1,200**
Total Grant to 4875 Rainham Road, Rainham Centre	**$19,445**
Project Description	Application of siding, creation of an outdoor eating area – 150 square meters concrete pad with railing, improvements to exhaust system and parking area.
Conditions	1. Property taxes must be in good standing and the property must be in conformity with all County/Provincial/Federal by-laws and legislation throughout the term of the program – i.e. property standards, zoning by-laws, official plan, etc. 2. Waiver of site plan, building permits required for various improvements.

FINANCIAL/LEGAL IMPLICATIONS:

The Downtown Areas Community Improvement Plan (CIP) was established in 2008, with an annual allocation of $100,000 contributed to a Community Improvement Plan Reserve to be used to fund approved grant applications under the financial incentives component of the Downtown Areas CIP. In 2013, the annual base budget contribution was increased to $150,000 to incorporate the Downtown Areas CIP and the Rural Business and Tourism Community Improvement Plan. Upon approval of this application, Council will have approved a total of $1,641,932 from this Reserve.

This application in conjunction with those associated with reports EDT-09-2019 and EDT-10-2019 were submitted and the financial information was refined over several months. As such, there was very little ability to coordinate the projects with respect to the available funding. There are currently insufficient funds within the Community Improvement Plan Reserve to approve all three applications before Council. This application requires $19,445 in funding which would leave the Community Improvement Plan at a negative balance of $28,356, if reports EDT-08-2019, EDT-09-2019 and EDT-10-2019 are approved by Council. This is a unique situation—while the reserve has been depleted in the past—it is usually close to the end of the calendar year. There are two options available for Council to consider:

Option #1

The program guidelines state the applications are received on a first come, first serve basis. If Council chooses to proceed status quo, the recommendation is to approve reports EDT-08-2019 ($19,445) and EDT-10-2019 ($10,000) in full and approve EDT-09-2019 for a partial grant amount of $21,643 with the funds that are currently remaining in the CIP Reserve.

Option #2

Approve all three projects in full. The shortfall of approximately $28,356 could be funded from the 2020 CIP annual allocation. This would leave approximately $121,644 for new projects in 2020, if Council continues to approve the base budget allocation of $150,000 during review of the 2020 Tax Supported Operating Budget.

Staff is recommending that Council proceed with Option #2 and approve all three projects in full. As a result of the three proposed CIP projects, there will be improvements to buildings within three separate communities, new business created and potentially new employment opportunities.

Moving forward, any new applicants requesting CIP funds will be advised that the program is now closed for 2019 and that new projects will not be consider by Council until early 2020. Staff will continue

to undertake the necessary due diligence work to ensure any proposals that are submitted pending future funding meet the program intent.

Legal: A grant agreement will be prepared for execution by the Mayor and Clerk should Council approve this application. This ensures all works as approved are completed within a specified timeframe. The grant agreement was reviewed by legal counsel in the spring of 2008.

STAKEHOLDER IMPACTS:

All Community Improvement projects are circulated and reviewed by a staff committee that consists of representatives from Building & Municipal Enforcement Services, Planning and Development, Community Development and Partnerships (Heritage and Culture) and Finance Divisions. Once this project has received Council approval, staff from the Building & Municipal Enforcement Services will be required to assist Economic Development and Tourism staff to ensure that all proposed works are carried out in the manner applied for, and that terms and conditions are met.

REPORT IMPACTS:

Agreement: Yes

By-law: No

Budget Amendment: No

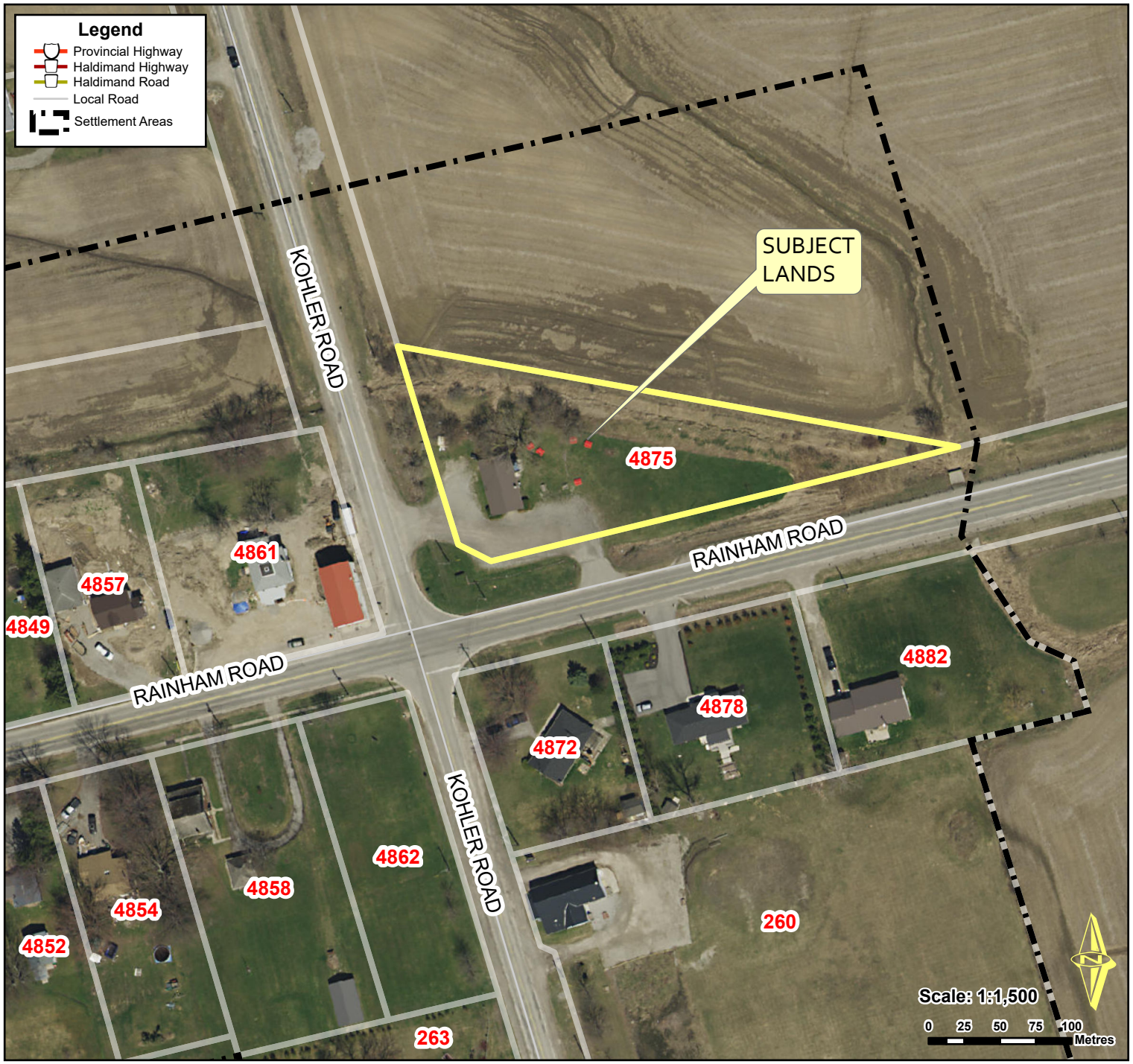
Policy: No

ATTACHMENTS:

1. Location Map of 4875 Rainham Rd, Rainham Centre.
2. Photos of the existing conditions at 4875 Rainham Rd, Rainham Centre.
3. Existing site plan 4875 Rainham Rd, Rainham Centre.

Location Map: 4875 Rainham Road

EDT-08-2019, Attachment 1



Location:

4875 RAINHAM ROAD
GEOGRAPHIC TOWNSHIP OF RAINHAM
Ward 2

Legal Description:

RNH CON 2 PT LOT 13

Property Assessment Number:

2810 158 001 80800 0000

Size:

1.02 Acres

Zoning:

RH (Hamlet Residential)

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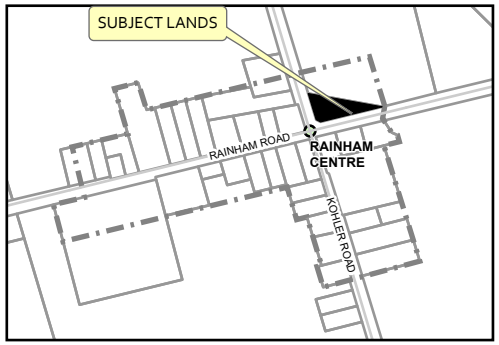

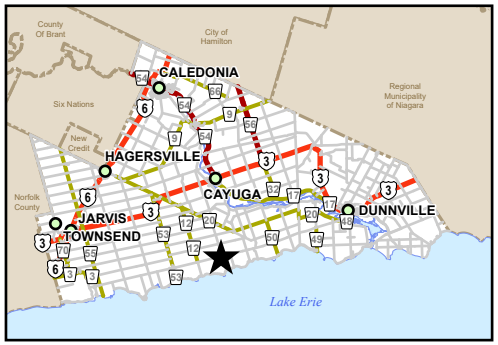

PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT,
GIS & GRAPHICS SECTION. May 2019

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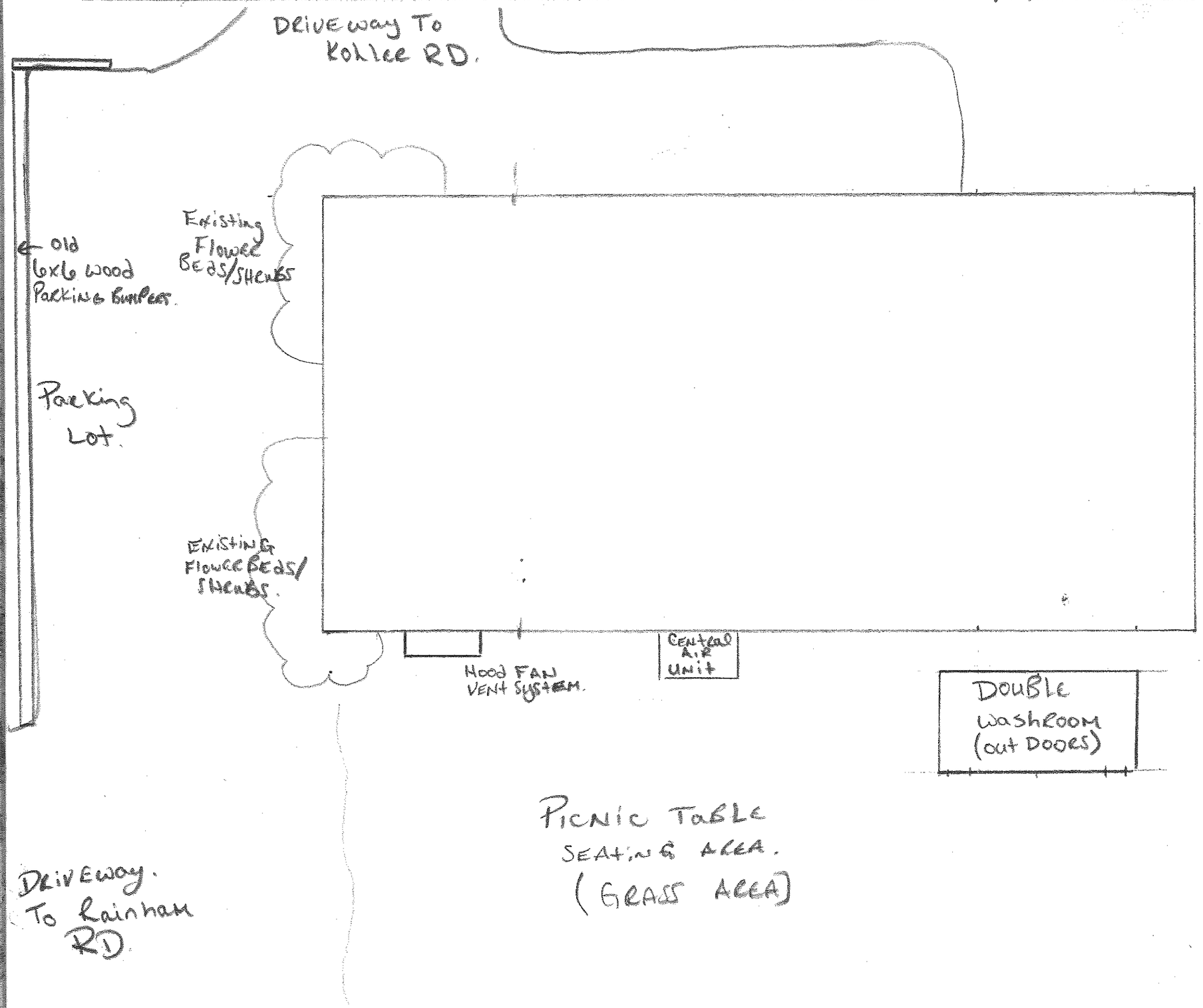
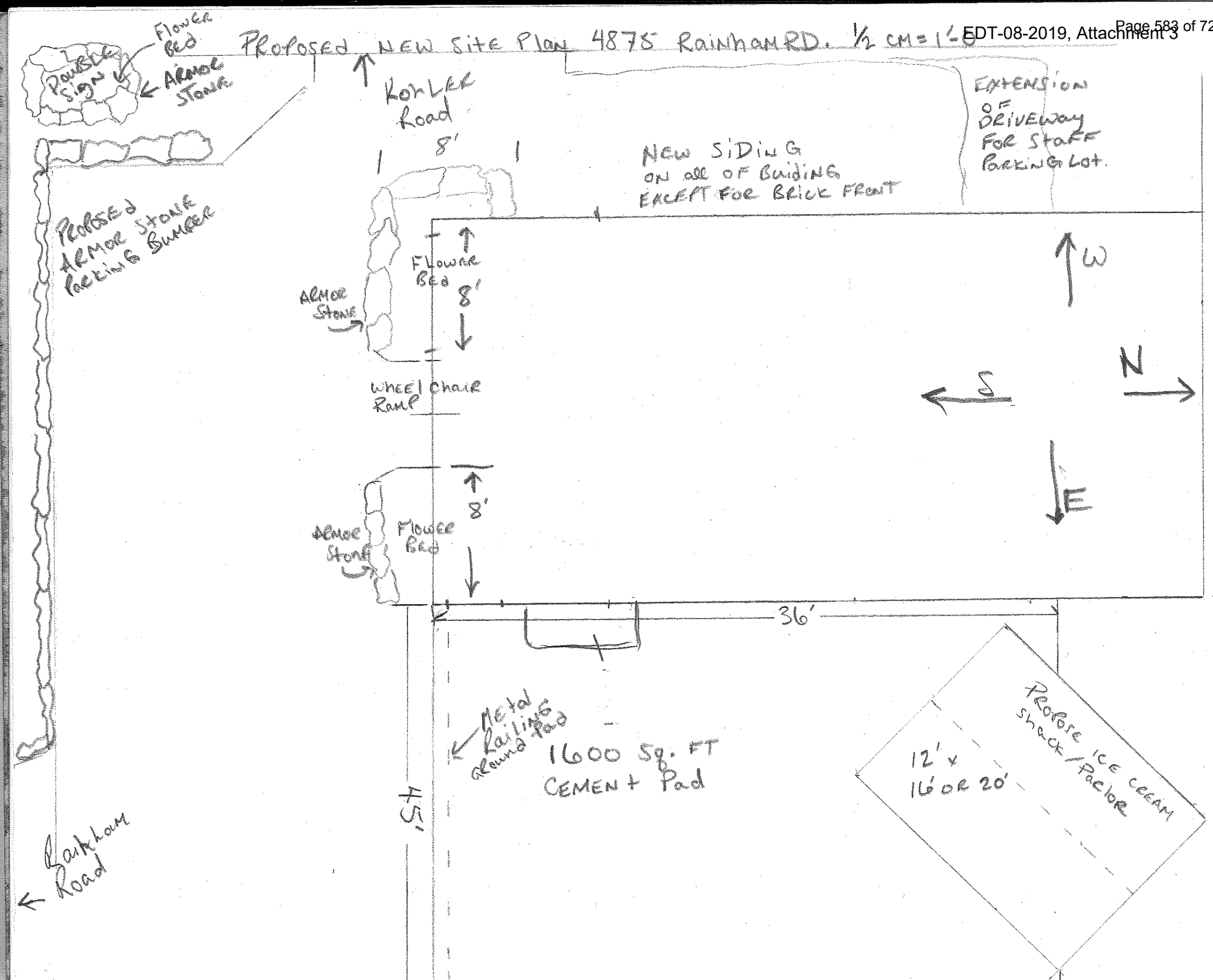
EDT-08-2019, Attachment 2

Existing Facade

EXISTING Site Plan OF 4875 Rainham R.D 1CM = 1'-0




PROPOSED NEW SITE PLAN 4875 RAINHAM RD. 1/2 CM = 1'-0
FLOWER BED
DOUBLE SIGN
ARMOR STONE
KORLER Road
8'
EXTENSION OF DRIVEWAY FOR STAFF PARKING LOT.
NEW SIDING ON all OF BUILDING EXCEPT FOR BRICK FRONT
PROPOSED ARMOR STONE PARKING BUMPER
FLOWER BED
ARMOR STONE
8'
W
N
S
E
WHEEL CHAIR RAMP
8'
ARMOR STONE
FLOWER BED
36'
METAL RAILING AROUND PAD
1600 SQ. FT CEMENT PAD
45'
12' x 16' OR 20'
PROPOSE ICE CREAM SHACK / PACKOR
RAINHAM ROAD

HALDIMAND COUNTY

Report EDT-09-2019 Downtown Areas Community Improvement Plan 2022 Main Street North, Jarvis

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To seek Council approval of one (1) application for funding made under the Terms and Conditions of the Haldimand County Downtown Areas Community Improvement Plan.

RECOMMENDATIONS:

1. THAT Report EDT-09-2019 Downtown Areas Community Improvement Plan – 2022 Main Street North, Jarvis be received;
2. AND THAT the project as outlined in Report EDT-09-2019 be approved for a grant to be funded from the Community Improvement Plan Reserve, to a maximum of $50,000;
3. AND THAT a maximum of $30,000 to be funded from the 2020 Community Improvement Plan annual allocation as a result of the approval of Community Improvement Plan projects identified in reports EDT-09-2019, EDT-08-2019 and EDT-10-2019 be approved;
4. AND THAT the Mayor and Clerk execute the Downtown Areas Community Improvement Plan Financial Incentive Program Agreement with the respective property owner.

Prepared by: Zach Gable, MAES, EcD, Senior Economic Development Officer

Reviewed by: Lidy Romanuk, BA, EcD, CEcD, Manager, Economic Development and Tourism

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

This proposal is to undertake various improvements to property at 2022 Main Street North, Jarvis. Economic Development and Tourism staff recommend that this application be approved for funding under the Downtown Areas Community Improvement Plan Financial Incentives Program, as all program eligibility requirements have been met.

BACKGROUND:

In May 2008, Haldimand County Council adopted the Haldimand County Downtown Areas Community Improvement Plan (CIP) and corresponding Downtown Community Improvement Project Areas (CIPAs). The CIP provides Council with the ability to offer financial incentives to private property owners to revitalize, redevelop, and renovate properties and buildings within the CIPAs. The CIPAs are identified as the downtown areas of the communities of Caledonia, Cayuga, Dunnville, Hagersville, Jarvis and Selkirk. In September 2013, Council approved the Rural Business and Tourism Community

Improvement Plan (RBTCIP). The RBTCIP targets key Haldimand County economic objectives by supporting hamlets, commercial roofed accommodations and value added agricultural businesses. Amendments in November 2014, added a new program to the Downtown Areas CIP to include interior renovations for places of assembly related to arts and culture, commercial roofed accommodations and restaurants, and expanded eligible costs for existing programs based on supporting the growth of the County's tourism businesses.

Economic Development and Tourism (EDT) staff continue to promote both financial incentive programs to the communities and stakeholders. EDT staff also assist proponents with their applications, in order to bring eligible projects before Council in a timely manner. Further, staff continue to work with applicants to ensure that their projects move forward to completion.

As of this report date, one hundred and twenty-nine (129) Downtown Areas CIP applications and twenty-four (24) RBTCIP applications have been approved (including reports EDT-09-2019, EDT-08-2019, and EDT-10-2019). One hundred and twenty-nine (129) of the previously approved applications have been completed and the files have been closed on three (3) applications. Downtown area grants have been approved in Caledonia, Cayuga, Dunnville, Hagersville, Jarvis and Selkirk. Grants have been approved for value added agriculture projects in the rural areas of Haldimand County; as well, projects in the hamlets of Fisherville, Port Maitland, Rainham Centre and York have been approved under the RBTCIP.

Summary of the 153 Downtown Areas CIP and RBTCIP Applications (including EDT-09-2019, EDT-08-2019 and EDT-10-2019) Considered by Council:

Financial Incentive Program *(Including EDT-09-2019, EDT-08-2019 and EDT-10-2019)*	**Downtown Areas**	**Rural Business and Tourism**
Application and Permit Fees Refund	$227,863	$21,089
Building Restoration, Renovation and Improvement	$73,527	$197,305
Downtown Housing Grant	$157,971	N/A
Heritage Improvement Grant	$20,000	$39,923
Façade Improvement Grant	$796,898	$107,359
Total value of CIP grants provided by the County**	**$1,276,259**	**$365,676**
Total construction value of CIP Projects	$10,060,894	$1,101,658
Grant values as a percentage of construction values	13%*	33%
Council approved transfers from CIP Reserve for other initiatives	$6,360	
Total funds remaining in CIP Reserve	**-$28,356*****	

* **Grant as a % of Construction** – This calculation shows the leveraging factor; basically, how much funding the County is contributing to the project compared to the total cost of the project. As it currently stands, for every dollar granted by the County, approximately $7.00 of additional private funding has been invested in the Downtown Areas of the County. The Kinsmen Park Revitalization and Dunnville Farmers Market Project are not included in the total construction values.

** Includes grant amounts related to staff approved projects under $5,000.

*** Includes contribution from the Association of Municipalities of Ontario for Main Street Revitalization Funding Program in the amount of $69,936 (Report PED-EDT-05-2018).

ANALYSIS:

The final completed application for the property known as 2022 Main Street North, Jarvis was received in May 2019. A location map has been included in this report as Attachment 1. Contact with EDT staff occurred earlier in March of 2019, and since that time, staff has worked with the applicant to finalize their plans and prepare the subject application for Council consideration. This application will utilize many of the incentives available to eligible properties under the Downtown Areas Community Improvement Plan (DACIP) including: the Façade Improvement Grant program, Downtown Housing Grant Program, and Application and Permit Fees Refund Program.

One previous DACIP application for the Façade Improvement Grant Program was approved for the previous ownership for the installation of new awnings. The property was previously known as Bronco's Tavern which has been in operation for over 40 years as a restaurant and pub. The Building has been recently purchased and the new owners have plans to undertake significant renovations. Some of the proposed changes include reconfiguring the commercial space to support a variety of new businesses including personal services, yoga/fitness studio and multi-purpose event space, paramedical services, café, a rentable commercial kitchen and creation of two (2) apartment units in the upper floor.

The following provides an overview of the improvements proposed under each section the Community Improvement Program:

Façade Improvement Grant

The existing façade is brick with awning signage. Photos of the building can be found in Attachment 2. Improvements under the Façade Improvement Grant program will include replacement of front windows, and doors and the installation of shutters. One of the new entrances will be accessible and new signage and replacement of soffit, facia and eaves are proposed. A concept for the improved façade is included in Attachment 3. The improvements have been reviewed in accordance with the County's Urban Design Guidelines and are encouraged as they maintain the heritage aspects of the building and historic downtown core.

Downtown Housing Grant

The proposed improvements include renovations to vacant space on the second floor of 2022 Main Street North, Jarvis to create two new apartment units. The work involves electrical, paint, heating, bathroom installation, kitchen, installations and flooring. This will create two (2) new two-bedroom apartments in downtown Jarvis. Floor plans of the existing commercial and residential space are included in Attachment 4. The proposed layout of the commercial and residential space can be found in Attachment 5 and concepts for the kitchens in Attachment 6.

Application and Permits

Various building and plumbing permits will be required for the planned renovations which are eligible to be refunded through the Application and Permit Fee Refund Program.

Local Economic Impacts

The proposed improvements in the application could be transformational for downtown Jarvis. The addition of apartment units will help increase the rental housing supply in Jarvis and across the County. Current vacancy rates reported by the Hamilton-Burlington Realtors Association, show residential

vacancies in the County at less than 1% which further demonstrates the need for additional housing supply.

The new commercial uses will create new employment opportunities in downtown Jarvis, but will also increase patronage to the downtown area given the types of proposed uses. The addition of a café and recreation space are particularly important to downtown revitalization projects as they help make the downtown a destination for residents and visitors.

Review Panel Recommendation			**The application is complete and recommended for approval.**		
File No.	**Community**	**Address**	**Value of Project**	**Value of Grant**	**Grant as a % of Construction ***
146	Jarvis	2022 Main street North	$439,306	$50,000	11%
Façade Improvement Grant including accessibility improvements					**15,000**
Application and Permit Fees Refund Program					**5,000**
Downtown Housing Grant Program					**30,000**
Total Grant to 2022 Main Street North					**$50,000**
Project Description	Replacement of front windows, and doors. One entrance to be accessible, new signage as well replacement of soffit, facia and eaves. Work to convert existing space into a variety of new commercial uses which include substantive plumbing, electrical and mechanical systems as well installation of a universal washroom. Creation of two new apartment units, work involves electrical, paint, heating, new bathrooms, kitchens, flooring.				
Conditions	1. Property taxes must be in good standing and the property must be in conformity with all County/Provincial/Federal by-laws and legislation throughout the term of the program – i.e. property standards, zoning by-laws, official plan, etc. 2. Building permits, plumbing permits and sign permits will be required for proposed improvements.				

FINANCIAL/LEGAL IMPLICATIONS:

The Downtown Areas Community Improvement Plan (CIP) was established in 2008, with an annual allocation of $100,000 contributed to a Community Improvement Plan Reserve to be used to fund approved grant applications under the financial incentives component of the Downtown Areas CIP. In 2013, the annual base budget contribution was increased to $150,000 to incorporate the Downtown Areas CIP and the Rural Business and Tourism Community Improvement Plan. Upon approval of this application, Council will have approved a total of $1,641,932 from this Reserve.

This application in conjunction with those associated with reports EDT-08-2019 and EDT-10-2019 were submitted and the financial information was refined over several months. As such there was very little ability to coordinate the projects with respect to the available funding. There are currently insufficient funds within the Community Improvement Plan Reserve to approve all three applications before Council. This application requires $50,000 in funding which would leave the Community Improvement Plan at a negative balance of $28,356, if reports EDT-09-2019, EDT-08-2019 and EDT-10-2019 are

approved by Council. This is a unique situation—while the reserve has been depleted in the past—it is usually close to the end of the calendar year. There are two options available for Council to consider:

Option #1

The program guidelines state the applications are received on a first come, first serve basis. If Council chooses to proceed status quo, the recommendation is to approve reports EDT-08-2019 ($19,445) and EDT-10-2019 ($10,000) in full and approve EDT-09-2019 for a partial grant amount of $21,643 with the funds that are currently remaining in the CIP Reserve.

Option #2

Approve all three projects in full. The shortfall of approximately $28,356 could be funded from the 2020 CIP annual allocation. This would leave approximately $121,644 for new projects in 2020, if Council continues to approve the base budget allocation of $150,000 during review of the 2020 Tax Supported Operating Budget.

Staff is recommending that Council proceed with Option #2 and approve all three projects in full. As a result of the three proposed CIP projects there will be improvements to buildings within three separate communities, new business created and potentially new employment opportunities.

Moving forward, any new applicants requesting CIP funds will be advised that the program is now closed for 2019 and that new projects will not be consider by Council until early 2020. Staff will continue to undertake the necessary due diligence work to ensure any proposals that are submitted pending future funding meet the program intent.

Legal: A grant agreement will be prepared for execution by the Mayor and Clerk should Council approve this application. This ensures all works as approved are completed within a specified timeframe. The grant agreement was reviewed by legal counsel in the spring of 2008.

STAKEHOLDER IMPACTS:

All Community Improvement projects are circulated and reviewed by a staff committee that consists of representatives from Building & Municipal Enforcement Services, Planning and Development, Community Development and Partnerships (Heritage and Culture) and Finance Divisions. Once this project has received Council approval, staff from the Building & Municipal Enforcement Services will be required to assist Economic Development and Tourism staff to ensure that all proposed works are carried out in the manner applied for, and that terms and conditions are met.

REPORT IMPACTS:

Agreement: Yes

By-law: No

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Location Map of 2022 Main Street North, Jarvis.
2. Photos of the existing conditions of 2022 Main Street North, Jarvis.
3. Concept for Façade Improvement.

4. Existing site plan 2022 Main Street North, Jarvis.
5. Proposed site plan 2022 Main Street North, Jarvis.
6. Concept kitchen design for apartments.

HALDIMAND COUNTY LOCATION MAP

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo,

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LEGAL DESCRIPTION FRONTAGE AND DEPTH ARE MEASURED IN FEET.

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES.
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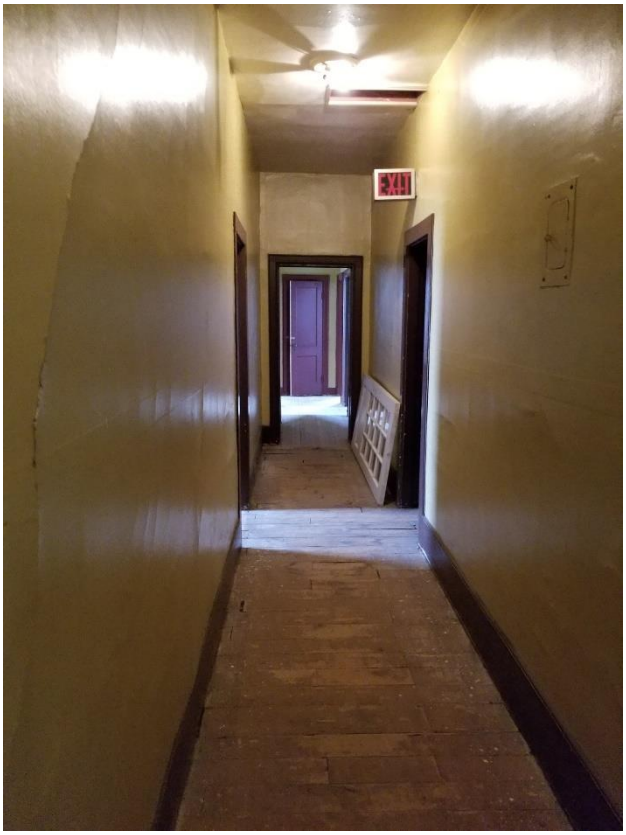
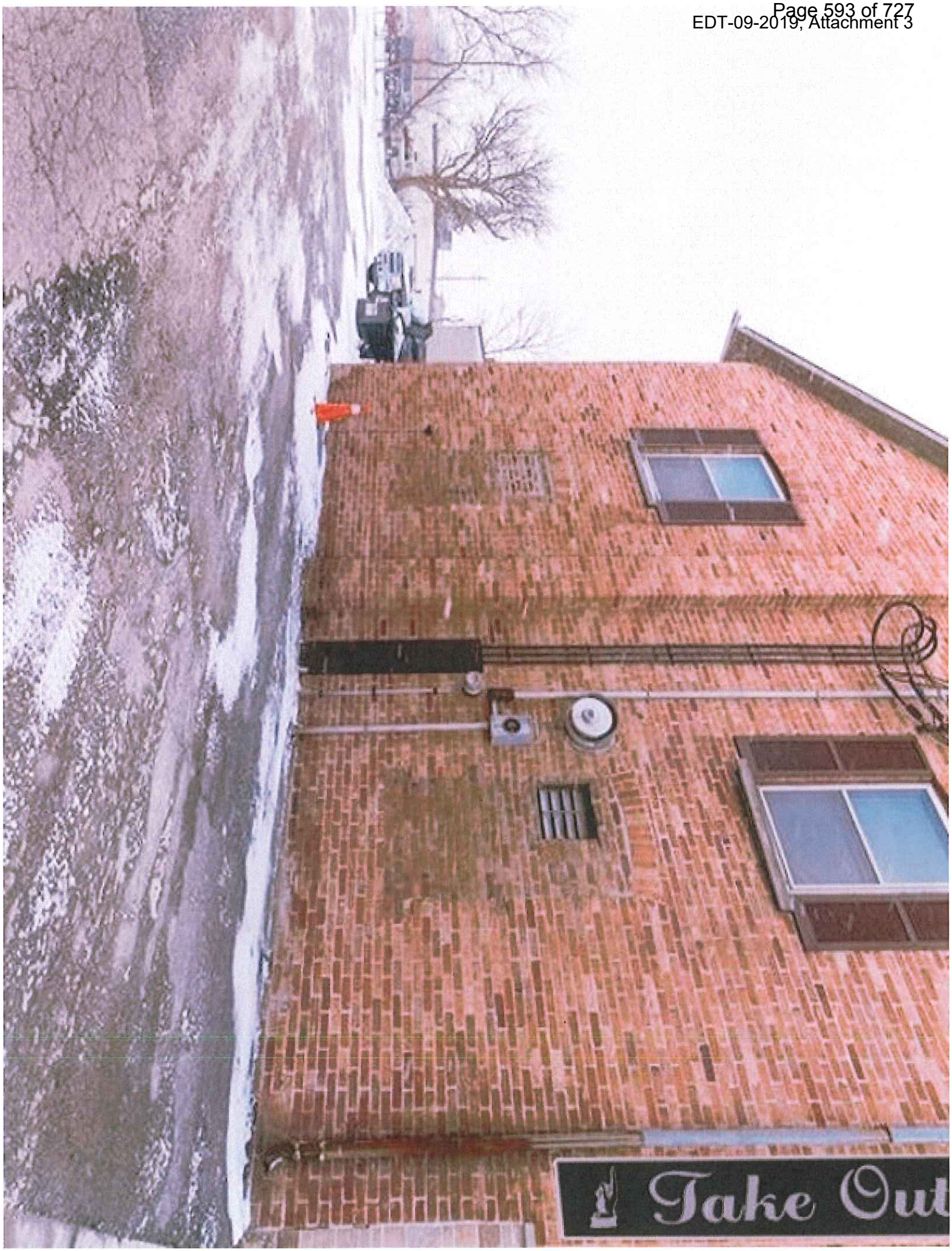
Existing Façade



Existing Upper Floor

Luxe & COMPANY
L
2022 Main Street North


Take Out

SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"

KLS ENGINEERING
1333 HIGHWAY #3
DUNNVILLE, ONTARIO
N1A 2W7
phone: (905) 774-1307
fax: (905) 774-1128

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1	ISSUED FOR REVIEW	APR 2019	LD
#	PURPOSE OF ISSUE	DATE ISSUED	BY

TRISH NOLAN

BUILDING RENOVATION

2022 MAIN ST. N
JARVIS, ON
N0A 1J0

DRAWING
EXISTING SECOND FLOOR PLAN

SCALE: AS NOTED	FILE REFERENCE: N2-19-128

DRAWING FILE NAME: TRISH - BUILDING RENOVATION - N2-19-128

DRAWN BY: MIKE DWYER	SHEET NUMBER: S-3
START DATE: APRIL 22, 2019	
SHEET: 3 OF 4	

GROUND FLOOR PLAN

KLS ENGINEERING
1333 HIGHWAY #3
DUNNVILLE, ONTARIO
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phone: (905) 774-1507
fax: (905) 774-1168

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1	ISSUED FOR REVIEW	APR. 22/19	J.D.
#	REVISION	DATE	BY

TRISH NOLAN

BUILDING RENOVATION

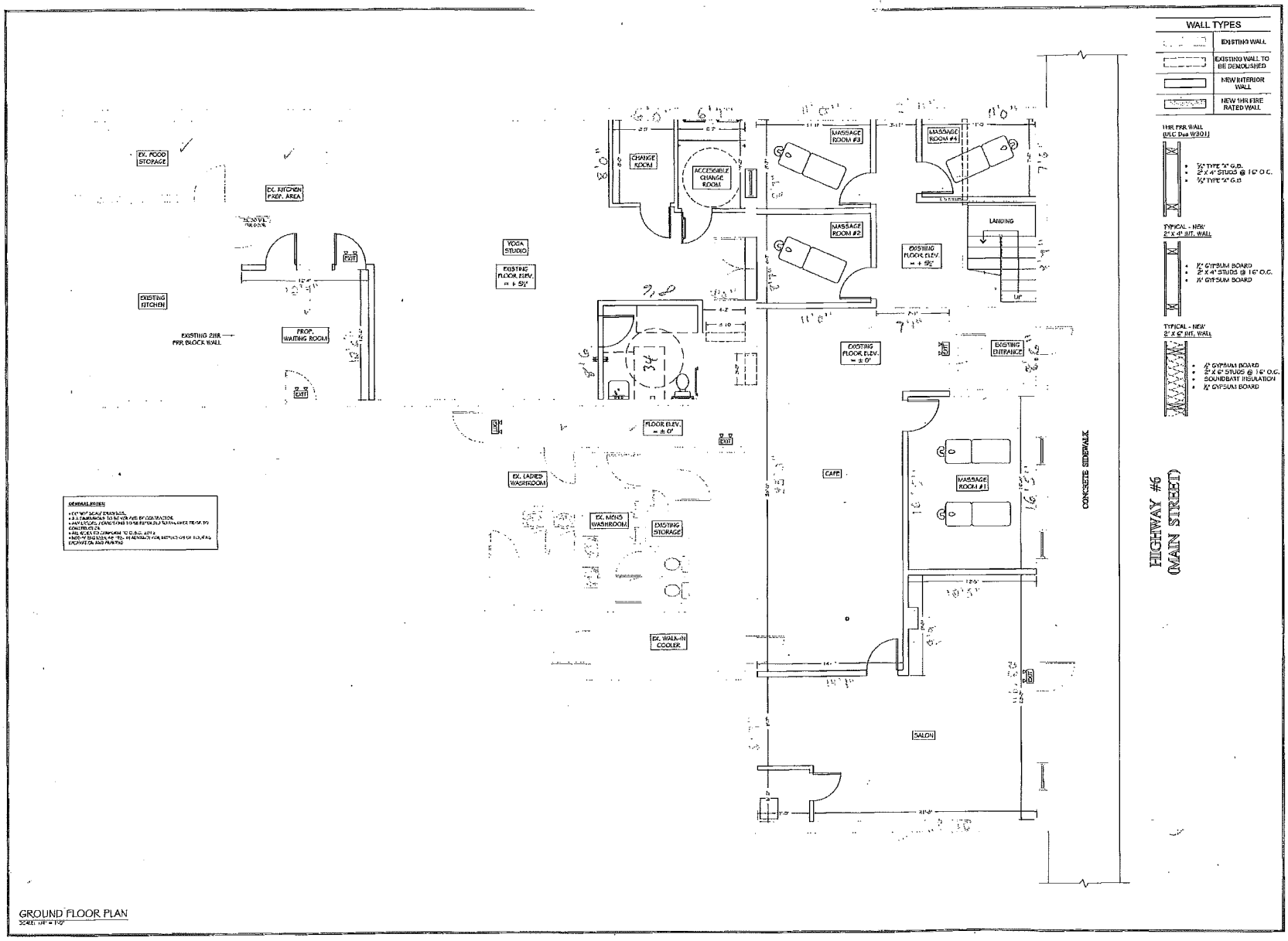
2022 MAIN ST. N
JARVIS, ON
N0A 1J0

DRAWING
EXISTING GROUND FLOOR PLAN

SCALE	KLS JOB NUMBER
AS NOTED	N2-19-128

DWG-2019\N2-19-128 TRISH - BUILDING RENOVATION - N2-19-128

DRAWN BY	SHEET NUMBER
MIKE DWYER	S-2
DRAWING DATE: APRIL 22, 2019	
SHEET: 2 OF 4	



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1	ISSUED FOR REVIEW	
#	PURPOSE OF ISSUE	

TRICIA HOLAN

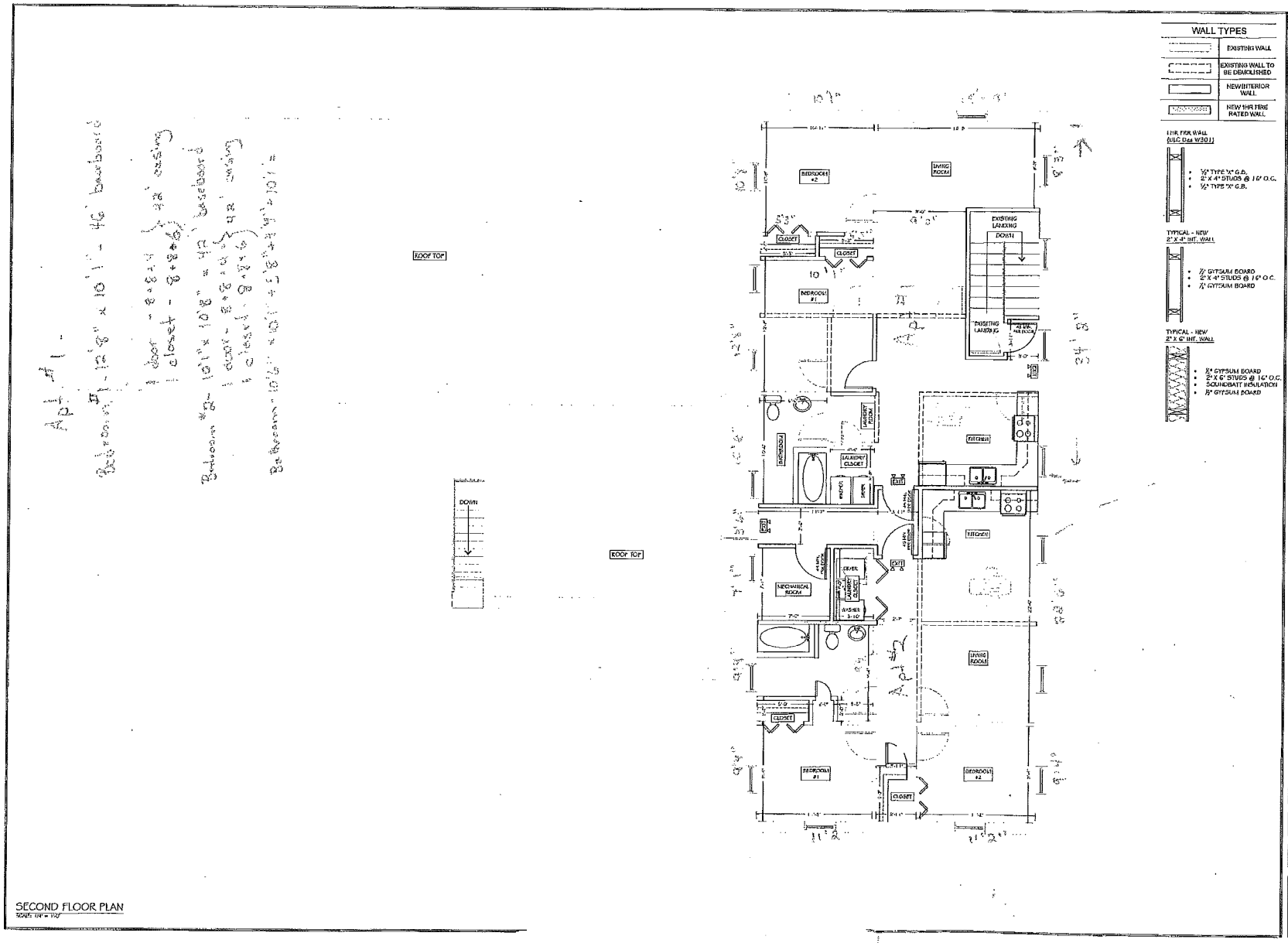
BUILDING RENOVATION

2022 MAIN ST. N
JARVIS, ON
N0A 1J0

DRAWING
EXISTING GROUND FLOOR PLAN

SCALE: AS NOTED
FILE NO./REF.: N2-19-128

DRAWN BY: MIKE DRAYER
DATE: APRIL 22, 2019
SHEET: 2 OF 4
SHEET NO.: S-2



KLS ENGINEERING

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#	REVISION	DATE

TRICIA HOLAN

BUILDING RENOVATION

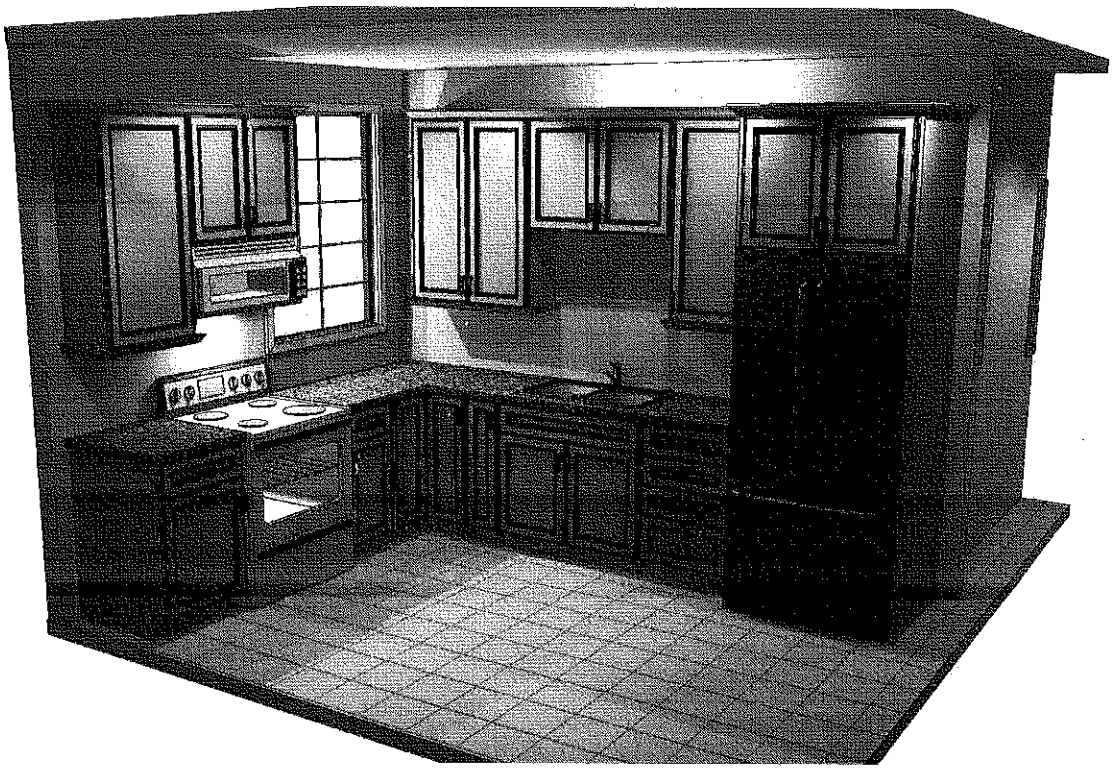
2022 MAIN ST. N
JARVIS, ON
N0A 1J0

DRAWING
EXISTING SECOND FLOOR PLAN

SCALE: AS NOTED
FILE NUMBER: N2-19-128

DRAWN BY: MIKE DWYER
START DATE: APRIL 22, 2019
SHEET: 3 OF 4

SHEET NUMBER: S-3



HALDIMAND COUNTY

Report EDT-10-2019 Downtown Areas Community Improvement Plan - 138 Queen Street, Dunnville

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To seek Council approval of one (1) application for funding made under the Terms and Conditions of the Haldimand County Downtown Areas Community Improvement Plan.

RECOMMENDATIONS:

1. THAT Report EDT-10-2019 Downtown Areas Community Improvement Plan - 138 Queen Street, Dunnville be received;
2. AND THAT the project as outlined in Report EDT-10-2019 be approved for a grant to be funded from the Community Improvement Plan Reserve, to a maximum of $10,000;
3. AND THAT a maximum of $30,000 to be funded from the 2020 CIP annual allocation as a result of the approval of CIP projects identified in Reports EDT-10-2019, EDT-08-2019 and EDT-09-2019 be approved;
4. AND THAT the Mayor and Clerk execute the Downtown Areas Community Improvement Plan Financial Incentive Program Agreement with the respective property.

Prepared by: Zach Gable, MAES, EcD, Senior Economic Development Officer

Reviewed by: Lidy Romanuk, BA, EcD, CEcD, Manager, Economic Development and Tourism

Respectfully submitted: Craig Manley, MCIP, RPP, General Manager of Community & Development Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

This proposal is to undertake façade improvements to the property at 138 Queen Street, Dunnville. Economic Development and Tourism staff recommend that this application be approved for funding under the Downtown Areas Community Improvement Plan Financial Incentives Program, as all program eligibility requirements have been met.

BACKGROUND:

In May 2008, Haldimand County Council adopted the Haldimand County Downtown Areas Community Improvement Plan (CIP) and corresponding Downtown Community Improvement Project Areas (CIPAs). The CIP provides Council with the ability to offer financial incentives to private property owners to revitalize, redevelop, and renovate properties and buildings within the CIPAs. The CIPAs are identified as the downtown areas of the communities of Caledonia, Cayuga, Dunnville, Hagersville, Jarvis and Selkirk. In September 2013, Council approved the Rural Business and Tourism Community

Improvement Plan (RBTCIP). The RBTCIP targets key Haldimand County economic objectives by supporting hamlets, commercial roofed accommodations and value added agricultural businesses. Amendments in November 2014, added a new program to the Downtown Areas CIP to include interior renovations for places of assembly related to arts and culture, commercial roofed accommodations and restaurants, and expanded eligible costs for existing programs based on supporting the growth of the County's tourism businesses.

Economic Development and Tourism (EDT) staff continue to promote both financial incentive programs to the communities and stakeholders. EDT staff also assist proponents with their applications, in order to bring eligible projects before Council in a timely manner. Further, staff continue to work with applicants to ensure that their projects move forward to completion.

As of this report date, one hundred and twenty-nine (129) Downtown Areas CIP applications and twenty-four (24) RBTCIP applications have been approved (including reports EDT-10-2019, EDT-08-2019 and EDT-09-2019). One hundred and twenty-nine (129) of the previously approved applications have been completed and the files have been closed on three (3) applications. Downtown area grants have been approved in Caledonia, Cayuga, Dunnville, Hagersville, Jarvis and Selkirk. Grants have been approved for value added agriculture projects in the rural areas of Haldimand County; as well, projects in the hamlets of Fisherville, Port Maitland, Rainham Centre and York have been approved under the RBTCIP.

Summary of the 153 Downtown Areas CIP and RBTCIP Applications (including EDT-10-2019, EDT-08-2019 and EDT-09-2019) Considered by Council:

Financial Incentive Program *(Including EDT-10-2019, EDT-08-2019 and EDT-09-2019)*	**Downtown Areas**	**Rural Business and Tourism**
Application and Permit Fees Refund	$227,863	$21,089
Building Restoration, Renovation and Improvement	$73,527	$197,305
Downtown Housing Grant	$157,971	N/A
Heritage Improvement Grant	$20,000	$39,923
Façade Improvement Grant	$796,898	$107,359
Total value of CIP grants provided by the County**	**$1,276,259**	**$365,676**
Total construction value of CIP Projects	$10,060,894	$1,101,658
Grant values as a percentage of construction values	13%*	33%
Council approved transfers from CIP Reserve for other initiatives	$6,360	
Total funds remaining in CIP Reserve	**-$28,356*****	

* **Grant as a % of Construction** – This calculation shows the leveraging factor; basically, how much funding the County is contributing to the project compared to the total cost of the project. As it currently stands, for every dollar granted by the County, approximately $7.00 of additional private funding has been invested in the Downtown Areas of the County. The Kinsmen Park Revitalization and Dunnville Farmers Market Project are not included in the total construction values.

** Includes grant amounts related to staff approved projects under $5,000.

*** Includes contribution from the Association of Municipalities of Ontario for Main Street Revitalization Funding Program in the amount of $69,936 (Report PED-EDT-05-2018).

ANALYSIS:

The final completed application for the property known as 138 Queen street, Dunnville was received in May 2019. A location map has been included in this report as Attachment 1. Contact with EDT staff occurred earlier in March of 2019, and since that time, staff has worked with the applicant to finalize their plans and prepare the subject application for Council consideration. This application is for the Façade Improvement Grant program.

No previous applications have been submitted for the property. Some elements of the existing façade are in poor repair such as the windows on the front façade of the building and the existing awning signage. Photos of the existing façade are included in Attachment 2.

Proposed improvements under the Façade Improvement Grant program include improvements to the front and rear of the building. Improvements to the front of the building involve replacement of the storefront windows and door. The windows are to be capped in black with a stone veneer added to the lower portion of the façade, a sample of the veneer can be found in Attachment 3. This has been a successful improvement by other property owners within the Dunnville CIPA.

On the rear of the building there is an existing window envelop which has been boarded up and will be replaced with a window that will also open and function as a loading door, as well replacement of another window that is partially blocked by different materials. The rear façade faces a municipal parking lot, improvements to rear façades have been previously funded by the Downtown Areas CIP. This application is supported by the County's Urban Design Guidelines to maximize visual transparency and animation from the street.

This application meets the intent of the Downtown Areas CIP and is helping to encourage retail in the downtown and aligns well with other County initiatives such as the Waterfront Park and Farmers Market Redevelopment.

Review Panel Recommendation			**The application is complete and recommended for approval.**		
File No.	**Community**	**Address**	**Value of Project**	**Value of Grant**	**Grant as a % of Construction ***
145	Dunnville	138 Queen Street	$27,441	$10,000	36%
Façade Improvement Grant					**$10,000**
Total Grant to 138 Queen Street					**$10,000**
Project Description	Installation of brick veneer, replacement of storefront windows and front entrance door. Replacement of rear door and replacement of existing rear loading doors with glass doors.				
Conditions	1. Property taxes must be in good standing and the property must be in conformity with all County/Provincial/Federal by-laws and legislation throughout the term of the program – i.e. property standards, zoning by-laws, official plan, etc.				

FINANCIAL/LEGAL IMPLICATIONS:

The Downtown Areas Community Improvement Plan (CIP) was established in 2008, with an annual allocation of $100,000 contributed to a Community Improvement Plan Reserve to be used to fund approved grant applications under the financial incentives component of the Downtown Areas CIP. In 2013, the annual base budget contribution was increased to $150,000 to incorporate the Downtown Areas CIP and the Rural Business and Tourism Community Improvement Plan. Upon approval of this application, Council will have approved a total of $1,641,932 from this Reserve.

This application in conjunction with those associated with reports EDT-08-2019 and EDT-09-2019 were submitted and the financial information was refined over several months. As such, there was very little ability to coordinate the projects with respect to the available funding. There are currently insufficient funds within the Community Improvement Plan Reserve to approve all three applications before Council. This application requires $10,000 in funding which would leave the Community Improvement Plan at a negative balance of $28,356, if reports EDT-10-2019, EDT-08-2019 and EDT-09-2019 are approved by Council. This is a unique situation—while the reserve has been depleted in the past—it is usually close to the end of the calendar year. There are two options available for Council to consider:

Option #1

The program guidelines state the applications are received on a first come, first serve basis. If Council chooses to proceed status quo, the recommendation is to approve reports EDT-08-2019 ($19,445) and EDT-10-2019 ($10,000) in full and approve EDT-09-2019 for a partial grant amount of $21,643 with the funds that are currently remaining in the CIP Reserve.

Option #2

Approve all three projects in full. The shortfall of approximately $28,356 could be funded from the 2020 CIP annual allocation. This would leave approximately $121,644 for new projects in 2020, if Council continues to approve the base budget allocation of $150,000 during review of the 2020 Tax Supported Operating Budget.

Staff is recommending that Council proceed with Option #2 and approve all three projects in full. As a result of the three proposed CIP projects there will be improvements to buildings within three separate communities, new business created and potentially new employment opportunities.

Moving forward, any new applicants requesting CIP funds will be advised that the program is now closed for 2019 and that new projects will not be consider by Council until early 2020. Staff will continue to undertake the necessary due diligence work to ensure any proposals that are submitted pending future funding meet the program intent.

Legal: A grant agreement will be prepared for execution by the Mayor and Clerk should Council approve this application. This ensures all works as approved are completed within a specified timeframe. The grant agreement was reviewed by legal counsel in the spring of 2008.

STAKEHOLDER IMPACTS:

All Community Improvement projects are circulated and reviewed by a staff committee that consists of representatives from Building & Municipal Enforcement Services, Planning and Development, Community Development and Partnerships (Heritage and Culture) and Finance Divisions. Once this project has received Council approval, staff from the Building & Municipal Enforcement Services will be required to assist Economic Development and Tourism staff to ensure that all proposed works are carried out in the manner applied for, and that terms and conditions are met.

REPORT IMPACTS:

Agreement: Yes

By-law: No

Budget Amendment: No

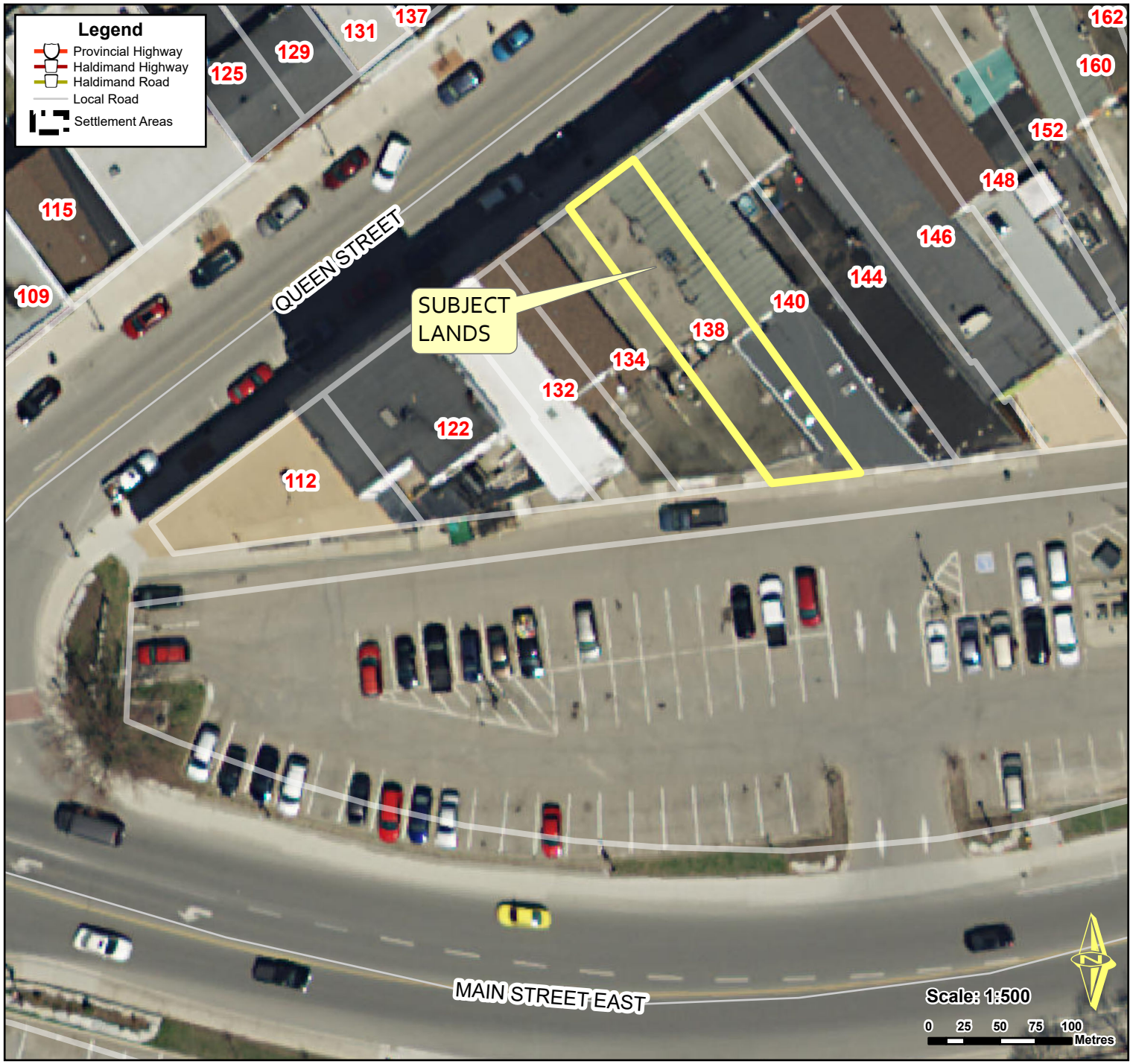
Policy: No

ATTACHMENTS:

1. Location Map of 138 Queen Street Dunnville.
2. Photos of the existing conditions of 138 Queen Street Dunnville.
3. Proposed stone veneer, Façade Improvement.

Location Map: 138 Queen Street, Dunnville

EDT-10-2019, Attachment 1



Location:

138 QUEEN STREET
URBAN AREA OF DUNNVILLE, WARD 6

Legal Description:

PLAN 69 PT LOT 2 SE QUEEN ST W PT WELLAND CANAL PLAN 3339 FIRST RANGE GRAND RIVER PT LOT 2 PLAN 13558 PT LANE AND RP 18R6749 PARTS 10 AND 11

Property Assessment Number:

2810 024 002 17100 0000

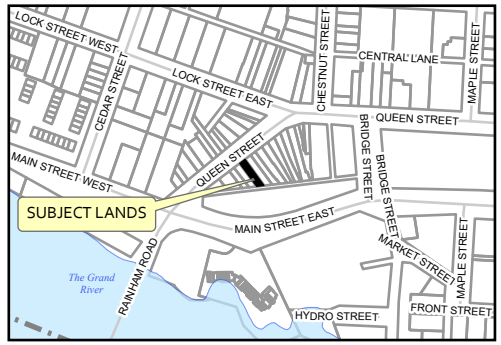
Size:

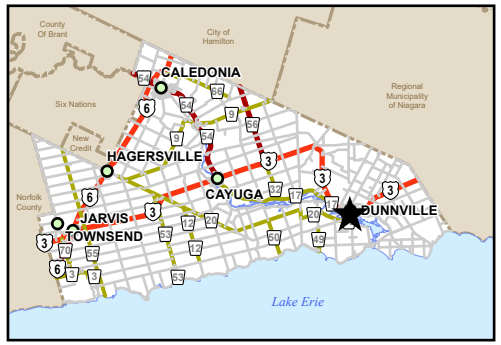
0.06 Acres

Zoning:

CG (General Commercial)

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.





PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. May 2019

P:\REQUEST\GISTickets\Ticket2433\138QueenStreet\138QueenStreet.aprx

Existing Front Façade

Existing Rear Façade

Sample stone veneer material

Example of veneer used in Downtown Dunnville

HALDIMAND COUNTY

Report ECW-13-2019 Corporate Reorganization – Engineering Services Final Organizational Structure Costing Impacts

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To obtain Council approval for the budget funding adjustments required for the Engineering Services conversion of the GIS/CAD Technologist position to an Engineering Technologist position.

RECOMMENDATIONS:

1. THAT Report ECW-13-2019 Corporate Reorganization – Engineering Services Final Organizational Structure Costing Impacts be received;
2. AND THAT the revised operating budget as outlined in Report ECW-13-2019 be included in the base budget of the 2020 Draft Tax Supported Operating Budget
3. AND THAT the capital and operating costs of the new cellphone and upgrade to a mobile workstation as outlined in Report ECW-13-2019 be authorized for the Engineering Technologist position.

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

Report CAO-03-2018 Proposed Organizational Structure provides staff the authority to proceed with the conversion of the GIS/CAD Technologist position to an Engineering Technologist position however the cost impacts of the change were not included in the report. This report outlines the estimated operating and capital cost impacts of the change.

BACKGROUND:

Report CAO-03-2018 Proposed Organizational Structure, considered in closed session, included the following clause:

(g) eliminate the GIS/CAD Technologist (Engineering) position and replace with a Drains Technologist position;

The rationale for the change is that during the planning of the corporate reorganization Engineering Services identified an opportunity to use existing staff with the required skills to provide additional field presence to more effectively manage construction projects. The original intent was to provide full-time support to the municipal drains program, however the position will now provide contract management support and field inspections to all projects hence the new title of Engineering Technologist.

ANALYSIS:

Report CAO-03-2018 Proposed Organizational Structure provides staff the authority to proceed with the conversion of the GIS/CAD Technologist position to an Engineering Technologist position however at the time the County GIS needs and best fit within the organization were still under review and the budget impacts of the position realignment were not included in the corporate reorganization report.

FINANCIAL/LEGAL IMPLICATIONS:

Report CAO-03-2018 Proposed Organizational Structure identified the total net annualized compensation costs of the reorganization based on certain assumptions for job rates, benefits coverage, etc. Subsequent to this, staff completed a comprehensive review of staff time spent on the water and wastewater systems during preparation of the 2019 Rate Supported Operating Budget. Assumptions were again reviewed for preparation of the 2019 Tax Supported Operating Budget.

The net impact of the two operating budgets was identified as $74,000 or an estimated savings of $41,000 from the original estimate of $115,000 outlined in the corporate reorganization report. The change to this position was not included in the estimate for the corporate reorganization report, nor the budget.

Given the start rate of the new position and the proposed start date in July 2019, it is anticipated that the conversion of the GIS/CAD Technologist position to an Engineering Technologist position will have a minimal cost impact of approximately $1,400 on 2019 operations. This cost will form part of the overall 2019 tax supported operating variance.

In order to fund the ongoing costs of the Engineering Technologist position, staff will include the annualized cost impacts, based on job rate, in the base budget of the Draft 2020 Tax Supported Operating Budget, resulting in a levy increase as follows:

	GIS/CAD Technologist (Grade 7)	Engineering Technologist (Estimated Grade 9 Job Rate)	2020 Tax Supported Levy Impact
Salaries	$60,720	$73,470	$12,750
Benefits	$17,280	$19,550	$2,270
Cellular Telephone Charges	$0	$360	$360
Contribution to CRR-Information Technology Reserve	$0	$50	$50
Total	**$78,000**	**$93,430**	**$15,430**

The Engineering Technologist position will have the same equipment requirements as the Municipal Technologist position and the capital and operating costs related to equipment are as follows. This will result in an amendment to the capital budget, with offsetting funding from the Capital Replacement Reserve – Information Technology:

	Current Approved Budget	Change	Proposed Revised Budget

Cell Phone	$0	$350	$350
Upgrade to Mobile Workstation	$0	$1,250	$1,250
Total Capital Expenditures	**$0**	**$1,600**	**$1,600**
CRR- Information Technology	$0	$1,600	$1,600
Total Financing	**$0**	**$1,600**	**$1,600**

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: Yes

Policy: No

ATTACHMENTS:

1. None.

HALDIMAND COUNTY

Report FCA-01-2019 Asset Management Policy

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To present to Council for their review and approval, an Asset Management Policy (AM Policy) as required by O. Reg. 588/17 Asset Management Planning for Municipal Infrastructure legislation.

RECOMMENDATIONS:

1. THAT Report FCA-01-2019 Asset Management Policy be received;
2. AND THAT the Asset Management Policy included as Attachment #1 to Report FCA-01-2019, be approved;
3. AND THAT authority be delegated to the Senior Management Team to approve any future minor or housekeeping amendments to the Asset Management Policy.

Prepared by: Cindy King, Asset Management Analyst

Reviewed by: Dave Aldred, Manager, Facilities Capital & Asset Management

Respectfully submitted: Tyson Haedrich, M. Eng., P. Eng., General Manager of Engineering & Capital Works

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

An Asset Management Policy is required to comply with O. Reg. 588/17 Asset Management Planning for Municipal Infrastructure legislation and to complete an initial step in the planning phase of an Asset Management System (AMS).

The Asset Management Policy also formalizes Haldimand County's commitment to good stewardship of its tangible infrastructure assets and affirms that asset management practices will be legislatively compliant, performed in a safe and environmentally sustainable manner and are aligned with the County's strategic mission, vision and objectives.

BACKGROUND:

The Province of Ontario has focused on improving asset management planning for municipal infrastructure since 2012. At that time, the Ministry of Infrastructure worked with municipalities and the federal government to establish a municipal infrastructure strategy.

Effective January 1st, 2018, the Province implemented O. Reg. 588/17 which was approved under the Infrastructure for Jobs and Prosperity Act, 2015. The goal of the legislation is to assist municipalities with their infrastructure planning to ensure that municipal services are sustainable, through consistent standards and the sharing of best practices and comparable data.

As part of this legislation, municipalities need to meet the following requirements by the timelines specified:

July 1, 2019	Adopt initial strategic asset management policy. Section 3 of the legislation sets out 12 matters that this policy must include and the policy must be reviewed every 5 years.
July 1, 2021	Require an adopted asset management plan for core assets (roads, bridges and culverts, water, wastewater and storm water management) that discusses current levels of service and the cost of maintaining those services. The regulation sets out both qualitative descriptions and technical metrics for each of the core assets.*
July 1, 2023	Require an adopted asset management plan for all other municipal infrastructure assets, which also discusses current levels of service and the cost of maintaining those services. The municipality is to set the technical metrics and qualitative descriptions for its other assets (e.g., culture and recreation facilities).*
July 1, 2024	Approved asset management plans shall include a discussion of proposed levels of service, the assumptions related to the proposed levels of service, what activities will be required to meet proposed levels of service and a strategy to fund the activities.

Association of Municipalities Ontario, New Municipal Asset Management Planning Regulation (January 3, 2018), *https://www.amo.on.ca/AMO-Content/Policy-Updates/2018/NewMunicipalAssetManagementPlanningRegulation*

* Municipalities, such as Haldimand County that are above 25,000 population and fall within the Greater Golden Horseshoe Growth Plan (GGHGP) area are required to identify estimated capital expenditures and significant operating costs (including energy costs) related to new construction and upgraded capacity of existing assets to meet growth demands as outlined in the GGHGP and County municipal plans.

In April 2014, in compliance with grant funding requirements, staff presented an Asset Management Plan (AMP) to Council for core infrastructure assets, including roads, bridges, culverts, water/wastewater and storm water systems through Report PW-GM-01-2014 – 2014 Asset Management Plan and provided an update in December 2014 through Report PW-GM-03-2014 – 2014 Update on the County Asset Management Plan.

In June 2018, staff presented an updated AMP to Council for non-core infrastructure assets including buildings, land improvements, machinery/equipment and fleet vehicles through Report CS-FI-12-2018 Asset Management Plan.

These plans included asset information such as inventory, valuation/replacement cost, function/performance, asset life requirements (maintenance, rehabilitation or replacement), useful life analysis, investment requirements and long term financial plans. However, due to the lack of data for asset conditions and deterioration/replacement indicators, assumptions were made using asset age and useful life estimates.

As additional information is collected for the County's infrastructure assets and as per the requirements set for the 2021, 2023 and 2024 legislative timelines, these AMP's will need to be updated. The County will also incorporate other infrastructure such as forestry related assets that weren't included in the original AMP's.

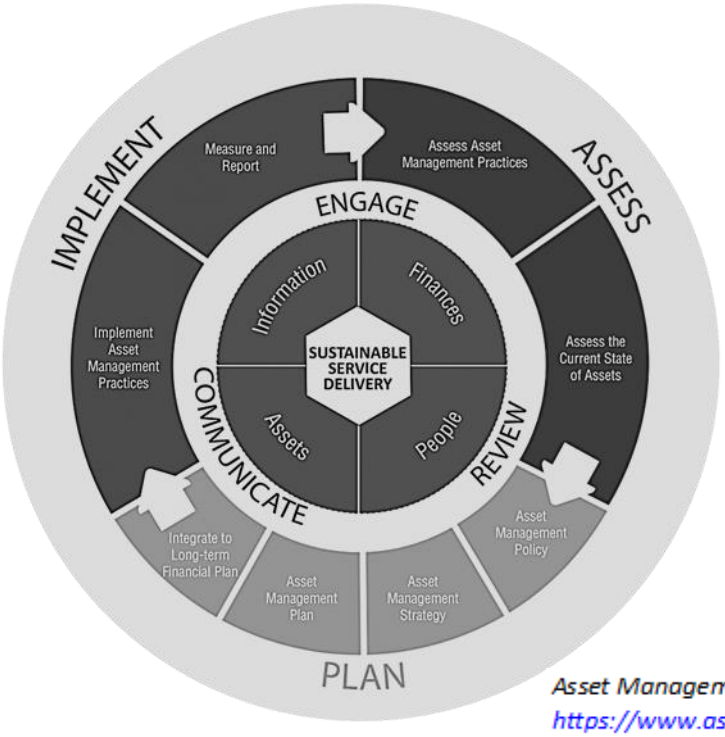
ANALYSIS:

By July 1st, 2019, the County must develop and adopt an Asset Management Policy as per the above noted legislative requirements. The purpose of an Asset Management Policy is to guide the municipality in the development of their AMS and includes such information as: principles to be followed when completing asset management activities; roles and responsibilities of Council/staff/stakeholders and alignment with the County's Strategic Plan and other County plan/strategy documents.

Good asset management involves a holistic, long-term approach where all levels of the organization are involved with infrastructure decision-making activities. Asset management is not limited to knowing what asset a municipality has and its cost. It encompasses an asset's entire lifecycle from design/planning, procurement/construction, operation/maintenance and replacement/disposal. For this reason, input from all organizational levels and stakeholders is essential to ensure that the County can make the right decisions at the right time and achieve the best value from its infrastructure assets. It is also important to note that responsible asset management involves continually reviewing and updating documents and practices to ensure that sustainable, long-range planning is realized.

In addition to the Asset Management Policy, over the next year staff will develop a Strategic Asset Management Plan (SAMP) that will detail the County's asset management objectives and outline the strategies and processes to be used for asset management activities. For example, it will specify how the County determines and applies levels of service, key performance indicators, financing strategies, resources and processes for capital projects and operation/maintenance of its infrastructure assets. This document will be required in order to complete the next AMP updates in 2021, 2023 and 2024, as identified in the timelines above.

The Asset Management Policy, the SAMP and the existing AMP's are required elements in the planning stage of an effective AMS. The diagram below shows an AMS framework. To provide Council with a better understanding of asset management, a Council Member's Toolkit supplied by the Association of Municipalities of Ontario and the Ontario Municipal Knowledge Network is available online at http://www.omkn.ca/OMKN-Docs/Asset-Management-Toolkit/OMKN-Toolkit-Questions-Municipal-Asset-Management.aspx.



Asset Management Framework - British Columbia
https://www.assetmanagementbc.ca/framework/#top

FINANCIAL/LEGAL IMPLICATIONS:

The County's Asset Management Policy and subsequently the SAMP, must align with all long-term funding plans and will form the basis for infrastructure asset capital and operating budget decisions. This integration will assist in identifying gaps between long-term costs and available funding and will outline strategies to reduce this gap.

Although financial parameters such as capitalization thresholds may be outlined through the asset management documents and processes, it is important to stress that sound asset management decisions include a variety of parameters (i.e. service levels, infrastructure condition/lifecycle, growth/demand and risk) in combination with financial ones.

In addition to legislative compliance, the Asset Management Policy and related asset management documents are also required for grant funding eligibility.

STAKEHOLDER IMPACTS:

The Asset Management Policy and the on-going development of the County's AMS is a County-wide initiative that involves and impacts all levels of the organization, public/community/commercial stakeholders, neighbouring municipalities/industry and government bodies.

By involving and seeking input from these groups, the County will be in a better position to make sound infrastructure decisions and strengthen its commitment to stakeholder accountability and transparency.

The Asset Management Policy also aligns with the County's strategic priorities of Community Vibrancy, Healthy Community and Corporate Image and Efficient Government, other County plans and strategies as outlined and legislative/association guidelines and best practices to ensure the success of its AMS.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: No

Policy: Yes

ATTACHMENTS:

1. Asset Management Policy

POLICY No. 2019-
Asset Management Policy

Originating Department	FCA-01-2019		
SMT Approval:	Select a Date		
Council in Committee:	Select a Date	**Recommendation #:**	
Council Approval:	Select a Date	**Resolution #:**	
Revision History:		Click here for revision history	

1. PURPOSE

The purpose of this policy is to provide guidance and a consistent, organization-wide framework for the development and implementation of Haldimand County's *Asset Management System (AMS)*.

This policy formalizes Haldimand County's commitment to good stewardship of *Infrastructure Assets* and emphasizes the importance of accountability and transparency to its stakeholders, through the adoption of sound *Asset Management (AM)* practices that are legislatively compliant, performed in a safe and environmentally sustainable manner and are aligned with the County's strategic mission, vision and objectives.

2. POLICY

2.1. Objectives

The objectives of this policy are to:

2.1.1. Provide guidance and a formalized commitment to good stewardship of municipal *Infrastructure Assets* and safe, sustainable and sound *AM* practices;
2.1.2. Provide a consistent framework for developing, implementing and improving an *AMS* practised by all levels of the municipality; and
2.1.3. Provide transparency and accountability and demonstrate to stakeholders, the validity of evidence-based, decision-making processes that incorporate strategic planning, budgets, *Level of Service (LOS)* and risks, while obtaining the best value from its *Infrastructure Assets*.

2.2. Legislative & Strategic Alignment:

This policy will be implemented by the County to comply with the following legislation:

- O.Reg. 588/17 Asset Management Planning for Municipal Infrastructure
- Infrastructure for Jobs and Prosperity Act, 2015

Accepted industry standards used for the implementation of this policy and the development of the County's *AMS* will include the ISO 55000/55001:2014 & ISO 55002:2018 - International Standards for Asset Management. *AM* guidelines and best practices of the following associations were also used and will continue to be referenced:

- The Institute of Asset Management (IAM)
- Asset Management Ontario (AMOntario)
- Municipal Finance Officers' Association of Ontario (MFOA)

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- Association of Municipalities Ontario (AMO)
- Federation of Canadian Municipalities (FCM)

The County will ensure that its *AMS* aligns with the Corporate Strategic Plan, is integrated into long-term financial plans and other County plans, strategies, studies and by-laws as noted in References (Section 5).

2.3. Guiding Principles:

As per legislative requirements, the County will adopt the following principles for its *AMS*:

2.3.1. *Forward-Looking:* The County will take a long-term view with respect to *AM* while considering community needs and demographic/ economic trends.

2.3.2. *Budgeting and Planning:* The County will incorporate all capital and operating budgets and financial/ fiscal plans, including those prepared for Water & Wastewater (W&WW) *Asset*s or adopted through Provincial legislation.

2.3.3. *Prioritization:* The County will clearly identify infrastructure priorities which will drive investment decisions.

2.3.4. *Consistency:* The County will ensure the continued provision of *Core Public Services*.

2.3.5. *Economic Development:* The County will promote economic competitiveness, productivity, job creation and training opportunities in support of a strong, desirable, investment-ready and innovative local economy that helps unify the community and uniquely identify Haldimand County's economic development benefits.

2.3.6. *Health and Safety:* The County will ensure that the health and safety of workers involved in the construction and maintenance of *Infrastructure Assets* is protected.

2.3.7. *Innovation:* The County will, where relevant and appropriate, create opportunities to make use of innovative technologies, services and practices, especially those developed in Ontario.

2.3.8. *Transparency:* The County will use *AM* decision-making processes that are evidence-based, transparent and based on publicly available information, subject to any applicable legislative restrictions or prohibitions. The County will also share information and implications resulting from *AM* decision-making processes with the Government and Broader Public Sector Entities as defined under the Infrastructure for Jobs and Prosperity Act, 2015.

2.3.9. *Integration:* The County will, where relevant and appropriate, be mindful and consider the principles and content of non-binding provisional or municipal plans and strategies established under an Act or otherwise, in planning and making decisions surrounding the infrastructure that supports them.

2.3.10. *Community Focused:* The County will promote community benefits (i.e. supplementary social and economic benefits) arising from an infrastructure project that is intended to improve the well-being of the affected community, through:

- Local job creation and training opportunities
- Improvement of public space within the community
- Promotion of accessibility for persons with disabilities

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- Conservation and responsible stewardship of the community's heritage, cultural and lifelong learning *Asset*s

2.3.11. *Environmentally Conscious:* The County will minimize the impact of infrastructure and *AM* decision-making processes on the environment through practices that will:

- Respect and help maintain ecological and biological diversity
- Build resilience to the effects of climate change into infrastructure design
- Aim to make use of acceptable recycled aggregates
- Support the conservation, management and good stewardship of our waterways, urban and rural forests and natural environment within the community

2.4. Governance & Continuous Improvement:

The County is responsible for the creation of a governance structure to develop, implement and manage its *AMS* that ensures all stakeholders are represented, considered and committed to the success of the system.

The County is committed to their responsibility of overseeing a large range of services provided through a diverse portfolio of *Asset*s, on behalf of the community through sound *AM* practices.

The governance structure and roles are outlined in Responsibilities (Section 4).

2.5. Financial Planning & Budgeting:

The County will incorporate *AM* planning into all annual capital and operating budgets/ forecasts and long-term financial plans, including those prepared for W&WW *Asset*s or adopted through Provincial legislation.

The County's *AMS* will be a resource to:

- Identify all potential revenues and costs (including acquiring, constructing, operating, maintaining, replacing, disposing and decommissioning), associated with *Infrastructure Asset* decisions
- Evaluate the necessity and reasonableness of infrastructure acquisitions, including the impact of future operating costs
- Prioritize and monitor forecasted spending obligations identified in the *Asset Management Plans (AMP)* against funding availability to strategically manage potential gaps.
- Establish user fees and development charges based on capital renewal plans and maintain sufficient reserves for sustainable management of infrastructure
- Develop new revenue tools and alternative funding strategies where feasible

2.6. Capitalization Thresholds:

The County will use the following *Capitalization Thresholds* as guidelines for the purposes of *AM*.

- Land/ Land Improvements = $0 (include all)
- Other Infrastructure Assets = $1,250

However, it is important to note that the purpose of *Capitalization Thresholds* for *Tangible Capital Asset (TCA)* financial reporting (i.e. recognizing capital *Asset*s based on monetary value) is different than the purpose of *Capitalization Thresholds* for *AM* (i.e. recognizing capital *Asset*s that will be included in an *AMS,* based on long-term planning and *LOS* requirements).

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As such, the *Capitalization Thresholds* for *AM* will continue to be reviewed as the County's *AMS* develops and thresholds for financial reporting will not be the sole guide for determining capital *Asset*s included in the County's *AMS*.

2.7. Community Planning:

The County will align its *AMS* with Ontario's land-use planning framework, including any relevant policy statements issued under Section 3(1) of the Planning Act, R.S.O. 1990 or successors thereto; will conform with the provincial plans that are in effect on that date and will be consistent with Haldimand County's Official Plan.

The *AMP*'s will reflect community growth projections and land use changes and the impact on related *Asset*s. They will also be cross-referenced with County master plans to ensure that *Infrastructure Asset* decision-making processes and development, support similar *Lifecycle Management* and financial sustainability principles and overall strategic direction.

2.8. Stakeholder Engagement:

The County recognizes the importance of stakeholder engagement as a key component of a successful, holistic *AMS*. As such, the County will promote informed communication with stakeholders through the:

- Provision of opportunities for stakeholders to provide input with respect to *AM* planning
- Co-ordination of *AM* planning for shared or linked *Infrastructure Assets* with neighbouring municipalities and other regulated utilities
- Posting of the County's *AM Policy* and *AMP's* on its public website and making available a copy upon request

2.9. Climate Change:

The County will consider the impact of climate change on *Infrastructure Assets* as part of its *AMS*. This commitment includes the following actions:

- Review of climate change impacts affecting *Infrastructure Asset* service levels, operations and *Lifecycle Management*
- Anticipation of costs resulting from weather-related risks and vulnerabilities through the use of contingency funds
- Consideration of adaptation opportunities available to manage such vulnerabilities
- Development and utilization of disaster planning processes to allow for business continuity
- Acquire or modify *Infrastructure Assets* based on greenhouse gas reduction or other energy efficiency targets

3. DEFINITIONS

Asset[1]	Item, thing or entity that has potential or actual value to an organization. Can be tangible (physical) or intangible, financial or non-financial.
Asset Management (AM)[1]	Co-ordinated activity of an organization to realize value from *Asset*s. All *Asset* types are considered and it includes all activities involved in the *Asset*'s life cycle.
Asset Management Plan (AMP)[1]	Documented information that specifies the activities, resources and timescales required for an individual *Asset* or a grouping of *Asset*s, to achieve the organization's *AM* objectives.

Asset Management System (AMS)	The collection of policies, strategies, plans, processes, procedures, roles, responsibilities and information that establish a municipality's formal approach to *AM*.
Capitalization Threshold	The value that determines whether an *Infrastructure Asset* will be included (above value) or not included (below value) in Haldimand County's *AMS*. (see Section 2.6. for additional information regarding application to this Policy)
Core Public Services	Essential municipal services provided to citizens as required by legislation.
Infrastructure Asset	A non-financial, tangible, municipal *Asset,* primarily for public use or benefit in Ontario and included in Haldimand County's *AMS*. Examples: roads, bridges, culverts, W&WW systems, facilities, fleet vehicles, equipment, software, cemetery features, etc. Also includes green infrastructure such as lands, stormwater systems, waterways, forests, green roofs, etc.
Level of Service (LOS)[1]	Parameters or combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers. Parameters can include safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost and availability.
Lifecycle Management	The process of managing the entire lifecycle of an *Infrastructure Asset* including identification/ feasibility, planning/ design, procurement/ construction, operation/ maintenance and replacing/ disposal, in order to ensure the best total value is obtained.
Strategic Asset Management Plan (SAMP)	Documented information that specifies how organizational objectives are to be converted into *AM* objectives, the approach for developing *AMP*'s and the role of the *AMS* in supporting the achievement of the *AM* objectives.
Tangible Capital Asset (TCA)	A physical *Asset* that has an economic benefit and useful life longer than one accounting period.
[1]: ISO 55000:2014 – International Standard for Asset Management and The Institute of Asset Management, Asset Management – an anatomy (ver. 3), Dec. 2015	

4. RESPONSIBILITIES

Council	• Prioritize effective stewardship of *Infrastructure Assets* in the adoption of the *AM* Policy, Plans, budgets and future updates of these documents (every 5 years). • Support direction and implementation of the *AMS* ensuring *LOS* are established, and sufficient resources and continual improvement practices are in place in order to achieve the municipality's organizational objectives • Approve asset funding to ensure financial sustainability for *AM* through the annual budgets • Act on behalf of and represent the interests of stakeholders and the community*
Chief Administrative Officer (CAO)	• As the Executive Lead, communicate the vision and importance of *AM* at a corporate level • Endorse the *AM* Policy, Plans and System • Act on behalf of and represent the interests of Council and the Corporation*

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Senior Management Team (SMT) & Financial & Data Services Division	• Review and approve *AM* documents and strategies proposed by the *AM* Division • Provide corporate oversight to *AM* objectives, activities and goals and ensure the County's *AMS* aligns with the Corporate Strategic Plan and other documents as noted in References (Section 5). • Provide direction to the *AM* Division with respect to *AM* projects and initiatives • Act on behalf of and represent the interests of their respective departments and the Corporation*
Asset Management Division	• Champion the *AMS* and provide direction to County departments and staff • Oversee *AM* activities and develop, manage and improve components of the *AMS*, including the asset registry, AM analysis/ decision-making tools, construction/ maintenance programs, budget forecasts and required training for County staff • Monitor the progress and performance of the *AMS*, ensuring alignment with corporate and *AM* objectives • Conduct an annual review on or before July 1st of each year and report on the progress and performance of the *AMS* to Council, the CAO and SMT • Receive and distribute *AM* information to County staff and stakeholders • Act on behalf of and represent the interests of County departments*
Divisional Managers	• Direct, manage and support *AM* activities that fall within their respective areas • Provide input and feedback for divisional *AM* activities, including *LOS*, performance indicators and operational/ resource requirements • Act on behalf of and represent the interests of divisional staff*
Divisional Staff	• Perform *AM* activities, including providing/ documenting, updating and improving information for asset registries, performance measures and service levels • Collaborate with the *AM* division in developing *AM* analysis/ decision-making tools, construction/ maintenance programs and budget forecasts
Stakeholders	• Provide input and feedback related to *AM*, including *LOS* requirements, experiences and expectations
* with respect to and in keeping with sound *AM* practices	

5. REFERENCES

In order to achieve a comprehensive, multi-disciplinary and effective *AMS*, the County will ensure that this policy aligns and is integrated with the following Haldimand County documents:

- *Strategic Asset Management Plan (SAMP)*
- Corporate Strategic Plan
- Official Plan
- Other Plans, Strategies, Studies & By-laws, including, but not limited to:
  - Cemetery By-law
  - Corporate design plans and specifications
  - Development Charges Study and By-law
  - Economic Development Strategy
  - Energy Conservation and Demand Management Plan
  - Forestry Strategy and Management Plan
  - Haldimand County Public Library Strategic Plan
  - Haldimand Museums Strategic Plan

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- Haldimand Road Needs Study
- Master Service Plans
- Recreation Master Plan
- Trails Master Plan
- User Fee By-law
- Water & Wastewater Charges By-law

- Long-Term Financial Plans & Funding Policies
- Tax Supported Capital Budget/ Forecast and Tax Supported Operating Budget
- Rate Supported Water & Wastewater Capital Budget/ Forecast and Operating Budget

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REVISION HISTORY					
REPORT	CIC		COUNCIL		DETAILS
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	

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HALDIMAND COUNTY

Report FIN-10-2019 Investment Status Report – December 31, 2018

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To provide Council with information regarding the County's investment position, as at December 31, 2018, and to allocate any surplus or deficit exceeding $100,000 to or from the Investment Income Stabilization Reserve, as well as to report on the Hydro Legacy Fund transactions for 2018, including accrued interest to be applied to that fund.

RECOMMENDATIONS:

1. THAT FIN-10-2019 Investment Status Report be received;
2. AND THAT, in accordance with Section 8.0 of the Cash Management and Investments Policy #2001-11, as revised, $202,557 be allocated from the Investment Income Stabilization Reserve to mitigate investment income fluctuations in the 2018 fiscal year;
3. AND THAT, in accordance with Section 3(b)(i) of the Hydro Legacy Fund Policy #2018-01, the weighted average yield to maturity be set at 3.77% for the purpose of accruing investment interest earnings to the Hydro Legacy Reserve Fund for 2018.

Prepared by: Charmaine Corlis, Treasurer

Respectfully submitted: Mark Merritt, CPA, CA, General Manager of Financial & Data Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The Municipal Act requires that the Treasurer present a report to Council on an annual basis with respect to the performance of the County's investment portfolio, in addition to other specifics as noted below. This report addresses the performance of the County's investment portfolio for the period January 1, 2018 to December 31, 2018. The total unaudited book value of the County's investment portfolio, as at December 31, 2018, is approximately $159.9 million, which is comprised of $67.9 million in fixed income investments, and $92.0 million in growth/equity investments.

The County is required to report the carrying value of its investments (and investment earnings) based on the lower of cost or market, which means any accrued market gains are not reported as income unless the underlying investment is liquidated. "Realized" earnings means actual cash income from the investment which has been deposited with the County. "Market" gains, on the other hand, relate to the growth in the investment portfolio, but the gain has not been received since the investment was not liquidated. Upon review by the Investment Committee and with the assistance/advice of the County's investment manager, the County did not liquidate any of its growth portfolio in 2018. Therefore, cash interest earnings was only realized on the fixed income portfolio for 2018. The realized return on this portion of the portfolio was **3.79%** for 2018, or approximately **$2.6** million of actual cash interest received by the County, net of applicable investment fees.

The County's net investment interest income is allocated annually as follows:

- Apportioned back to interest bearing reserve funds (including the Hydro Legacy Reserve Fund as outlined in CS-GM-02-2018 and described in more detail below) to help offset inflationary pressures when used to fund future expenses;
- Conversely, "funds" in a negative cash position (e.g. Community Vibrancy Fund (CVF), Development Charges) are charged "interfund" interest since we are internally borrowing from other "general fund" sources to cover that fund's expenses in advance of receipt of the related deposits;
- The remaining cash interest received in a calendar year is credited to the County's "general fund" and helps to reduce the annual tax levy. Historically, a budget of $1.6 million in interest income is allocated to the "general fund". Any annual surplus/deficit in the general fund's realized interest income, greater than $100,000, is to be funded from the Investment Income Stabilization Reserve as outlined in the County's Cash Management and Investment Policy.

On March 27, 2018, staff presented report CS-GM-02-2018 Hydro Legacy Fund Policy & By-law. Through that report, Council approved that interest be accrued on an annual basis to the Hydro Legacy Reserve Fund based on a weighted average yield to maturity, which would then be reconciled as longer term investments matured or were liquidated. The County's Investment Committee recently met with the CIBC investment manager to determine what the appropriate weighted average yield to maturity would be based on 2018 performance, as well as to set a projection for 2019. As a result of this analysis and discussion, it is proposed that a full rate of return of **3.77%** be allocated to the Hydro Legacy Reserve Fund for 2018. This is a weighted average of the 3.79% realized return (actual cash received, as noted above) and 2018 market growth of 3.75% on the equity portion of the investment portfolio that will not be realized until the investment is liquidated. Using the 3.77% earnings figure results in total interest earnings of approximately $2.67 million being accrued to the Hydro Legacy Reserve Fund for 2018. The Investment Income Stabilization Reserve will be used to balance the accrual, as outlined in the Hydro Legacy Fund Policy. Even with such an accrual, it is expected that there will still be some gains in the investment return when the growth investments are liquidated in future years. This accrual approach will avoid such future "windfalls" due solely to timing, and will allow utilization of some of the earnings from the Hydro sale proceeds while preserving the principal.

CIBC has a team of advisors which have been managing the majority if the County's investment portfolio since the later part of 2013. This relationship began with the management of the County's bond portfolio, but has grown to involve a more comprehensive and diversified portfolio built upon a relationship of communication and monitoring that is based on CIBC's proven track record in the municipal investment market. Finance staff have regular communication with the CIBC team. The County's investment committee (consisting of the Mayor, Chief Administrative Officer, Chief Financial Officer/General Manager of Financial and Data Services and the Treasurer) meet at least semi-annually with the CIBC team to review the portfolio's performance. In addition, monthly internal investment performance reports are provided to the committee for monitoring. A projected weighted average yield to maturity of **4.03%** is proposed as a target for 2019. This 2019 rate will be what the County uses to benchmark actual performance during 2019.

BACKGROUND:

Legislated Investment Reporting

As provided for under the Municipal Act, the County can invest funds not required to meet current expenditures in accordance with prescribed restrictions and rules. Intended to preserve and protect the security of these public funds, Provincial regulations restrict the nature and term of eligible investments. These regulations require all municipalities to adopt a policy outlining its investment policies and goals.

The County's "Cash Management and Investment Policy" (2001-11, amended in 2016) was enacted to meet the legislative requirements. The County's policy: describes the eligible investments and restrictions; establishes priority objectives of adherence to the statutory requirements; and balances liquidity and cash flow needs with a competitive return on the portfolio of investments. The Policy delegates the authority of control and management of these investments to the Treasurer, with reporting oversight by senior staff, as well as input and advice from the external investment manager.

The County's Investment Policy, as well as legislation, requires the Treasurer to present an investment report to Council on an annual basis. The investment report is to provide the following information:

- a statement related to the performance of the securities held in the investment portfolio;
- estimated proportion of the total investments of a municipality that are invested in its own long-term and short-term securities to the total investment;
- a statement by the Treasurer as to whether or not, in his or her opinion, all investments are consistent with the investment policies and goals adopted by the County.

Staff also continue to indirectly communicate investment performance to Council on a semi-annual basis through the reporting of investment income in the Tax Supported Operating Budget Variance report and the Tax Supported Operating Budget document.

Furthermore, through CS-FI-08-2016 *RE: Investment Status Report and Investment Policy Update*, Council approved the establishment of an Investment Committee consisting of the Mayor, Chief Administrative Officer, Chief Financial Officer/General Manager of Financial and Data Services and the Treasurer. As per revised Policy No. 2001-11 *Cash Management and Investments*, the Investment Committee is mandated to meet *at least* semi-annually to review performance and obtain advice on future trends from the external investment manager. The Investment Committee met formally twice to review 2018 investment performance (once mid-year and once to review the unaudited year end performance). Finance staff also meet regularly with the investment manager to review trends and projected performance.

The intent of this report is to meet the formal reporting requirements of the County's investment policy, as well as to provide Council with an indication of the market value of the investment portfolio.

It should be noted that legislative amendments have been enacted by the Province that have changed some of the eligible investment regulations as well as provided a framework for a "Prudent Investor" status. These regulations came into effect January 2019, requiring a future report to Council in 2019 which will outline the changes, a review of best practices, performance, options and any recommended amendments, if any, to the County's current investment policy.

Hydro Legacy Reserve Fund

Staff Report CS-GM-02-2018 Hydro Legacy Fund & By-law was presented for Council's consideration on March 27th, 2018. In that report, it was recommended that the interest allocated to the Hydro Legacy Reserve Fund be based on the weighted average yield to maturity, not the realized income as is the practice for other interest bearing reserve fund accounts. As longer term investments mature or are liquidated, a reconciliation process will occur to ensure the interest allocated to the Hydro Legacy Reserve Fund is not materially over or understated due to timing. Based on the analysis of the 2018 returns, a weighted average interest earnings rate of 3.77% is recommended to be allocated to the Hydro Legacy Reserve Fund for 2018, as outlined in further detail below.

ANALYSIS:

This investment report reflects activity for the period of January 1, 2018 to December 31, 2018. The County's external investment portfolio is comprised of funds available from reserves, reserve funds and operating funds, as well as the proceeds from the 2015 Haldimand County Utilities Inc. divestiture, the net proceeds of which have been set aside by Council resolution into the Hydro Legacy Reserve Fund. A summary of the County's Investment Holdings, as of December 31, 2018, can be found in Attachment 1.

Provincial regulations establish the type of investments the County can hold, while the County's Investment Policy establishes limits for the allowable types of investments. As of December 31, 2018, the County's portfolio was comprised of holdings ranging from fixed income investments (daily money market instruments, long term bonds and debentures, as well as principal protected notes with an annual fixed income) and growth income investments (equity related principal protected notes). The total unaudited book value of the holdings, as at December 31, 2018, was $159.9 million compared to a book value of $170.9 million at December 31, 2017. The 2018 year end book value is comprised of approximately $67.9 million in fixed income investments, compared to $78.9 million in 2017, while the 2018 growth/equity year end book value remain equivalent to 2017 year end of $92.0 million. Of the $159.9 million 2018 year end investment portfolio balance, approximately $79.9 million (50%) pertains to the monies held in the Hydro Legacy Reserve Fund.

In accordance with the requirements of the Municipal Act, in the opinion of the Treasurer, all investments held during 2018 were consistent with the investment policies and goals adopted by the County.

Fixed Income Investment Performance – 2018

The fixed income investment earnings, comparing 2018 to 2017, are summarized as follows, and are limited to the County's external investment portfolio so do not include any inter-fund interest allocation (i.e. allocation between operating fund, capital funds or reserve funds):

Table 1 – Realized Fixed Income Performance

	2018 Unaudited Realized Income Returns					2017 Audited Realized Income Returns			
	Year End Book Value (million)	Percent of Portfolio	Realized Earnings	Average Yield (%)		Year End Book Value (million)	Percent of Portfolio	Realized Earnings	Average Yield (%)
Fixed Income Investments	$ 67.87	42%	$ 2,644,721	3.79%		$ 78.87	46%	$ 2,542,258	3.13%

Note 1 – Yields for individual holdings within each category above vary based on the timing of purchase and the maturity date.

Note 2 – Annualized average yield to December 31

Note 3 – All earnings are net of investment fees

Short term investments included under Fixed Investments include cash. Cash is held under an interest bearing account that provides an interest rate of Monthly Average Prime (MAP) less 1.75% or 2.00% depending on the cash balance.

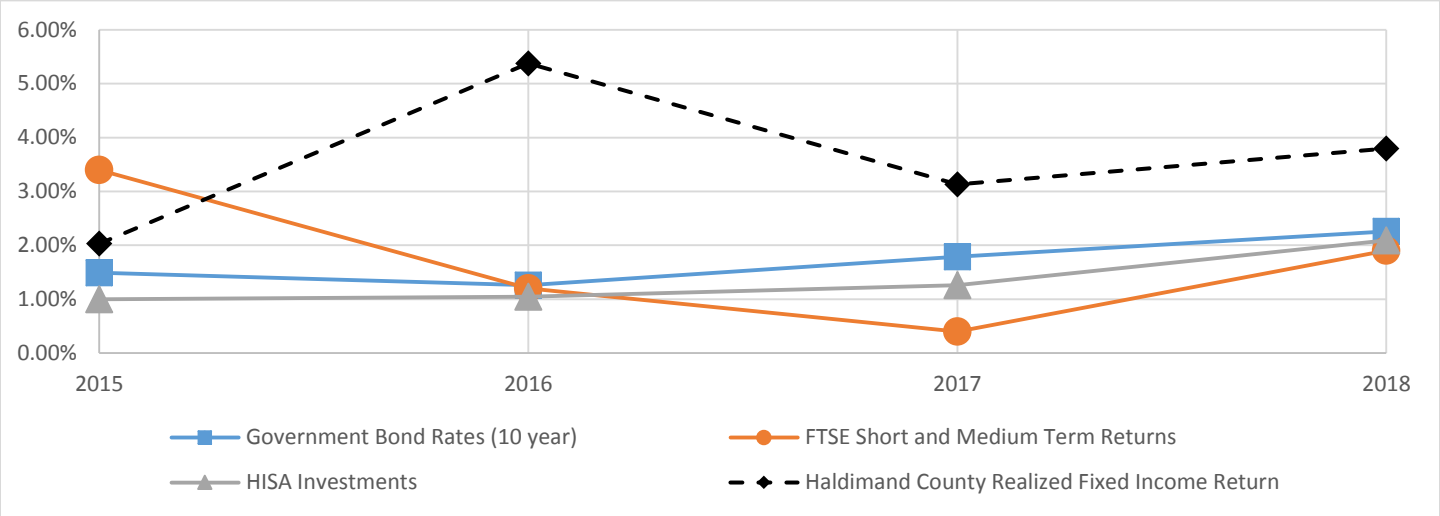
From Table 1 above, it can be seen that $67.9 million or 42% of the entire investment portfolio was in fixed income investments in 2018, with actual cash realized earnings of approximately $2.6 million, or 3.79%. The remainder of the County's $159.9 million portfolio is held in growth income investments, as outlined in Table 2. It should be noted that the 2018 the average yield of 3.79% was strong, particularly compared to related benchmarks, as discussed below.

Chart 1 below compares the County's actual annual return on the fixed income portfolio to a set of industry benchmarks. These benchmark indices are recommendations from our external investment manager to compare the performance of County's current investment returns to the following: the

Government Bond 10 year-over-year average; the Financial Times Stock Exchange (FTSE) TMX Canada Short-Term Bond Index (this index is a broad measure of Canadian one to five year term bonds); and the One Fund High Interest Savings Account (HISA) offered to municipalities as provided under Provincial legislation.

This continues to show that Haldimand's realized investment income is positive in 2018. It should be noted that in 2016 the County realized substantial income from liquidating a strip bond that it held for quite some time, thus resulting in a larger than average yield for 2016.

Chart 1 – Realized Fixed Income Performance Compared to Benchmarks



Growth Income Investment Performance – 2018

Growth income performance relates to growth in the value of the investment portfolio, but the gain has not been received since the investment was not liquidated or did not mature. The following table displays the market growth in the County's investment portfolio between December 31, 2017 and December 31, 2018:

Table 2 – Growth Income Investment Performance

	2018 - Market Growth					2017 Market Growth				
	Portfolio Balance (million)	Market Value Balance (million)	Market Growth (million)	Market Return at December 31, 2018	WAYM* Recorded	Portfolio Balance (million)	Market Value Balance (million)	Market Growth (million)	Market Return at December 31, 2017	WAYM* Recorded
Growth/Equity Investments	$ 92.00	$ 93.77	$ 1.77	1.92%	3.77%	$ 92.00	$ 101.59	$ 9.58	10.42%	4.34%

*WAYM=Weighted Average Yield to Maturity

Table 2 provides details regarding the 2018 and 2017 performance of Growth Income Investment portfolio. The table provides a comparison of Market Growth and the Weighted Average Yield to Maturity (WAYM). The growth portfolio can be affected positively and negatively from market conditions. As you can see above, the December 2018 Market Growth experienced a decline over 2017 (1.92% versus 10.42%). However, as of May 1, 2019, the market rebounded, resulting in a 10.41% market growth, and growth continues to be solid, with earnings expected to continue to improve.

The Market Growth above reflects investment value increases as of December 31st. As previously mentioned, a substantial portion of the invested funds will not generate income until maturity or sold, it is important to recognize these changes in value over the life of the investment. Realized and unrealized gains or losses are based on the difference between the cost (book) and market value (current market price) of securities at any point in time.

As per the Hydro Legacy Fund Policy #2018-01, the Weighted Average Yield to Maturity (WAYM) is determined annually, by the Investment Committee, based on advice from the external Investment Manager on the performance to date of the overall investment portfolio and expected future market conditions. Establishing a benchmark rate for the purpose of accruing unrealized earnings for the Hydro Legacy Reserve Fund, will help avoid significant reconciliations in future years.

For 2018, included in Table 2, the Growth Income Investments resulted in a 3.77% WAYM, which will be recorded as a year-end accrual for the Hydro Legacy Reserve Fund, however, the 2018 projected WAYM benchmark was projected at 4.88%. This variance is primarily due to higher estimated returns in 2017 resulting in lower revenue recognition in 2018. The WAYM benchmarking for 2019, after review by the committee and taking into account actual holdings at May 1, 2019, is recommended to be set at 4.03%.

It is critical to note that the market growth shown in the table above has not been realized (cash not yet received) as the related investments have not matured, thus creating the return. Significant cash inflows are expected in future years when any of the individual notes comprising this portion of the investment portfolio are liquidated or mature.

Chart 2 – Growth Income Investment Performance Compared to Benchmarks

	2017	2018
One Fund Investment (split equally between Bond Portfolio, Corporate Bonds, Canadian Equity)	3.97%	1.88%
Bank of Canada 10 Year Bond (average yearly return, 2017-present)	1.79%	1.91%
TSX Composite Index (average yearly return, 2017-present)	9.10%	-0.85%
Haldimand County WAYM (Realized and Unrealized Earnings)	4.34%	3.77%

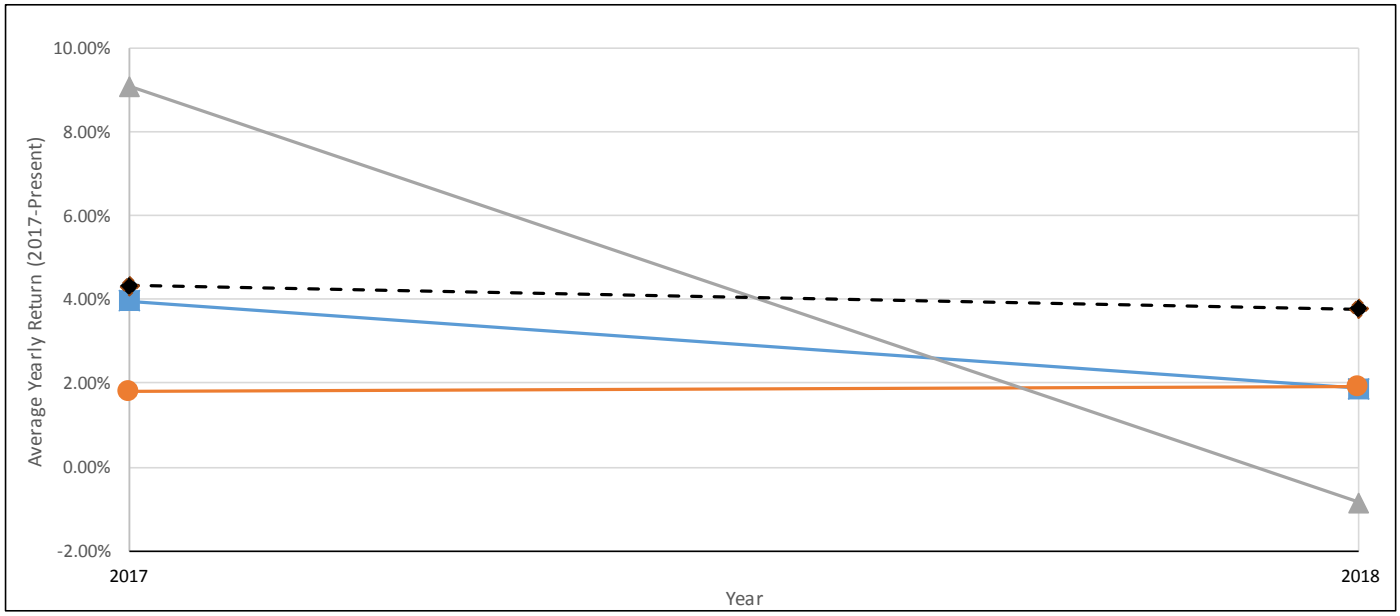


Chart 2 above compares the County's WAYM Growth Income of over the past 2 years (returns in 2017 were 4.34% and 2018 was 3.77%) to a set of selected industry benchmarks. These benchmarks were selected based on a review of industry standards and recommendations from our external investment Manager. These indices reflect performance of other available municipal investment options and comparison to a well established stock composite index. The performance of the One Fund Investment program is based on the average annual returns of their three main growth related investment products. The Bank of Canada returns reflect the average yearly return on a 10 year Bank of Canada bond. It should be noted that these indices are also used to benchmark the One Fund's annual investment returns. Although the 2018 WAYM results were lower than the internally establish benchmark by the Investment Committee, the County's overall investment performance exceeds the investment market

comparators and generally has well performed over the past two years – despite a significant market decline at the end of 2018.

External Investment Manager

In late 2013, the County obtained investment management services from CIBC. Given the size of the investment portfolio at the time, as well as the pending increase in available funds from the sale of Haldimand County Hydro, staff determined it was prudent to utilize an external investment management team as the County did not have the in-house resources and expertise to manage such a large investment portfolio. This allowed staff to deal directly with one broker and better manage cash flows and timing of transfers in and out of our investment portfolio.

When the County received the proceeds from the sale of Haldimand Hydro, the available investment portfolio nearly doubled to over $145 million. This precipitated a review of the County's portfolio mix, eligible investments and use of external fund managers. County staff met with several investment fund managers (current CIBC manager, Association of Municipalities Ontario (AMO)/Local Authority Services (LAS's) One Investment Program, TD Wealth Private Investment, BMO Nesbitt Burns, Raymond James and Meridian Credit Union) to review their product mix offerings and projected market returns. Both CIBC and the One Investment Program made formal presentations to the now formally established "Investment Committee". Based on this review, available products and proposed portfolio mix, it was recommended to continue to utilize CIBC and to move to a more balanced investment mix, which included making investments into Principal Protected Notes (PPNs) – both Fixed Income and Equity.

The recommended portfolio mix required the current Investment Policy to be updated and approved by Council in the spring of 2016. The main revisions to the County's policy were as follows:

- Authorized Investment Limits/Mix and Individual Issuer Limitations
- Ability to Invest in the *One Investment Program* to allow for investment in Canadian Bonds and Equities
- Provision for establishment of an Investment Income Stabilization Reserve
- Establishment of an internal investment committee, consisting of the Mayor, Chief Administrative Officer, Chief Financial Officer/General Manager of Corporate Services and Treasurer
- Requirement to report annual investment returns in comparison to selected benchmarks

When considering the need for a secure, yet attractive return, from the investment of public funds, some of the key features of CIBC deposit notes (PPNS) include:

- Capital Preservation – 100% principal protection at maturity with CIBC issuer guarantee
- Diversification – Can be linked to a variety of asset classes including equities
- Enhanced Income and/or Growth Potential – can be designed to generate minimum guaranteed returns, enhanced income or long-term growth potential
- Asset/Liability Matching – Ensure the availability of sufficient capital to meet future funding obligations over defined time horizons
- Liquidity – Daily secondary market (which could result in a value above or below par if the Deposit Notes are liquidated prior to maturity.)

Some additional factors that led to the selection of CIBC as the portfolio manager were:

a) CIBC has a track record of investment expertise including:
   - they have the longest running secondary market for Structured Notes in Canada and their secondary market has been open every day since the notes program began, with the exception of September 11, 2001;
   - they issued their first Structured Note in 1994 and have originated more than $20 billion in notes to date;
   - they were named Canada Derivative House of the Year (the 2014 & 2015 Global Capital Derivatives Awards);

- #1 in Structure Products Market Share (Brendan Wood International 2015 Investment & Corporate Banking World Watch).

b) The team at CIBC offers a number of key services that prove them to be the best fit with the County, at this time:
   - Specialization in the development of municipal investment products that are tailored to specific market views and risk tolerances;
   - The ability to invest in principal protected notes (PPNS) that not only improve portfolio diversification, they provide full principal protection at maturity. They may also generate higher potential return than traditional fixed income investments;
   - CIBC Deposit Notes combine key fixed income and equity investments. They rank equal to CIBC bank deposit and qualify as eligible investments under the Municipal Act.

Although the revised investment approach is relatively new, staff are very satisfied with both the performance to date and the services provided by CIBC. Regular internal reporting and meetings with the external advisors will ensure that the investment portfolio is meeting the County's objectives.

Hydro Legacy Reserve Fund Reporting:

Section 3(e) of the Hydro Legacy Fund Policy #2018-01 outlines the reporting requirements related the Hydro Legacy Reserve Fund.

Under this section of the Policy, the Treasurer is required to report to Council, at least annually, on the financial position of the Hydro Legacy Fund. This report must:

- Review the investment performance and earnings related to this Fund, including market versus realized gains/losses, as well as a reconciliation of actual to accrued earnings from prior periods;
- Outline the recommended benchmark interest rate for accruing of investment income to this Fund for the coming year;
- Provide an accounting of all transactions, with specific details, affecting this Fund;
- Outline any transactions affecting the litigation allowance (originally set at $7 million);
- Outline the projected maximum amount of investment earnings that could be considered for use in the upcoming budget, based on the priorities and parameters stipulated in the Policy; and
- Include any other information pertinent to the Hydro Legacy Fund as deemed appropriate.

Section 3(e) also stipulates that Haldimand County's website will contain a section devoted to the Hydro Legacy Fund where the public may access:

- Information regarding the Hydro Legacy Fund Policy;
- Any associated reports, including the above-noted Treasurer's financial reports;
- Notice of projects funded by the Hydro Legacy Fund, with a focus on promotion and awareness of such benefit;
- Public notice of any meeting whereby users of the Hydro Legacy Fund or changes to the Hydro Legacy Fund Policy will be considered; and
- Any other relevant information.

The information noted above will also be publicized through the County's social media network, as well as in local newspapers, and specific signage at capital project locations, as deemed appropriate.

An unaudited statement showing all of the transactions affecting the Hydro Legacy Fund, to the end of 2018, is presented as Attachment 2 of this report.

FINANCIAL/LEGAL IMPLICATIONS:

As noted in Table 1, actual cash investment earnings realized in 2018 amounted to **$2,644,721** (unaudited.) The allocation of this cash income is as follows:

Interest bearing reserve funds (excluding Hydro Legacy Reserve Fund)	$ 0.80 million
Hydro Legacy Reserve Fund interest (earned)	$ 1.27 million
Interest expense charged on unfinanced capital	$ (0.20 million)
Interest expense charged on Community Vibrancy Fund timing deficit	$ (0.44 million)
Miscellaneous interest expense	$(0.08 million)
General Tax Supported Interest Income (remaining balance)	$ 1.30 million

It should be noted that, although some of the Reserve Funds are in negative balances (i.e. internally borrowed from other sources), the internal interest rate achieved is greater than interest earnings that could have been achieved from available benchmark investment options. In fact, in most cases, the interest returns exceed the underlying borrow rates if the County had borrowed the funds externally.

Some of the significant factors affecting the above include:

- Strong results in the County's fixed income portfolio
- No liquidation in the County's equity/growth income portfolio
- The allocation of interest earnings to various interest-bearing reserve funds at a rate equal to the average investment earning

General Tax Supported Interest Income

The 2018 interest income related to the County's general fund (unallocated) was budgeted at $1,600,000 (including inter-funding), whereas this fund's share of the remaining balance equated to $1,297,443 (per above) leaving an overall projected deficit of $302,557. It should be noted that this actual cash interest income is realized only on the fixed income portion of the portfolio, meaning it does not reflect any market earnings which can be expected in future years, given that over 50% of the portfolio is in growth/equity investments.

The Investment Policy requires variances in investment earnings, greater than $100,000, to be transferred to or from the Investment Income Stabilization Reserve so a transfer of approximately $203,000 will be made in 2018. The purpose of this reserve is to mitigate the impact of annual fluctuations in investment returns, particularly due to the timing of liquidating the growth/equity investments.

There are a number of factors that come in to play when analyzing the performance on the County's investment portfolio. These factors include:

- *liquidation*: In order for the County to meet its short term cash obligations, a critical characteristic of the investment portfolio is the existence of liquidity. This limits the County's ability to invest more of its portfolio in longer term, higher yielding instruments;
- *market conditions*: Similar to all investors, the County's investment portfolio may be affected, either positively or negatively, by the market conditions at any given point in time;
- *timing*: An important aspect to take into account when examining the performance of the County's investment portfolio is timing. Given the magnitude of the portfolio, particularly since the sale of Haldimand County Hydro, the County relies heavily on its external investment manager, CIBC, to keep abreast of the market conditions. County staff are in regular contact with the external investment manager and the County's Investment Committee meets with CIBC to ensure the County's resources are being managed effectively and that the portfolio is achieving the best returns possible.

Hydro Investment Earnings

Through CS-GM-02-2018, Council approved the Hydro Legacy Fund Policy. Contained in this Policy is the requirement for market earnings to be accrued to the Hydro Legacy Reserve Fund based on an average weighted yield to maturity, starting in 2017.

The annual market yield to be accrued to the Hydro Legacy Reserve Fund is to be determined by the Investment Committee, with advice from the external investment manager. Based on these requirements, the Investment Committee met with the external investment manager and determined that a weighted average yield to maturity of **3.77%** should be accrued to the Hydro Legacy Reserve Fund for 2018. This results in a total interest allocation of $2,666,840 for 2018 – of which $1,272,688 is Hydro's share of the realized income and $1,394,152 is to be accrued and later reconciled as the related growth income matures or is liquidated (as per the terms of the Hydro Legacy Fund Policy).

The accrued income allocated to this Fund will be offset by the Investment Income Stabilization Reserve as per the Hydro Legacy Fund Policy. As per the policy, it can be expected that there will be a difference between the accrued and realized gains and accrued market growth on these investments from the initial purchase which will be recognized in future years when these investments are either liquidated or they mature - the recording of which will be part of the annual interest reconciliation process.

Investment Income Stabilization Reserve

Currently, the Investment Income Stabilization Reserve is utilized for two key functions: to smooth out any annual surplus/deficit in the realized investment income in excess of +/-$100,000, and to allow for the allocation of accrued interest to the Hydro Legacy Reserve Fund, which is then reconciled as longer-term income is realized, as per the terms of the Hydro Legacy Fund Policy.

As at December 31, 2017, there was a negative balance in the Investment income Stabilization Reserve of ($1,732,725). Based on the information presented within this report, the estimated balance of this reserve at December 31, 2018 is anticipated to be approximately ($3,329,434), as outlined below:

2018 Unaudited Investment Income Stabilization Reserve Balance:

Opening balance, January 1, 2018	($1,732,725)
Less: Operating Investment income deficit in excess of $100,000	($202,557)
Less: Accrued income allocated to Hydro Legacy Fund	($1,394,152)
Ending Balance, December 31, 2018	**($3,329,434)**

Though the balance is currently projected to be in a negative position, under the terms of the Hydro Legacy Fund Policy, as the County's longer term investments mature or are liquidated, the annual accruals associated with the Hydro Legacy Fund are to be reviewed and reconciled. Over time, it is anticipated that there will be significant positive contributions to the Investment Income Stabilization Reserve as these longer time investments mature.

Growing Communities Fund

Council approved a maximum annual transfer of $750,000 from the Hydro Legacy Fund's investment earnings to the Growing Communities Fund, conditional on being compliant with Section 3(c) (ii) of the Hydro Legacy Fund Policy, which states that any contributed amount towards the cost of major assets/infrastructure that benefit Haldimand County cannot exceed 60% of the year's net investment earnings (realized and unrealized), after deducting the sum first needed for inflation/annual indexing protection.

After deducting the interest allocated to the annual indexing of the principal balance, totaling $3.5 million, there are no interest funds remaining. As such, the maximum $750,000 annual transfer noted above is not compliant with the terms of the Hydro Legacy Fund Policy, and the transfer from the Hydro Legacy Reserve Fund to the Growing Communities Fund is not eligible for 2018.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Summary of Investment Holdings as of December 31, 2018
2. Draft Hydro Legacy Reserve Fund Statement

Portfolio Book Value Balance as at December 31, 2018

Asset Class	2018			Minimum	Target	Maximum
	Year of Maturity	Balance ($ million)	%			
Cash:						
Bank	n/a	8.02				
High Interest Savings	n/a	0.41				
Total Cash		8.43	5.27%	1.25%	3.75%	25.00%
Canadian Fixed Income:						
Bonds (1-5 year):						
Canadian Bonds	2023	2.17				
Provincial Bonds	2023	6.43				
Chartered Banks	2023	5.85				
Total Bonds:		14.44				
CIBC Canadian Equity Guaranteed Yield Deposit Notes - 2016 Recommended List (ADP-5011416)	2022	30.00				
CIBC Canadian Equity Guaranteed Yield Deposit Notes - 2017 Recommended List (ADP-5BRWDW0)	2024	10.00				
CIBC Canadian Banks Coupon Deposit Notes (ADP-5011412)	2023	5.00				
Total Canadian Fixed Income		59.44	37.18%	38.75%	50.75%	70.00%
Total Fixed Income		**67.87**	**42.45%**	**40.00%**	**52.00%**	**75.00%**
Canadian Growth/Equity Income:						
CIBC Canadian Banks Growth Deposit Notes (ADP-5011419)	2022	40.00				
CIBC Canadian Index Growth Deposit Notes (ADP-5011423)	2022	10.00				
CIBC Canadian Blue Chip Growth Deposit Notes (ADP-5BRYLN4)	2023	12.00				
CIBC Canadian Blue Chip Growth Deposit Notes (ADP-5CDPTY3)	2024	15.00				
Total Canadian Growth/Equity Income		77.00				
CIBC U.S. Blue–Chip Growth Deposit Notes (ADP-5CDPTY2)	2023	5.00				
CIBC European Index Growth Deposit Notes (ADP-5BRYLN7)	2023	10.00				
Total Growth/Equity Income		**92.00**	**57.55%**	**25.00%**	**48.00%**	**60.00%**
Total Portfolio		**159.87**	**100.00%**			

For further details on note performance, please visit https://notes.cibc.com/#/previouslyissued and search using the ADP Codes provided

The Corporation of Haldimand County
Hydro Legacy Fund
Statement of Activities 2015-2018

January 1st to December 31st	**2015 ($)**	**2016 ($)**	**2017 ($)**	**2018 ($)**
Hydro Legacy Fund Balance				
Principal Protected Balance				
Opening Principal Protected Balance		65,604,799	65,382,419	67,291,586
Transfer to/(from) Reserve	72,604,799	(222,380)	-	
Less HCUI Litigation Fund	(7,000,000)			
Indexing of Principal Protected Balance			1,909,167	3,502,630
Ending Principal Protected Balance	**65,604,799**	**65,382,419**	**67,291,586**	**70,794,216**
Litigation Allowance Balance				
Opening Litigation Allowance Balance		7,000,000	6,850,000	6,850,000
Transfer to/(from) Reserve	7,000,000	(150,000)	-	-
Ending Litigation Allowance Balance	**7,000,000**	**6,850,000**	**6,850,000**	**6,850,000**
Ending Principal Balance (excluding uncommitted interest earnings)	***72,604,799***	***72,232,419***	***74,141,586***	***77,644,216***
Uncommitted Interest Earnings Balance				
Opening Uncommitted Interest Earnings Balance		28,766	2,329,098	3,355,901
Realized Interest Earnings	778,766	2,800,332	1,104,283	1,272,688
Accrued Interest Earnings Based on Estimate Market Value Growth			2,131,687	1,394,152
Interest Reconciliation of Actual Interest Earnings			-	-
Subtotal, Interest Earnings	778,766	2,829,098	5,565,068	6,022,741
Indexing of Principal Protected Balance			(1,909,167)	(3,502,630)
Transfers from Reserve for Municipal Operations	(750,000)	(500,000)	(300,000)	(300,000)
Transfer from Reserve to Growing Communities Reserve Fund				-
Ending Uncommitted Interest Earnings Balance	**28,766**	**2,329,098**	**3,355,901**	**2,220,112**
Closing Hydro Legacy Fund Balance - December 31st	**72,633,566**	**74,561,517**	**77,497,487**	**79,864,327**

Statement of Continuity				
Revenues:				
Realized Interest Earnings	778,766	2,800,332	1,104,283	1,272,688
Accrued Interest Earnings Based on Estimate Market Value Growth			2,131,687	1,394,152
Interest Reconciliation of Actual Interest Earnings				
HCUI Audit/Tax Recovery	74,467			
Hydro Proceeds	73,265,957			
Total Revenues	74,119,190	2,800,332	3,235,970	2,666,840
Less Expenses:				
Hydro Divestiture Closing Costs	(735,625)	(7,632)		
Water/Wastewater Billing Conversion Costs		(214,748)		
Lawsuit Settlement (CS-GM-08-2016)		(150,000)		
Municipal Levy Offset	(750,000)	(500,000)	(300,000)	(300,000)
Transfer to Growing Communities Reserve Fund				-
Total Expenses	(1,485,625)	(872,380)	(300,000)	(300,000)
Net Contribution to Hydro Legacy Fund	**72,633,566**	**1,927,952**	**2,935,970**	**2,366,840**
Opening Hydro Legacy fund Balance	**-**	**72,633,566**	**74,561,517**	**77,497,487**
Ending Hydro Legacy Fund Balance	**72,633,566**	**74,561,517**	**77,497,487**	**79,864,327**

**Note: as the Hydro Legacy Fund Policy was created in 2017, accrued income is reflected only for 2017 onward. Interest would have also been accrued to 2016 under the same principles if the Policy were in place at that time. As a result, the accrued income prior to 2017 will be allocated in future years.*

HALDIMAND COUNTY

Report FIN-11-2019 Annual Tax Policy Report

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To provide recommendations for property tax policy decisions that must be made by Council for the 2019 taxation year.

RECOMMENDATIONS:

1. THAT Report FIN-11-2019 Annual Tax Policy Report for the Year 2019 be received;
2. AND THAT the 2019 Tax Rations be set at:

Property Class	Tax Ratio
Multi-Residential	2.0000
Multi-Residential (New Construction)	1.0000
Commercial	1.6929
Landfill	1.6929
Industrial	2.3274
Pipeline	1.4894
Farmland	0.2500
Managed Forest	0.2500

3. AND THAT tax rate reductions for vacant and excess land, within the commercial and industrial classes, be applied as follows for 2019:

Property Class	Tax Rate Reduction
Commercial/Landfill	15.00%
Industrial	17.50%

4. AND THAT Haldimand County adopt the optional subclasses for small-scale on-farm business for both the commercial and industrial subclasses and the prescribed tax reductions be applied as follows for 2019:

Property Class	Tax Rate Reduction
Commercial	75.00%
Industrial	75.00%

5. AND THAT tax rate reductions for farmland awaiting development be applied as follows:

Property Class Tax Reduction
Residential Farmland Awaiting Development – First Class 25.00%
Multi-Residential Farmland Awaiting Development – First Class 62.50%
Commercial Farmland Awaiting Development – First Class 55.70%
Industrial Farmland Awaiting Development – First Class 67.78%
All Classes Farmland Awaiting Development – Second Class 0%

6. AND THAT the rebate percentage for the purpose of the vacant unit tax rebate program be established as follows:

Property Class	Rebate Percentage
Commercial/Landfill	0% (no program available)
Industrial	0% (no program available)

7. AND THAT any amount required to fund the cap for multi-residential, commercial and industrial classes be funded from within the same property class, if sufficient funding is available within the class;
8. AND THAT if sufficient funds are not available within any property class to fund the cap, the shortfall be charged as an expense against the 2019 Tax Supported Operating Budget for capping adjustments;
9. AND THAT Haldimand County adopt the optional tax policy provision for 2019 to exclude properties in the business tax class, which are at their Current Value Assessment (CVA) tax levels, from the capping and clawback program;
10. AND THAT Haldimand County adopt the maximum limit for an assessment related tax increase at 10% and a maximum threshold limit at $500;
11. AND THAT Haldimand County implement the technical adjustment for the notional tax rate calculation prescribed in the property tax related regulations made under the Municipal Act, 2001;
12. AND THAT the resulting 2019 tax rates, as identified in Attachment #1, be adopted;
13. AND THAT the appropriate By-laws be passed to give effect to the above.

Prepared by: Chris Everets, Senior Financial Analyst

Reviewed by: Charmaine Corlis, Treasurer

Respectfully submitted: Mark Merritt, CPA, CA, General Manager of Financial & Data Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The overall property tax impact in a calendar year is affected by four main factors: assessment Impacts; Education tax rates, municipal levy requirement and tax policy decisions. During the review and approval of the 2019 Tax Supported Operating Budget, the impacts of re-assessment, estimated Provincial Education tax rates and the levy requirements for 2019 were factored into the estimated tax impacts on the average assessed properties in the major tax classes. The Education tax rates were not final at that time and the impacts of tax policy decisions, as outlined in this report, were not established (although all tax policy decisions made in 2018 applicable for 2019, were utilized for the analysis of tax impacts).

Subsequent to the analysis provided within the 2019 Draft Operating Budget, all Education tax rates were approved by the Province at a slightly lower rate than the estimates used in the budget, for all classes – this will have a favourable impact on the overall tax impact of all tax classes. Like 2018, where the Province enacted limited tax legislative changes, there are limited changes from the year over year impacts on the various property classes reflected within the 2019 Tax Supported Operating Budget document.

The major tax policy decisions/recommendations included in this report are as follows:

- Adjustments to the returned assessment roll: The County received and processed adjustments to the returned roll from January 1st until May 6th totaling a net reduction of taxable assessment of approximately $1.5 million or 0.02% of total taxable assessment. Due to a large shift from Residential assessment to the Farmland tax class (currently taxed at 25% of the Residential tax rate), the overall impact is approximately a reduction of $9.0 million in assessment. This shift will increase the overall tax impact for all tax classes. Impact: increased municipal tax impact
- Amended "notional tax rate" calculation: Based on the revised methodology for calculating the "notional tax rate", the apportionment of overall tax impacts between re-assessment impacts and levy increase impacts has shifted slightly to reflect more of a re-assessment impact. Impact: no municipal tax impact
- Although it does not have a direct tax impact on any specific class, for 2019, staff recommend that the County adopt all available capping options for the non-residential classes, as allowed by the Province, in order to exit the tax capping requirements as soon as possible. Currently, only the multi-residential tax class has been eliminated from the capping requirements, leaving 7 properties - 2 in the industrial class and 5 in the commercial class. Impact: no municipal tax impact
- Starting in 2018, municipalities were able to establish optional small-scale on-farm business subclasses for qualifying assessment in the industrial and commercial tax classes. Council adopted both of these eligible subclasses to support local farmers and to help diversify their operations from an economic development standpoint in 2018. These optional subclasses will provide some moderate tax relief while spurring growth in the local economy. Impacts: at this time, there have not been any properties assessed in either of the optional subclasses. However, future budgets can be amended if necessary to address the impacts of the optional subclasses.

Relative to the estimated tax impacts presented during approval of the 2019 Tax Supported Operating Budget, the following table outlines the changes and estimated overall annual tax impacts based on the final Education rates and the impact of the tax policy decisions/recommendations outlined in this report and highlighted above:

Property Class	2019 Average Assessed Value	Estimated 2019 Annual Tax Impact as reflected in the Approved Budget		Actual 2019 Annual Tax Impact Based on the Recommended Tax Policy	
		$	%	$	%
Industrial	$529,805	$50.54	0.25%	$(151.13)	(0.76)%
Multi-residential	$1,048,071	$(22.27)	(0.09)%	$(16.80)	(0.07)%
Commercial	$307,271	$178.50	1.98%	$148.76	1.65%
Residential	$266,860	$70.60	2.23%	$68.63	2.16%
Farm	$371,600	$93.97	9.08%	$93.28	9.01%

Based on the tax policy recommendations reflected in this report, the revised overall tax impact on an average residential property has decreased to 2.16% from the 2.23% impact presented at the time of the budget approval. This change is due primarily to actual education rates being lower than projected education tax rates used to estimate the impact on an average assessed property during the budget process.

The 2019 Tax Ratio By-law and related Tax Policy By-laws will be presented at the June 24, 2019 Council meeting to incorporate Council's decisions. Final 2019 tax bills for all Haldimand County property owners will be issued approximately mid-July, with installment payments due on August 30th and October 31st.

BACKGROUND:

The overall property tax impact in a calendar year is impacted by four main factors: annual assessment impacts; Education tax rates, municipal levy requirements and tax policy decisions. The Municipal Property Assessment Corporation (MPAC) establishes property assessments for all properties in the Province of Ontario. MPAC establishes the property classes and assessment on an annual basis based on the market value at a set date. These assessments are set on a four year cycle with 2019 representing the third year of the four year cycle based on a valuation date of January 1, 2016. As a result of this re-assessment, as outlined in report FIN-03-2019 Analysis of Assessment update, there are assessment shifts between property tax classes (as well as in-class shifts) that will shift the 2019 tax burden amongst the County's property owners (for example, significant increases to farm assessed values). This shift has nothing to do with County decisions and the County has no control over these assessment shifts.

In early April, Council reviewed and approved the 2019 Tax Supported Operating Budget which established the annual property tax levy requirement. During this review, the overall municipal tax levy was established at $67,225,340 representing an increase of $3,467,950 or 5.4%. The impacts on the average assessed property in each tax class was estimated, at that time, subject to the approval of the Education tax rates and annual setting of tax policies.

The Province has recently established the annual Education tax rates that are typically aligned with the re-assessment impacts. As a result, as reassessments increase, the corresponding Education tax rates are reduced accordingly. The Province has established the Education tax rates for 2019 that have resulted in decreased rates for all property tax classes ranging from a reduction of 5.5% in the commercial/industrial new construction classes to a 3.7% reduction in the industrial tax class.

Now, the final step is to establish the County's 2019 Tax Policy which will be reflected in the Levying By-law. The Municipal Act includes a number of Tax Policy "tools" available to Council. Tax policy decisions will impact the tax classes differently, with a favourable impact on one tax class typically having a corresponding negative impact on other tax classes. The Province also concluded a comprehensive Municipal Act review in early 2017 that resulted in several "new" tax policy tools; many effective in 2017 and some in 2018. These "tools" provide municipalities with some flexibility in establishing tax policies, within the eligible provisions, to meet their own local circumstances. The major tools/policy decisions to be considered by Council for 2019 are as follows:

Mandatory Programs

- Limit on municipal budgetary increases for commercial, industrial and multi-residential classes if the Tax Ratio for the class is above the Provincial municipal levy restriction threshold
- Ability to adjust (lower) Tax Ratios closer to the Provincial range of fairness
- Capping of the "adjusted" taxes for commercial, industrial and multi-residential classes, funded either by internal revenues, the general levy or by withholding decreases from other properties in the same class
- Permanent program for relief for low income seniors and low income disabled persons
- Tax rebates to registered charities
- Phase-in of tax increases as a result of re-assessment (legislated four year phase-in of assessment increases)
- Restricting municipal ability to increase taxes on multi-residential properties if the tax ratio is greater than 2.0 (*new in 2017 and Council approved a tax ratio of 2.0*)
- Creation of a new multi-residential property tax class to ensure all municipalities tax new multi-residential buildings at a similar rate as other residential properties (*new in 2017 and Council approved a tax ratio of 1.0*)

- Creation of a new landfill tax class with the upper tax ratio limit of the greater than: revenue neutral ratio plus 5% or 1.1 (*new in 2017 and Council approved a tax ratio at the same ratio as other commercial properties of 1.6929*)
- Amendment to *Assessment Act* exempting land occupied by an Ontario Branch of the Royal Canadian Legion, where previously council had approved a 100% tax rebate for Legions under Policy 2001-26 Tax Rebates to Charitable or Similar Organizations

Optional Programs

- flexibility on establishing tax rebates for vacant commercial and industrial properties (new in 2017 and Council established a phase-out plan for these programs over the next 2 years – starting in 2019 the County will no longer have a vacant unit tax rebate program)
- establish reductions for vacant industrial and commercial tax classes other than the prescribed percentages (new in 2017 and Council established a phase-out plan for these programs over the next 4 years – starting in 2021 the County will no longer have a vacant land tax reduction program for these tax classes)
- Charitable tax rebates extended to similar organizations
- ability to establish optional property classes
- ability to establish graduated tax bands
- phase-in of tax increases as a result of re-assessment
- mitigation of tax shifts as a result of re-assessment
- education tax "room" to offset municipal tax increases
- greater flexibility for capping of the "adjusted" taxes for commercial, industrial and multi residential classes
- reduce tax ratios on property tax classes where the current ratio is above the Provincially established range of fairness
- establish farm tax ratio at lower than the Provincially established rate of 25%
- setting of tax ratios to offset the municipality's share of the cost of charitable rebates on properties in the commercial and industrial classes
- provisions for tax relief for people in hardship
- business tax capping option to remove properties from the capping and clawback system once a property obtains its CVA level of taxation
- opt out/phase out of the capping program
- property tax "notional rate" calculation adjustment
- small-scale on-farm business subclasses to allow for reduced tax rates on up to $50,000 of commercial/industrial assessment

Haldimand County has utilized many of the above tax tools in prior years.

Although there are no specified deadlines for passing by-laws required to enact tax rates, tax ratios, and capping provisions (with the exception that by-laws must be enacted within the calendar year they pertain to), final tax billing cannot commence until such by-laws have been passed. Based on the recommendations in this report, staff anticipate bringing the tax policy related by-laws to the June 24th Council meeting for approval. This will allow the final 2019 tax billings to be prepared and issued to property owners shortly thereafter, with the installments due on August 30th and October 31st.

ANALYSIS:

The actual total property taxes on a specific property in Haldimand County are calculated based on two principal factors: 1) the assessed value; which is then multiplied by 2) the tax rate. The Municipal Property Assessment Corporation (MPAC) determines the assessed value and property class for each individual property based on Province-wide rules and regulations. The only factor Haldimand County has control over is the municipal tax rate and even that is subject to many legislative requirements. This

report presents the tax policy issues that Council needs to consider which will have an ultimate impact on an individual property's tax bill. Next to the annual budget approvals, this is the most important financial policy decision that Council makes that directly impacts all taxpayers in a given year.

As noted above, annual impacts of property taxation on individual property owners are a factor of the following parameters: assessment changes/shifts; education tax rates; municipal tax levy requirements; and tax policy decisions. When Council approved the 2019 Tax Supported Operating Budget, the estimated tax impact on different property classes did not include any impacts related to tax policy changes. At the time the 2019 levy was established, the overall tax impact on the average residential home was projected to be 2.23%. Based on the tax policy recommendations reflected in this report, the revised overall tax impact on an average residential property has decreased to 2.16%. This change is due primarily to assessment adjustments to the returned roll as described below, and lower than estimated education tax rates.

A. Adjustments to the Returned Assessment Roll

Pursuant to the Municipal Act, tax rates are to be applied equally to the assessment for real property made under the Assessment Act according to the last returned roll. Under Section 341 of the Municipal Act, the Treasurer shall adjust the tax roll for the year to reflect changes to the returned assessment roll and taxes shall be collected in accordance with the adjusted roll. These adjustments included amendments due to: assessment appeals through a Request for Reconsideration (RfR) or an Assessment Review Board (ARB) decision; and adjustments by MPAC to reflect assessment or tax class changes after the roll has been returned including: Special Amended Notices (SANs), Post Roll Amended Notices (PRANs) and Tax Incentive Adjustments (TIAs). As the majority of these changes reflect reductions to the roll, typically the returned roll is reduced by these amendments. Each municipality must notify the Province of their "cut-off" date, being the last day for changes to be reflected on the assessment roll for final property tax billing. All subsequent assessment amendments will be reflected as in-year adjustments.

Traditionally, the County has selected a later "cut-off" date to include as many adjustments as possible to limit the annual in-year adjustments that would require sufficient budget to accommodate any net reductions in annual property taxes. The cut-off date for 2019 amendments to the assessment roll was May 6, 2019. The following table summarizes the net adjustments, compared to prior years, reflected on the final tax roll for property tax billing:

Table 1: Summary of Assessment Adjustment Reflected on Final Assessment Roll

Year	2019	2018	2017	2016
Total Taxable Assessment – Original Returned Roll	$6,760,888,280	$6,292,551,322	$5,864,435,477	$5,592,818,638
Assessment Reductions (net)	$1,722,649	$3,172,778	$2,724,125	$15,476,800
Percentage of Taxable Assessment	0.03%	0.05%	0.05%	0.28%

As noted above, the net reduction between the returned and adjusted roll is similar to previous years (with the exception of two properties with significant adjustments in 2016 that created an anomaly). Although the net change is relatively minor, there is a significant shift from the Residential tax class to the Farmland tax class of approximately $7.6 million in assessed value. These changes are a result of MPAC receiving the appropriate documentation to move these properties to the Farmland tax class. As the Farmland tax class is taxed at 25% of the Residential tax class, this represents a loss in County tax

revenues that requires a tax rate increase in all other classes. Based on the revised assessment and proposed tax ratios in each property tax class, the effective assessment reduction is approximately $9.0 million or 0.13% of the original returned assessment. This assessment change alone, in the absence of any further tax policy changes, will increase the overall 2019 tax impact on all tax classes.

As the County has actively made as many changes to the assessment roll as possible each year prior to issuing final tax bills, the approved 2019 Tax Supported Budget for in-year assessment changes is reflective of our historical experience related to these tax adjustments. If these changes are not reflected on the final tax billing, they would have to be reflected as in-year tax reductions to the applicable properties. It is, therefore, recommended to include all assessment changes up to May 6, 2019 as has been the practice in past years.

B. Notional Tax Rate Calculation Adjustment

In response to municipal requests, starting in 2016, the Province has enacted legislation that allows municipalities the option to exclude certain assessment adjustments in the calculation of the "notional tax rates" for final billing purposes. The purpose of the calculation of "notional tax rates" is to segregate annual re-assessment impacts from municipal levy impacts. Although this will not change the overall tax impact on a property class, it will clearly delineate the re-assessment vs municipal levy impacts to ensure that real property assessment growth year over year can be retained by municipalities to offset required municipal levy impacts. This information is required to be reported annually on the final tax bills - the details of the year over year changes are on the back of the County's property tax bill (Schedule 2 for non-business classes and Schedule 3 for business tax classes).

Using the analysis tools in the on-line Ontario Property Tax Analysis (OPTA) software, the overall municipal levy impact (Council controlled), with removal of the re-assessment impact (MPAC controlled), is outlined in the following table, for each property tax class:

Table 2: Notional Tax Rate Calculation Methodology

Property Tax Class	***2019***	***2018***
	Overall Municipal Levy Change %	***Overall Municipal Levy Change %***
Residential	2.30%	1.48%
Multi-Residential	2.47%	1.57%
Commercial	1.57%	0.99%
Landfill	1.53%	0.97%
Industrial	1.73%	1.09%
Pipelines	1.45%	0.91%
Farm	2.30%	1.48%
Managed Forests	2.30%	1.48%

The use of this restated nominal tax rate calculation better illustrates the components that make up the year over year overall tax change and also ensures that annual growth in assessment is maintained by the municipality to offset levy impacts. Accordingly, it is recommended that the revised method of calculating the "notional tax rates" for 2019 be adopted by Council.

C. Tax Ratios

The tax ratios represents the relations of the tax rate for each property class relative to the tax rate for the residential property class. Provincial legislation establishes the residential property tax ratio as 1.0. The only other prescribed ratio is the managed forest property tax class which must be 0.25 (i.e. one quarter of the residential tax rate).

The Province has also established two main concepts related to tax ratios – "Ranges of Fairness" and "Threshold Ranges".

- "Ranges of Fairness" were established as a long-term strategy for moving all property tax rates closer to residential rates (refer to Table 3 below). Multi-residential, commercial and industrial class properties have been traditionally taxed at a higher rate than residential and farm properties. The long-term goal of the Provincial Government that initiated the property taxation reform in 1998, was for municipalities to move toward the Ranges of Fairness for all property classes.
- "Threshold Ranges" were established to be the upper limit for tax ratios (also refer to Table 3 below). If a municipality's tax ratio for any class exceeds the "Threshold Range", any budget levy increase for that year could not be passed on to properties in that particular tax class (this is referred to as a *municipal levy restriction threshold*). To permit annual levy increases to be applied to all property classes, municipalities would have to lower their tax ratios below the Threshold Range. Since 2002, when Council reduced the industrial class tax ratio to 2.3274, which was below the prescribed ratio of 2.63, all property tax classes were within the "Threshold Ranges". However, starting with the 2017 taxation year, the Province changed the threshold range for the multi-residential from 2.63 to a maximum of 2.0. Council approved reducing the County's ratio to 2.0 in 2017 to avoid this restriction.

The setting of tax ratios by the municipality each year has a major effect on the apportionment of property taxes across all property classes. Any change to a tax ratio for one class will impact the tax burden/share of all other classes to varying degrees. As the municipal levy requirements are fixed, each class's piece of the "pie" is based on its proportional share of the overall assessment; which is impacted by the tax ratio of the property class.

As a result, with the exception of the residential and managed forest property tax classes, Council has the authority to amend the remaining property tax classes' ratios, subject to applicable legislative restrictions. The main decisions to be reviewed/decided are as follows:

- **Reduce tax ratios in tax classes that currently exceed the Province's "Range of Fairness":** Municipalities have the ability to reduce the tax ratios in tax classes that exceed the "Range of Fairness" or exceed the "Threshold Ranges"
- **Farm class tax ratio**: Provincial legislation establishes the tax ratio for the farm property class at 0.25 or *such lower ratio as the municipality may establish*.
- **Multi-Residential class tax ratio (existing properties)**: As indicated above, the Province has established the municipal levy restriction threshold at 2.0 for this class. Council approved reducing the County's ratio to 2.0 in 2017 to avoid this restriction, allowing any levy increase to be shared proportionately with this class.
- **"New" multi-Residential class tax ratio**: In 2017, the Province established a "new" multi-residential class that is required to have a mandatory tax ratio between 1.0 and 1.1. This will only affect new multi-residential properties. In 2017 Council approved a ratio of 1.0.
- **Landfill class tax ratio**: In 2017, the Province established a new tax class for landfills and established limitations on the tax ratio for this class. In 2017 Council approved a ratio of 1.6929 similar to other commercial classes.

- **"Revenue neutral" tax ratios**: The Province has established tax policy tools to allow municipalities to mitigate tax shifts as a result of re-assessment. These tools essentially allow municipalities to change tax ratios to mitigate the tax shifts to the residential property tax class due to re-assessment.

As stated previously, any reduction in a tax ratio for one property class will result in a shift of tax burden to other property classes. The following is a detailed analysis of each of the above tax classes including recommended tax ratios for each class.

C1. Reduce Tax Ratios in Property Tax Classes that Exceed the "Range of Fairness" (Commercial and Industrial classes)

Municipalities have the ability to reduce the tax ratios in tax classes that exceed the "Range of Fairness" or exceed the "Threshold Ranges". As noted above, the "Range of Fairness" were the targets established by the Province during property tax reform in 1998 with the long range goal of moving property tax classes closer to the residential tax rate. Although ranges were established for all tax classes, the focus was primarily on multi-residential, commercial and industrial properties that were traditional taxed at a higher rate than the residential tax rate. The "Range of Fairness" for tax ratios for these properties ranges from 0.60 to 1.10. The County's current tax ratios exceed this range but are within the "Threshold Range". An analysis of the multi-residential class is provided below.

A review of the County's current tax ratios for commercial and industrial properties indicates the ratios are slightly above our municipal comparators (based on the most recent BMA Study). To reduce these ratios would shift tax burden to other tax classes – primarily the residential tax class. Although this shift would provide some tax relief for the commercial and industrial tax classes, the relative tax burden for these classes is currently very low and significantly below our municipal comparators, particularly in the commercial tax class. It is also unknown if a reduction in the tax ratio would have any positive impacts on growth in these particular sectors.

Any change in tax ratios requires a comprehensive and thorough review, as any reduction has a corresponding and opposite effect on another tax class. Typically a tax ratio review would be tied to the start of a re-assessment year to evaluate and smooth any impacts over the four year re-assessment phase-in.

Recommendation: Given the fact this is the third year of a re-assessment phase-in and many of the re-assessment impacts have been applied to the affected properties and the inevitable shift to the residential tax class of any reduction; it is recommended that the commercial and industrial tax ratios remain the same as previous years. If Council wants to contemplate any reduction in these or any other tax ratios, it is recommended that staff be directed to do a comprehensive review that aligns with a start of a re-assessment year.

C2. Farm Class Tax Ratio

Provincial legislation permits the municipality to move the ratio for the farm property tax class below the ratio of 0.25 set by the Province. Such action would shift tax burden to the other tax classes, primarily residential.

As outlined in report FIN-03-2019, although farm current value assessments (CVA's) have increased by approximately 11.05% year over year, the fact that this class pays only 25% of the residential tax rate has mitigated some of the actual dollar shift in the overall tax burden. Similar impacts have occurred during reassessment in 2012 (affecting tax years 2013 through 2016) and again during reassessment in 2016 (affecting tax years 2017 through 2020). As this is the third year of phased assessment from

the January 1, 2016 valuation date, assessment shifts will also occur in 2020, until the next MPAC reassessment.

When comparing Haldimand County's assessment base to other municipalities, there is a high reliance on the residential tax class to generate taxation revenue to meet the municipal levy requirements. The residential tax class absorbs approximately 78% of the overall tax burden and has historically experienced annual increases due to reassessment – from a low of 70.6% in 2001 to its current level of 78.0%. Comparatively, the Farmland class tax burden has varied from a low of 2.5% to its current high of 4.6% (over the same period from 2001 to 2019). In addition, certain properties in the residential tax class also increased more than the average year over year change due to inter-class shifts affecting their market value (e.g. water front properties and certain urban centres within the County).

Despite the tax shifts inevitably caused by reassessment, past Councils have never utilized available tax policies options to mitigate changes in tax burden to any of the major tax classes when such shifts have been caused by updated market values. Information was presented to Council in May of 2017 by staff, MPAC and the Ontario Federation of Agriculture representatives to explain the limited options available to the County to mitigate reassessment impacts. As the same levy "pie" needs to be divided amongst the County's property classes, any change in tax policy will result in further shifts among the classes (primarily negatively impacting the residential class) that will have nothing to do with what the property is worth, thus moving away from the fundamental basis of property taxation based on market value. During these presentations and a further review in 2018, it was also noted that very few municipalities have reduced the farm property tax ratio below 0.25.

It should also be noted that the Province has established specific legislation to offset tax shifts due to reassessment. These provisions primarily allow the municipality tax ratio "flexibility" to increase the commercial and industrial tax classes to offset the impact to other property classes – primarily the residential tax class. As such, decreasing the farm property tax ratio would have the opposite effect of the intent of the provision established by the Province to offset tax impacts of reassessment – namely reducing the farm ratio would increase the tax shift to the residential property class as opposed to reducing the tax shift.

Similar to previous years, staff do not recommend any changes to the farm property class current tax ratio of 0.25. However, as outlined later in this report, Council adopted two optional subclasses for farm properties with small-scale on-farm business activities in 2018. This could provide 2019 tax relief to some farm properties from the current taxation at the commercial and industrial tax rates. In 2018, MPAC completed a review of farm properties and did not identified any eligible small-scale on-farm business within Haldimand County at this time.

As noted above, similar to any proposed reductions in commercial or industrial tax ratios, any change in tax ratios requires a comprehensive and thorough review, as any reduction has a corresponding and opposite effect on another tax class.

Recommendation: Based on the above and for the reasons explained in previous presentations, staff are recommending that the farm tax class ratio remain at 0.25 for 2019 but that the optional subclasses for farm properties with small-scale on-farm business activities be utilized in order to provide some tax relief for economic development reasons.

C3. Multi-Residential class tax ratio (existing properties)

The Province has heard concerns about the significantly higher property tax burden for multi-residential apartment buildings and its potential implications on housing affordability in the rental market. In response to these concerns, the Province reviewed property taxation of multi-residential apartment buildings. This review involved extensive consultations with municipalities, as well as other affected stakeholders, including renters and apartment building owners and was completed in early 2017.

The Province has taken steps to ensure that high municipal tax burdens on multi-residential properties do not increase. Starting with the 2017 tax year, municipalities with a multi-residential tax rate that is double the residential rate or higher will be restricted from increasing this burden. This means, where the multi-residential tax ratio is greater than 2.0, a full levy restriction will be implemented and reassessment related shifts onto the multi-residential class will be prevented. The County's multi-residential tax ratio for 2016 was set at 2.33 times the residential rate, meaning that unless it was reduced to the prescribed maximum of 2.0, a full levy restriction would have been in effect for 2017. Given the restrictions and minimal impact in 2017, Council approved a tax ratio of 2.0 for the multi-residential class for 2018.

The reduction of the ratio to 2.0 also brought the ratio for multi-residential buildings closer to the range of fairness noted in table 3 below. Although staff have some concerns whether the associated property tax savings are actually being passed on to the renters, the reduction does meet the Province's intent.

For 2019, Council can reduce the ratio further, but cannot increase the ratio established in 2017. As the County currently has a ratio at the required 2.0 to avoid any tax levy restrictions, there is no pressing need to change it further at this time. It should be noted that all new multi-residential properties have a lower tax ratio which is beneficial in encouraging new affordable housing.

Recommendation: based on the above, staff are recommending that the multi-residential tax class ratio remain at 2.00 for 2019.

C4. "New" multi-Residential class tax ratio

Further to the restrictions for existing multi-residential properties, new multi-residential buildings with a building permit date of April 20, 2017 or after will have a mandatory tax ratio of between 1.0 and 1.1. Currently, the County does not have any new multi-residential buildings that fall within the new tax class. In the event that a new multi-residential building permit is issued after April 20, 2017, the multi-residential (new construction) tax rate is included in the County's 2019 Levy By-law.

Given the rationale for the ratio being at or close to the residential tax ratio is to help stimulate new affordable housing, having a ratio slightly higher would serve limited purposes and derive very little additional taxes. In additional, most Federal or Provincial grant opportunities for affordable housing contain requirements to tax these developments at the same rate as residential properties. This would require these developments to have a tax ratio of 1.0 in any event.

Recommendation: For the above reasons, staff are recommending that the "new" multi-residential tax class ratio remain at 1.00 for 2019.

C5. Landfill class tax ratio

The Landfill property tax class was also new starting in 2017. Under previous legislation, landfills were included within the commercial category. Currently, the County only has one (1) taxable landfill property that qualifies for the new class. The Province has established the "Starting Ratio" as the 2017 ratio for the Commercial tax class. Municipalities have the flexibility to establish the tax ratio within the "Range of Fairness" with the upper limit established at the greater of: (a) Revenue Neutral Ratio for the class, increased by 5%, or (b) 1.1. Given the limited number of properties/assessment in this tax class (this new class generates less than $9,000 annually at the current commercial tax ratio), having a slightly higher tax ratio would have limited impacts.

However, as the "Range of Fairness" has a maximum of 1.8572 to a low of 1.1, increasing this class above the current regular commercial class tax ratio would create additional disparities within the commercial class and leave this class further away from the lower limit of the "Range of Fairness".

Recommendation: Based on the above analysis, staff are recommending that the landfills tax class ratio remain at 1.6929, the same as other occupied commercial properties, for 2019.

C6. "Revenue neutral" tax ratios

The Province has established provisions primarily to allow municipalities the "flexibility" to increase the commercial and industrial tax class ratios to offset the impact of shifts to other property classes – primarily the residential tax class. In addition, the legislation also allows increasing the tax ratio for these classes even if a municipal levy restriction is in place due to the current tax ratios being above the "Threshold Range". This provision allows the ratios to be adjusted to offset up to 50% of any increase applied to the residential property class. These two provisions are often referred to as establishing "Revenue Neutral" tax ratios.

These provisions have been in place since regular re-assessments have been established (starting in 2009) yet County staff have never recommended these provisions. Although, increasing the commercial and industrial class tax ratios would help offset the tax burden shift to the other classes, it would move the tax ratios further away from the "Range of Fairness" (currently 0.6 to 1.1). Additionally, the current ratios for these classes, 1.6929 for the commercial class and 2.3274 for the industrial class are very close to the thresholds for municipal levy restrictions. Increasing these ratios would add additional tax burden to these properties and may impact their competiveness with surrounding municipalities that are moving closer to the "Range of Fairness".

Similar to the farm class tax ratio discussion, the use of these provisions would artificially adjust the tax burden and not reflect the intended tax burden allocation resulting from market value assessment.

Recommendation: For the above reasons, staff are recommending that the provisions to implement "revenue neutral" commercial or industrial class tax ratios not be utilized in 2019.

Based on the above noted recommendations, Table 3 compares Haldimand County's proposed 2019 to the 2018 ratios and the provincially legislated ranges.

Table 3 – 2019 Recommended Tax Class Ratios

Property Class	Range of Fairness	Threshold Ranges	2019 Recommended Tax Ratios	2018 Final Tax Ratios
Multi-residential	1.0 to 1.1	2.00	**2.0000**	2.0000
Multi-residential (New)	1.0 to 1.1	1.10	**1.0000**	1.0000
Commercial	0.6 to 1.1	1.98	**1.6929**	1.6929
Industrial	0.6 to 1.1	2.63	**2.3274**	2.3274
Landfill	0.6 to 1.1	1.86	**1.6929**	1.6929
Pipeline	0.6 to 0.7	n/a	**1.4894**	1.4894
Farm	n/a	n/a	**0.2500**	0.2500

It is important to note that moving the current tax ratios closer to the Ranges of Fairness will shift tax burden among property classes, primarily onto the residential class. Section 308 of the Municipal Act provides that municipalities can move current tax ratios closer to the Ranges of Fairness, but may not move them further away.

As reported in FIN-03-2019 Analysis of Assessment Update for 2019, Table 4 provides a revised comparison of the municipal tax burden by property class for 2019, with the comparative burden for 2018 (based on the above noted recommended tax ratios). It should be noted that this reflects property tax burden only and excludes the taxation revenue generated through payments-in-lieu of taxes (i.e. from OPG as well as other government properties).

Table 4 – Tax Burden by Property Class

Property Tax Class	2019 Proposed Final Based on Tax Policy	2019 Based on Returned Roll	2018 Final
Residential	**78.04%**	78.09%	77.78%
Farm/Managed Forest	**4.62%**	4.59%	4.47%
Multi-residential (*)	**1.35%**	1.34%	1.41%
Commercial/Landfill (*)	**8.11%**	8.11%	8.14%
Industrial	**6.21%**	6.20%	6.47%
Pipelines	**1.67%**	1.67%	1.73%

** Multi-residential (New Construction) & Landfill property classes were new starting 2017 as a result of new Provincial legislation – there is currently one property in the landfill class and no properties in the multi-residential (new construction) class*

D. Tax Reductions

The Municipal Act provides specific legislation with respect to tax reductions for different sub-classes of property. There are different provisions for: (i) vacant and excess land in the commercial/industrial property tax classes; (ii) all sub-classes related to farmland awaiting development and (ii) optional subclasses for both industrial and commercial small-scale on-farm business activities.

D1. Vacant and Excess Land Subclasses

Prior to 2017, tax rate reductions for vacant and excess land within the commercial and industrial classes were set by legislation at 30% and 35% respectively. Starting in 2017, the Province provided municipalities with the ability to amend the reduction program to align with local circumstances and needs. Municipalities were given the flexibility to reduce the reduction percentages or eliminate the program entirely. Through reports CS-FI-08-2017 and CS-FI-15-2017, these options were evaluated in conjunction with public consultation and, ultimately, Council approved a phase out of the program starting in 2017. The phase-out will continue over the next three years by reducing the current reduction evenly until it is completely eliminated in 2021. The phase-out will also eliminate the annual expenditure incurred by the County to fund the program.

D2. Farmland Awaiting Development

Tax rate reductions related to farmland awaiting development (FAD) are divided into two sub-classes and can be established within a range established under Provincial regulation (O. Reg. 298/03 of the Municipal Act). The reductions are set relative to the residential tax class for all non-residential tax classes.

The maximum reduction allowed for “first class” farmland awaiting development is 75%, which is consistent with the regular farmland tax class; the minimum is 25% (i.e. the property would pay 75% of the full tax rate in the applicable class). The County started with the maximum allowable reduction and has been phasing it down to the minimum reduction of 25%. As there are a limited number of properties in the FAD class (i.e. 6 properties in total across the County), changing the reduction percentage will not have a major tax impact but it will provide additional taxation revenue while these properties are

awaiting development (which can be several years). As a result, it was previously recommended that the reduction percentage be gradually moved towards the minimum reduction percentage allowable under the regulation (i.e. 25%).

Under the current regulation, the maximum this percentage can be adjusted in any given year is 10%. No change is required for 2019 as, in 2016, the discount was at the minimum of 25%. It is, therefore, recommended that the reduction for residential farmland awaiting development remain at 25% for 2019, representing the legislative minimum reduction. The corresponding reduction for the non-residential tax classes is a prescribed calculation to provide for the same level of taxation as the residential farmland awaiting development tax class. This calculation provides for a 67.78% reduction for industrial, 62.5% reduction for multi-residential and a 55.70% reduction for the commercial tax classes, respectively.

As there is no minimum for “second class” farmland awaiting development, it is recommended that the reduction be maintained at 0% similar to previous years.

D3. Small-scale On-farm Business

In May 2018, the Minister of Finance announced new optional small-scale on-farm business subclasses for qualifying assessment in the industrial and commercial tax classes. To be eligible, the commercial and/or industrial facility must be used to sell, process or manufacture something from a farm product produced on the farmland or on land used to operate the farming business. These optional subclasses will provide some moderate tax relief (the eligible assessment will be taxed at 25% of the commercial or industrial tax rate) while providing additional economic development opportunities across the County.

It should be noted that the Province did enact a reduced Education rate for these small scale on-farm businesses regardless of whether a municipality has opted to have the subclasses apply or not. MPAC had indicated that the assessment related to these subclasses would likely not be identified until late 2018, however at this time there are not any properties in Haldimand County that have been assessed in these subclasses. As such, the overall financial impact is not known at this time. However, as the maximum assessment eligible for each property is limited to $50,000 combined for both subclasses, staff do not feel it will have a material impact on approved budgets (maximum reduction for each qualifying property is less than $1,000 annually). Once the assessments have been identified, any shortfalls in current budgets will form part of the overall surplus/deficit for 2019 and future budgets can be amended if necessary to address the impacts of the optional subclasses. Council adopted both of the eligible subclasses in 2018 to support local farmers and to help diversify their operations and grow our local economy.

E. Tax Capping Options and Parameters

The intention of the property taxation system is to establish taxes based on a property’s market value or current value assessment (CVA). In order to mitigate large tax increases or decreases for commercial, industrial and multi-residential properties, the Province introduced the capping program many years ago to limit the tax increases on non-residential properties. To provide funding for these tax reductions without putting the burden on the residential taxpayers, the Province enacted legislation in 1998 that limited the tax reductions on non-residential properties – referred to as being “clawed back”. The cost of the cap may be funded by: reducing (clawing back) other tax decreases to properties within the same tax class; non-tax revenues such as draws from reserves; a general tax rate increase for all classes; or a municipal tax reduction program.

Although the Province has made several amendments to the “capping” legislation to accelerate the elimination of this program, despite these revisions the Province estimates that approximately 13% of all properties remained in the capping program at the end of 2014. Accordingly, in 2015, the Ministry of Finance initiated a review of the business capping legislation and, as part of that review, established public consultations on potential revisions to the current regime. The Ministry selected individuals to participate in a municipal reference group (Haldimand County was selected as part of the municipal

reference group) as well as a separate business reference group. Through this review and consultation, it was evident that an end to be business tax capping was in the best interest of all parties. As business tax capping was introduced in 1998 as a temporary measure, it was agreed that it was likely beyond its useful or intended purposes. With the ultimate goal of eliminating business tax capping, the following changes were enacted starting with the 2016 taxation year:

- "Enhanced provisions" based on previous limits:
  - Increased annual assessment related (i.e. CVA) increase from 5% to 10%;
  - Increased threshold from $250 to $500;
- Option to exit out of the capping provisions under certain provisions;
- Option to phase a tax class out of capping over a 4 year period.

Additional changes were also enacted for 2017 as follows:

- Eliminating the vacant and excess lands from the calculation to determine if the municipality can "opt" out or phase out the capping for the respective class;
- Option to limit capping to levy increases only and exclude impacts of re-assessment from the capping provisions.

As the County's objectives have been and continue to be the elimination of business tax capping, with the main goal being to move all properties to full CVA taxation as soon as possible, staff are recommending using all available options to achieve this as soon as possible. The capping program is very difficult to administer and very confusing for the taxpayer to understand. Non-residential property owners that should be receiving reduced taxes, as the result of their decreased CVA, have seen those reductions clawed back to provide tax relief for other non-residential properties that experienced large tax increases caused by CVA.

The resulting impacts of adopting the above-noted parameters for the capping program are as follows:

- Annualized assessment related tax increases for non-residential properties will be limited to a maximum of 10%. As a result, for non-residential properties that would have been subject to more than a 10% increase based on their CVA taxation, these properties will be capped and have a corresponding reduction to limit their increase to 10%.
- For any property for which the 2019 CVA tax increase is within a maximum of $500 of the 2018 amount of taxes, the true CVA taxation will be charged and there will be no reduction or clawback.
- Properties previously at full CVA tax and/or properties that go from a capped position to a clawback position and/or properties that go from a clawback position to a capped position will be excluded.
- Based on the criteria, there will be an exit from the business tax capping program for all eligible tax classes.
- For tax classes not eligible to exit from the business tax capping, staff will implement the phase-out where the eligibility conditions are met.

Table 5 illustrates the impact of the proposed capping options outlined above:

Table 5 – Impact of Proposed Capping Options

Description	Proposed 2019 Capping Options		
	Multi-residential	**Commercial**	**Industrial**
Capping and Threshold Parameters			
• Annualized Tax Limit	10.00%	10.00 %	10.00 %
• Prior Year CVA Tax Limit	10.00%	10.00 %	10.00 %
• CVA Threshold - Increasers	$500	$500	$500
• CVA Threshold - Decreasers	$500	$500	$500
• Exclude properties at CVA	Yes	Yes	Yes
Property Count by Category (#)			
• Protected by Annualized Capping	0	3	1
• Clawed Back/Above CVA Taxes	0	2	1
• At CVA Tax	40	941	342
• **TOTAL PROPERTIES**	**40**	**946**	**344**
Tax Adjustments			
• Reductions	$0	$(9,864)	$(9,465)
• Clawbacks	$0	$9,864	$9,465
• **NET CLASS IMPACT**	**$0**	**$0**	**$0**
Eligible to Exit Capping Immediately	**Yes**	**No**	**No**
Eligible to Phase-out of Capping	**n/a**	**No**	**No**

As shown in the above table, approximately 99.5% (1,323 out of 1,330) non-residential properties will be taxed at their full CVA using the recommended capping parameters. The use of these optional tax provisions have moved a significant number of properties to full CVA taxes from the capped/clawed back position over the past five years.

All properties in the Multi-residential tax class are at their CVA taxes, this class exited from the capping program starting in 2016. Both the commercial and industrial tax classes are not eligible for immediate exit or phase-out of tax capping at this time. To be eligible for the phase-out, all capped properties must be within 50% of their CVA taxes. Unfortunately, we have 1 property in the industrial tax class that is currently at 43% of its CVA taxes. In the commercial tax class, there is currently 1 property at 49% of their CVA taxes. Once these properties are within 50% of their CVA taxes, the County can initiate the 4 year phase-out.

The Province estimates that all properties, assuming these new provisions are utilized, will be at their CVA taxes within nine years at the latest.

If Council adopts staff's recommendation to implement the proposed options, the preliminary information in the Ontario Property Tax Analysis (OPTA) system calculates that there are sufficient tax decreases for properties within the industrial and commercial classes to fund the caps on those properties that are experiencing tax increases. If the proposed options are not utilized, there is a risk that there would not be sufficient tax decreases to fund the caps on the properties that are experiencing tax increases. Legislation requires that any shortfall in tax caps must be funded by non-tax revenues such as draws from reserves or by a general tax rate increase for all classes.

It must be reiterated that certain commercial and industrial properties, which should have experienced decreased taxes due to assessment changes, are having some of their 2019 CVA related tax decrease "clawed back" so that other similarly classed properties will not realize significant tax increases. In the industrial class, one property has been clawed back to fund one property's capping protection. In the commercial class, two properties have been clawed back to fund three properties capping protection. Again, these tax increases and decreases are all related to changes in the property's value (assessment) and not the result of any Council approval of municipal levy changes.

F. Tax Capping for "New Construction/New to Class"

Provisions under Section 329.1 of the Municipal Act provide municipalities with the ability to phase out the tax capping provisions for eligible properties as defined under Section 331(20). These eligible properties are defined as multi-residential, commercial or industrial properties that meet one of the following conditions:

- As a result of additional assessment, the assessment of the property is increased by an amount equal to or greater than 50%; or
- The property was new to the multi-residential, commercial or industrial property class during the year.

These properties are typically referred to as "new construction" or "new to the class" properties. Section 331 of the Municipal Act provides for tax capping based on comparable properties in the vicinity. As a result, these properties are removed from the normal capping calculations for properties in these classes and capping protection is provided at the same level as six comparable properties. In future years, these properties are then capped with other properties currently in the same property class. This process is very cumbersome to administer and results in additional properties not being taxed at their respective CVA taxation level.

To improve the process, the Province introduced provisions under Section 329.1 of the Act whereby municipalities had the option to phase out the capping parameters for these properties resulting in all "new construction/new to class" properties taxed at their CVA taxation level. Most municipalities across the Province utilized these provisions to eliminate the current ineffective capping program for these properties. In 2008, the County passed a by-law to adopt these provisions, thereby eliminating the capping of these properties. Once this by-law has been established, there is no requirement to pass similar by-laws in future years and, as a result, these provisions continue to be in place for 2019.

G. Vacant Unit Tax Rebates

Starting in 2017, the Province provided municipalities the ability to amend the vacant unit tax rebate program to align with local circumstances and needs (similar to the flexibility allowed for the tax reduction program for commercial and industrial subclasses). Municipalities were given the flexibility to reduce the tax rebate percentages or eliminate the program entirely. Through reports CS-FI-08-2017 and CS-FI-15-2017, these options were evaluated in conjunction with public consultation and ultimately Council approved a phase out of the program starting in 2017. For the industrial tax class, the vacant unit tax rebate program ended at the end of 2017 so there is no tax relief for industrial properties that are vacant in 2019. For the commercial class, the tax rebate was to be phased out over two years, with a reduction in the rebate percentage from 15% to 0% in 2019, meaning the program is no longer available starting in 2019. As a result, the vacant unit tax rebate percentages will be adjusted to reflect this direction for 2019.

H. Existing Policies

The following additional Tax Policies are presently in place and do not require amendment at this time. (They are available for public review on the County website.)

1. Tax Rebates to Charitable or Similar Organizations.
2. Municipal Tax Deferral for Low Income Seniors or Low Income Disabled Property Owners.

The above noted policies are mandatory under current legislation and procedures are reviewed on an "as required" basis (i.e. changes in the underlying legislation, recent court decisions/interpretations, etc.) to ensure the desired intent of these provisions is still being met. At this time, the remaining policies are currently meeting legislative and administrative needs and will be subject to change in the future as required.

Exemption for Royal Canadian Legions

In November 2018 the Province introduced Bill 57, the *Restoring Trust, Transparency, and Accountability Act, 2018* amended the *Assessment Act* to include a new section 3(1)15.1 exempting land occupied by an Ontario Branch of the Royal Canadian Legion that is used as a memorial home, clubhouse or athletic grounds. Effective January 1, 2019, the exemption is from both municipal and education taxes. Given the timing of this change, the exemptions were not reflected in the returned roll for 2019 taxation, and as such, MPAC will be producing SANs (Special Amended Notices) which are expected by the end of June. The 2019 Tax Supported Operating Budget reflected a reduction to remove the rebate expense related to Legions, but it should be noted that there will still be an expense to accommodate this adjustment, which will be accommodated within the tax adjustments budget for 2019. The exemption will be reflected on the returned roll for 2020 taxation. This change will require a review and update to the Tax Rebates to Charitable or Similar Organizations Policy at a later date.

I. 2019 Tax Rate Impact on Property Classes

As indicated above, the four main factors that impact the annual taxes on an individual property are: annual assessment impacts; Education tax rates, municipal levy requirement and tax policy decisions. During the review and approval of the 2019 Tax Supported Operating Budget, the impacts of re-assessment, changes in estimated Education rates and the levy requirements for 2019 were factored into the estimated tax impacts on the average assessed properties in the major tax classes which were presented to Council at that time.

Subsequent to the budget approval, as in most previous years, the Province revised the education tax rates based on the impacts of re-assessment. The estimated tax rates utilized during the 2019 Operating Budget presentation are slightly different than the final approved 2019 Education tax rates. As a result, the calculated tax impacts during the approval of the Tax Supported Operating Budget are also slightly different, with primarily a decreased tax impact for all classes.

Assessment roll changes subsequent to the 2019 Budget review, and tax policy decisions outlined in this report have subsequently impacted the overall tax impact on various property classes. In comparing 2019's total average property tax increase to 2018's, the associated impacts for specific tax classes are as outlined in the table below.

Table 6 – Average Tax Impacts on Selected Property Tax Classes

Assessment	2018 Final per CS-FI-13-2018				2019 Proposed Final				Increase		Monthly
Class	Ave CVA	Municipal	Education	Total	Ave CVA	Municipal	Education	Total	$	%	$
Industrial	522,387	12,975.38	6,999.98	19,975.36	529,805	12,989.75	6,834.48	19,824.23	(151.13)	-0.76%	(12.59)
Multi-Res.	1,032,175	22,031.31	1,754.70	23,786.00	1,048,071	22,081.81	1,687.39	23,769.20	(16.80)	-0.07%	(1.40)
Commercial	295,282	5,334.89	3,702.43	9,037.32	307,271	5,479.82	3,706.26	9,186.09	148.76	1.65%	12.40
Residential	256,400	2,736.37	435.88	3,172.25	266,860	2,811.24	429.64	3,240.88	68.63	2.16%	5.72
Farmland	334,600	892.74	142.21	1,034.94	371,600	978.66	149.57	1,128.22	93.28	9.01%	7.77

As previously noted, the major reason for differences in the overall tax impact presented at budget time versus now is due to the individual property's whose assessments have changed between when the tax roll was returned in late 2018 till the changes were cut off in May 2019, and lower than anticipated education rates. Due to these changes, all property classes saw a decrease (except multi-residential with an increase of 0.02%) ranging from 0.07% for the residential and farmland class to 1.01% for the industrial tax class. It is important to note some key points from the above table:

- The overall tax impact on each individual tax class varies considerably, due primarily to the assessment shifts of 2019 (as noted in report FIN-03-2019 Analysis of Assessment Update);
- The education portion of the overall tax class varies considerably, depending on the property class, from approximately 34.4% of the industrial tax bill to only 7.1% for a multi-residential property.

Based on the Tax Policy recommendations outlined in this report, together with the 2019 approved municipal levy, education taxes and assessment shifts, the average residential property will see an overall increase of 2.16% or $5.72 per month on their 2019 total tax bill.

The following chart compares the proposed tax rates for 2019, based on the recommended tax policies outlined in this report, to the approved 2018 tax rates. Due to re-assessment, the actual tax rate in all classes will be less than the prior year, in order to account for the higher assessed values.

Table 7 – 2019 Proposed Tax Rate vs Approved 2018 Tax Rates by Selected Property Tax Classes

Property Class	2019 Total Tax Rate %	2018 Total Tax Rate %	Year over Year Change Increase/(Decrease)	% Change Increase/(Decrease)
Residential	1.214450	1.237227	(0.022777)	(1.84%)
Farmland	0.303613	0.309307	(0.005694)	(1.84%)
Commercial	2.989574	3.060570	(0.070996)	(2.32%)
Industrial	3.741800	3.823864	(0.082064)	(2.15%)
Multi-residential	2.267900	2.304454	(0.036554)	(1.59%)

Attachment #1 to this report represents the Draft Tax Levy Summary that will be included with the Levy By-law to be presented at the Council Meeting on June 24, 2019. Final tax bills for Haldimand County property owners will be issued in July, with installment payments due on August 30th and October 31st.

J. Railway Right-of-Way Property Taxation Rates for 2019

The 2016 Ontario Economic Outlook and Fiscal Review announced that the Province had initiated a review of the property taxation of railway rights-of-way in response to municipal requests. As part of the review, the Province has held consultations with municipalities and representatives of the railway industry. Based on these consultations, in the 2017 Ontario Budget, the Province announced that it was taking action to address three key issues related to: indexation of rates, variation in rates, and implications for short-line railways. Municipalities have expressed concerns that property tax rates on railway rights-of-way have not been updated since the late 1990s.

Beginning in 2017, property tax rates on railway rights-of-way were updated to reflect the average annual percentage change in taxes on commercial properties. This means that municipal property tax rates for mainlines increased by approximately $18 per acre for 2018. There was expectation that the rates for mainlines would again increase for 2019, however, the Province has provided confirmation that property tax rates for 2019 will be the same as 2018.The Province froze the shortline railway

property tax rates at 2016 levels again for 2019 in recognition of the challenges faced by this sector of the railway industry. It is hoped that, in future years, the Province will continue to adjust rates to address the key issues identified by municipalities. The below table summarizes the 2018 and 2019 rates.

Table 8 – 2019 Railway Right-of-Way Property Taxation Rates per Acre

	Municipal Mainline	Municipal Short-line	Education
2019 Rate/acre	$110.00	$85.58	$114.98
2018 Rate/acre	$110.00	$85.58	$114.98
Change/acre	$0.00	$0.00	$0.00

There are approximately 126 acres of mainline railway right-of-way located within the County. Since there is no change in the rates over the prior year, no additional revenues will be realized. Any changes in the railway per acre taxation rates do not require any action from Council.

K. Other Legislative Changes

The Province enacted a significant number of legislative changes for implementation in 2017, with some becoming effective in 2018. Many of these legislative changes were enacted to promote a stronger Ontario and provide incentives to develop additional affordable housing. Although many of these changes were available for use in 2018, there were two that still required proclamation by the Lieutenant Governor or additional regulations from the Minister before considering utilization at the time of the 2018 Annual Tax Policy Report. These pending changes, which are now effective, include:

- Vacant Home Tax: New provisions under the Municipal Act will allow municipalities to impose a tax on vacant residential homes. The intent of these measures is to discourage speculative ownership of homes.
- Transient Accommodation Tax: New provisions under the Municipal Act will allow municipalities to impose a tax in respect of the purchase of transient accommodation within the municipality. The intent of these measures is to promote occupation of available units in hotels and other short-term accommodation.

Very few municipalities have implemented these provisions at this point. Staff will continue to monitor the implementation and effectiveness of these provisions and make recommendation to Council on the applicability to the County in the future.

FINANCIAL/LEGAL IMPLICATIONS:

In order to meet the reporting requirements as per Provincial legislation, Council must establish the 2019 property tax policies. The final tax rates are determined based on the recommended tax ratios and last revised assessment roll (as at May 2019). Although these tax policy decisions impact the relative burden by individual property classes, the municipal tax levy to be collected in 2019 was approved earlier this year by Council at $67,225,340 and remains unchanged.

It is expected that there are sufficient tax decreases for properties within the commercial and industrial classes to fund the cost of the tax cap within these property classes. There are no tax decreases to fund for multi-residential properties as there are no longer any properties in this class that are capped. Legislation requires that shortfalls (if any) must be funded by non-tax revenues such as draws from reserves or by a general tax rate increase for all classes. Any shortfall will be charged as an expense against the 2019 Operating Budget.

STAKEHOLDER IMPACTS:

The 2019 Tax Policy is in conformity with the concept of balanced growth and economic development in our community.

REPORT IMPACTS:

Agreement: No

By-law: Yes

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Draft 2019 Tax Levy By-Law – Schedule A

SCHEDULE A OF BY-LAW #

THE CORPORATION OF HALDIMAND COUNTY

Draft 2019 Levy By-Law

Property Class	Tax Classes	Haldimand County Tax Rates	Education Tax Rates	Total Tax Rates	CVA	Haldimand County Levy	Education Levy	Total Levy
Residential/Farm	RT (RF,RG,RH,RP)	0.01053450	0.00161000	0.01214450	4,979,587,712	52,457,473	8,017,136	60,474,610
Residential Farmland Awaiting Development	R1P	0.00790088	0.00120750	0.00910838	409,375	3,234	494	3,729
Multi-Residential	MT	0.02106900	0.00161000	0.02267900	42,942,538	904,756	69,137	973,894
Multi-Residential (New Construction)	NT	0.01053450	0.00161000	0.01214450	0	0	0	0
Commercial (Occupied)	CT, ST, GT (CF, CG, CH, CP, DP,GF)	0.01783386	0.01206188	0.02989574	253,513,603	4,521,125	3,057,851	7,578,976
Landfill	HT (HF)	0.01783386	0.01290000	0.03073386	469,800	8,378	6,060	14,439
Commercial Excess Lands/Vacant Lands	CU, SU, CX (CJ, CR, CZ)	0.01515878	0.01025260	0.02541138	21,909,065	332,115	224,625	556,740
Commercial (New Construction)	XT (XP)	0.01783386	0.01030000	0.02813386	32,655,518	582,374	336,352	918,726
Commercial (New Construction) Vacant Lands	XU	0.01515878	0.00875500	0.02391378	497,555	7,542	4,356	11,898
Commercial Small-Scale On-Farm Subclass	CSC	0.00445846	0.00257500	0.00703346	0	0	0	0
Industrial (Occupied)	IT, LT (IH, IP, LH, LI, LN, LS)	0.02451800	0.01290000	0.03741800	113,147,034	2,774,139	1,459,597	4,233,736
Industrial Excess Lands/Vacant Lands	IU, LU, IX (IK, IZ, LK)	0.02022735	0.01064250	0.03086985	19,715,761	398,798	209,825	608,623
Industrial Farmland Pending Development	I1N	0.00790088	0.00120750	0.00910838	1,255,250	9,918	1,516	11,433
Industrial (New Construction)	JT (JP)	0.02451800	0.01030000	0.03481800	40,477,424	992,425	416,917	1,409,343
Industrial Small-Scale On-Farm Subclass	ISC	0.00612950	0.00257500	0.00870450	0	0	0	0
Pipelines	PT	0.01569009	0.01290000	0.02859009	71,552,476	1,122,665	923,027	2,045,691
Farmlands	FT (FP)	0.00263363	0.00040250	0.00303613	1,175,479,866	3,095,774	473,131	3,568,904
Managed Forests	TT	0.00263363	0.00040250	0.00303613	5,552,654	14,624	2,235	16,859
TOTAL TAXABLE ASSESSMENT					**$6,759,165,631**	**$67,225,340**	**$15,202,259**	**$82,427,599**

** - CVA related to Exempt, Payments in Lieu of Taxes (PILs) and Taxable PILs are not included in this schedule*

HALDIMAND COUNTY

Report FIN-13-2019 Applications for Assessment and Tax Adjustments as of May 2019

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To receive approval from Council of applications for tax adjustments, as of May 2019, under Sections 357, 358 and 359 of the Municipal Act.

RECOMMENDATIONS:

1. THAT Report FIN-13-2019 Applications for Assessment and Tax Adjustments, as of May 2019, be received;
2. AND THAT adjustments of taxes, in accordance with Sections 357, 358 and 359 of the Municipal Act, be approved in the amount of $57,321.28 as detailed in Attachment 1 to Report FIN-13-2019.

Prepared by: Mattea Marcoux, Tax Collector

Reviewed by: Charmaine Corlis, Treasurer

Respectfully submitted: Mark Merritt, CPA, CA, General Manager of Financial & Data Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The Assessment and Tax Adjustments summarized in this report relate to Sections 357, 358 and 359 applications processed and returned from the Municipal Property Assessment Corporation (MPAC) up until the date of this report. Based on the information provided by MPAC, it is recommended that total tax reductions of $57,321.28 be approved. Of the proposed reductions, the Municipal share is $37,857.93 and the Education share, to be recovered from the appropriate School Board, is $19,463.35. There are no applications where no changes/reductions are recommended.

BACKGROUND:

Sections 357, 358 and 359 of the Municipal Act, 2001 (the “Act”) allow for applications to adjust taxes levied for various reasons specific to each section. Haldimand County staff receive applications for assessment adjustments throughout the year. Once received, applications are sent to the Municipal Property Assessment Corporation (MPAC) for review and recommended assessment changes (if any), are then sent back to Haldimand County staff to calculate the applicable tax adjustments.

MPAC's role in processing tax adjustment applications is to provide the municipality with the information it needs to enable Council to determine whether a tax refund, cancellation, reduction or increase is warranted. As outlined in the Act, the jurisdiction to make decisions on applications for tax refunds or tax increases rests solely with a municipal council.

Additional information and examples for these three sections can be found under the Property Types menu of MPAC's website (www.mpac.ca) in the property assessment procedures section. A brief outline of each section is as follows.

Section 357

Section 357 of the Act provides that property owners may apply for a reduction in assessment resulting in the cancellation, reduction and refund of taxes due to the following reasons:

- change in class;
- the land became vacant land during the year or during the preceding year;
- the land became exempt from taxation;
- a building on the land was razed by fire, demolition or otherwise;
- a building was damaged by fire, demolition or otherwise so as to render it substantially unusable for the purposes for which it was used prior to the damage;
- a mobile unit on the land was removed during the year or during the preceding year;
- the applicant is unable to pay taxes because of sickness or extreme poverty;
- a person was overcharged due to a gross or manifest error that is clerical or factual in nature; or
- repairs or renovations to the land prevented the normal use of the land for a period of at least three months during the year.

For a 357 application, it must be filed with the Treasurer on or before February 28th of the year following the taxation year in respect of which the application is made. For an example, if a house was demolished in November 2018, the application to adjust taxes must be filed before February 28, 2019.

Section 358

Section 358 of the Act provides that applicants may apply for a reduction in assessment as a result of a gross or manifest error, in the preparation of the assessment roll, that is clerical or factual in nature, including the transposition of figures, a typographical error or similar errors, but not an error in judgment in assessing the property. In general, this Section relates to an error made by MPAC.

A 358 application must be filed with the Treasurer between March 1st and December 31st. The application may apply only to taxes levied for one or both of the two years preceding the year in which the application is made.

Section 359

Section 359 of the Act provides that the Treasurer may make application if an undercharge is caused by a gross or manifest error that is factual, but not an error in judgment in assessing the land. An application under this section must be made on or before December 31st of the year following the year for which the application is made.

For all applications, Council is required to hold a meeting and notify the applicants of its decision by September of the year following the year with respect to which the application is made. Despite these provisions, these applications are brought forward to Council as soon as all information is available at scheduled intervals during the year (3 times a year – spring, summer and fall).

ANALYSIS:

Attachment 1 to this report provides the details of the proposed Section 357 and 358 tax adjustments that were received over the period of January 2019 to April 2019. The recommendations included in this report cover all applications processed and returned from MPAC to date. Any additional

applications awaiting a response from MPAC will be included in the next reduction report scheduled for October 2019.

In accordance with the requirements under the Act, the applicable property owners have been notified of the recommended changes (if any) contained in this report and the date that Council intends to review the applications. The applicants, according to the Act, should have the opportunity to speak to their specific application, at the June 18, 2019, Council In Committee meeting, if they so choose.

Within 14 days after Council's decision, staff shall notify the applicants and specify the last day for appealing the decision. For Section 357 applications, if the property owner does not agree with the adjustment (if any) as approved by Council, they have the ability to appeal to the Assessment Review Board within 35 days of Council's decision. There is **no** appeal process for Section 358 applications (the Act states an application shall not be heard by Council unless MPAC confirms an error in the assessment referred to in the application).

Applications with Recommended Reductions:

The total amount of the proposed tax reductions, affecting these years, are summarized as follows:

Municipal Purposes	$ 37,857.93
Education	$ 19,463.35
Total Proposed Reductions	$ 57,321.28

Applications with No Recommended Reductions:

There are no applications that MPAC has recommended for no assessment change.

FINANCIAL/LEGAL IMPLICATIONS:

Although the tax reductions noted in this report pertain to the taxation years 2017 and 2018, the County's books have been closed for 2017 meaning that the adjustment will be reflected as an expense in 2018. The approved 2018 Tax Supported Operating Budget included an amount of $36,500 for the County's share of tax reductions. The County's share of tax reductions, as outlined in this report totals $37,858. This brings the cumulative municipal share of the total tax reductions approved to date for 2018 to $72,706. This variance will form part of the County's overall Tax Supported Operating variance for 2018.

The education portion of the proposed tax reductions, totaling $19,463, will be recovered from the applicable school boards.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No
By-law: No
Budget Amendment: No
Policy: No

ATTACHMENTS:

1. Proposed Tax Reductions under Section 357/358 and 359 of the Municipal Act

Applications with Recommended Adjustments:

Roll #	Reason for Reduction	Section	Year Affected	Municipal Tax $	Education Tax $	Total Tax $
155.003.06100	Demo/Razed by Fire	357	2017	$ 603.62	$ 98.83	$ 702.45
155.003.06100	Demo/Razed by Fire	357	2018	$ 1,768.18	$ 281.66	$ 2,049.84
152.005.09700	Demo/Razed by Fire	357	2018	$ 1,405.92	$ 975.71	$ 2,381.63
152.005.09700	Demo/Razed by Fire	357	2018	$ 39,105.91	$ 21,096.94	$ 60,202.85
152.005.09700	Demo/Razed by Fire	357	2018	$ 90.42	$ 14.40	$ 104.82
152.005.09700	Demo/Razed by Fire	357	2018	$ (5,758.27)	$ (3,106.48)	$ (8,864.75)
332.008.35200	Demo/Razed by Fire	357	2018	$ 0.23	$ 0.04	$ 0.27
332.008.35200	Demo/Razed by Fire	357	2018	$ 125.50	$ 19.99	$ 145.49
158.002.03800	Demo/Razed by Fire	357	2018	$ 516.42	$ 82.26	$ 598.68
Total Proposed Reductions				**$ 37,857.94**	**$ 19,463.35**	**$ 57,321.28**

Applications with No Recommended Adjustments:

There are no applications that MPAC has recommended for no assessment change.

HALDIMAND COUNTY

Report CLS-07-2019 Provincial Offence Act Write-Offs

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To seek approval to proceed with the write-off of uncollectible Provincial Offences fines in arrears from the period of 1995 - 2008 in accordance with Provincial Offences Act Fine Collection & Write-Off Policy No. 2018-04.

RECOMMENDATIONS:

1. THAT Report CLS-07-2019 Provincial Offence Act Write-Offs be received;
2. AND THAT staff be directed to write-off 1,152 Provincial Offences Act fines deemed uncollectable from the period of 1995 - 2008, totalling $238,561.73, as listed in Attachment 2 to Report CLS-07-2019.

Prepared by: Jennifer Shaw, Deputy Clerk / POA Supervisor

Reviewed by: Evelyn Eichenbaum, Manager, Citizen & Legislative Services / Clerk

Respectfully submitted: Cathy Case, General Manager of Corporate & Social Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The continued annual write-off of uncollectible Provincial Offences Act fines will result in a more realistic reflection of the amount of arrears owing to Haldimand County while permitting both internal and external collection efforts to focus on fines where there is a greater likelihood of successful collection. Staff continue to review arrears to assess the feasibility of collecting on older fines through multiple collection methods and will utilize any applicable collection method, where appropriate. Despite staff's efforts and the full utilization of all tools available, there are fines that the County has been consistently unable to collect and it is deemed necessary to write-off what is not collectible.

BACKGROUND:

In March of 2001, Haldimand County assumed the responsibility for the administration of the Provincial Offences Act (POA) Court through a Memorandum of Understanding (MOU) with the Province of Ontario. At the time of transfer in 2001, over $1.6 million in arrears was transferred to the County. The amount of fines in arrears has grown significantly since that time, which is consistent with the experience of other POA courts throughout the province. Haldimand County has utilized third-party collection of unpaid fines since 2007. An internal process of sending out letters prior to third parties being involved has been in place since 2012 and has proved successful. The province provided an additional collection tool in 2017 by expanding plate denial from parking offences to all outstanding driving-related fines. Staff also intend to pursue collection of certain larger arrears through Small Claims Court.

In 2018, Council approved the Provincial Offences Act Fine Collection & Write-Off Policy (Policy No. 2018-04) included as Attachment 1 to this report and approved the write-off of 1,255 pre-2001 POA fines transferred to Haldimand County that were deemed uncollectible and totalling $253,107.60. The policy provides guidelines to establish protocols and thresholds to determine when fines are deemed uncollectable and eligible for write-off. The policy's intent is to ensure staff are demonstrating due diligence with respect to the collection and write-off of POA arrears and includes the requirement for staff to annually review outstanding fines to identify those that should be recommended for write-off, followed by a report to Council to obtain approval. Prior to the policy being in place, staff could only write-off fines for deceased persons where a death certificate had been received.

The policy applies to fines in arrears of eight years or more. All reasonable efforts continue to be made to collect any outstanding fine with the tools available and with the option to write-off only being used as a last resort measure where all other collection means have been exhausted.

Section 6.1 of the policy, as outlined below, stipulates the various collection activities that must have been applied and exhausted in order to provide sufficient evidence to consider recommending the write-off of an outstanding fine.

Collection Method	Timeframe
Notices of Fine and Due Date	1 letter for each individual fine that remains unpaid 45 Days after conviction and automatically generated by the Ministry of the Attorney General (MAG)
Consideration of an extended payment plan	Any time after conviction, upon request of the defendant and with approval currently at the discretion of the Justice of the Peace
Collections Notice of Unpaid Fine(s) (Internal collection letter)	1 letter sent out after the Notice of Fine and Due Date is sent out but prior to driver's licence suspensions and Third Party Collection Agency referrals
Suspension of driver's licence through the Ministry of Transportation (MTO), if applicable	Carried out approximately 30 days after the Notice of Fine and Due Date is sent out where no response received and failing all other attempts to collect
Licence Plate denial program through the MTO effective as of May 1, 2017, if applicable	Occurs 45 days after an unpaid Parking fine has been transferred to the Provincial Offences office and 66 days for unpaid Highway Traffic Act fines
Use of Third Party Collection Agencies	All unpaid accounts are referred to the County's Collection Agencies 60 days after conviction and are subject to additional attempts to find and contact the defendant
Transfer of outstanding fines to tax roll if name on unpaid fine and property is identical	If applicable and at the discretion of the Treasurer, any time after the above methods have been exhausted
Civil enforcement measures through Small Claims Court, if applicable	Applicable on larger accounts previously uncollectable by collection agencies. Must have a fine value that warrants the cost of this process or civil enforcement is deemed necessary for other business reasons

ANALYSIS:

As at December 31, 2018, the County's current accumulated Provincial Offences arrears sits at $7,634,577 (the average of courts of similar annual charge volume size is approximately $6.7 million). A large portion of these arrears (approximately $1 million) includes additional fees that are required to be added to each fine once a defendant is convicted including a conviction fee of $5.00 (MAG Fee), a defaulted fee of $40 (MAG fee once the fine has gone unpaid for 66 days) and subsequently a collection fee which is added by the County once the account is transferred to a third party collection agency. Collection agency fees can range anywhere from 12 – 40 percent of the total owing, depending on whether the fine is in the name of an individual or a business and how difficult the fine has been to collect. The administration of Provincial Offences fines rests with the County's POA staff who continue to actively address collections using all resources available to them.

The 2018 approved write-offs have assisted with lowering the arrears from the pre-2001 transfer period; however, in their annual review, staff have identified additional defaulted fines that are considered candidates for write-off in 2019 and are presented in Attachment 2. Similar to the write-off list presented in 2018, the subject fines are defaulted fines where there is no ability to suspend a driver's licence for non payment. Additionally, further collection efforts would be unsuccessful due to factors such as:

- Incomplete/improper address in order to mail out notices or add the fine to the tax roll
- the individual is deceased but no death certificate has been received (verbal notification by a family member or an obituary in the paper are not sufficient evidence to permit staff to write-off a fine)
- there is no licence information in order to suspend a corresponding driver's licence
- the fine value did not meet the criteria to add it to the tax roll as the individual who received the ticket was not the sole owner of the property
- the fine was in the name of a company which has gone bankrupt and/or no longer exists

Staff are recommending that 1,152 Provincial Offences Act fines deemed uncollectable from the period of 1995 - 2008, totalling $238,561.73 be removed from outstanding POA arrears to clearly identify cases where active fine collection efforts have ceased. The subject fines are not considered eligible for additional collection efforts through Small Claims court action as their small value would not offset the costs involved in pursuing civil enforcement proceedings. During their review, staff did identify and pull 36 significant fines which they will investigate further as possible candidates to pursue through Small Claims court.

Should Council direct staff to proceed with writing-off the subject fines, completion of their write-off is still subject to MAG's review. Upon Council's approval, a write-off list will be forwarded to the Ministry by its June 21, 2019 deadline. Once received, MAG will provide a Preliminary Write-Off Report to the POA Court office. Subsequently, POA staff will review the list and all cases identified for write-off will be purged from the Ministry's database (ICON) on October 11, 2019.

Debts to the Crown are owed in perpetuity and as such, although they may be written off for accounting purposes and purged from the Ministry's database (ICON), they are still owed until paid. Should payment be received after an account has been written off, POA staff must record the payment as revenue with supporting documentation and then disburse it in accordance with established process.

FINANCIAL/LEGAL IMPLICATIONS:

The County uses cash basis accounting for POA fines, meaning that the revenue is not recorded until the fine is paid, regardless of when the fine was imposed. The approved 2019 budget for POA fines revenue is $400,000. POA fine collections have varied from year to year, mainly based on the number

of tickets issued, transfer of fines to the tax roll and occasional payment of large fines. This revenue is used to offset the fixed costs of staffing the POA Administration office.

A disclosure note in the County's annual financial statement reflects the current POA fine arrears. The arrears total of approximately $7,634,577 as at the end of 2018 represents a decrease of $139,804 from the end of year arrears total of $7,774,381 reflected in 2017. The decrease is reflective of arrears approved for write-off by Council in 2018 while taking into account payments received and any additional fines that were added to the County's arrears in the same year.

STAKEHOLDER IMPACTS:

If approved, staff will advise MAG of Council's direction and will proceed with next steps as far as purging the written-off fines from the Ministry's database (ICON).

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: No

Policy: No

ATTACHMENTS:

1. Policy No. 2018-04 Provincial Offences Act Fine Collection & Write-Off Policy
2. List of fines recommended for write-off in 2019

POLICY No. 2018-04

Provincial Offences Act Fine Collection & Write-Off Policy

Originating Department	Clerks Division		
Council in Committee:	2018-06-19	**Recommendation #:**	19
Council Approval:	2018-06-25	**Resolution #:**	92-18
Revision History:	Click here for revision history		

1. PURPOSE

The purpose of the Provincial Offences Act Fine Collection & Write-Off Policy is to provide an effective and proactive approach to the collection of fines and a process for the write-off of arrears that have been deemed uncollectible.

2. POLICY STATEMENT

The objective of the Provincial Offences Act (POA) collection and write-off process is to support efficient and responsible financial reporting that provides an accurate reflection of collectible POA revenue. The policy will provide guidelines and best practices to ensure staff are demonstrating due diligence with respect to the collection and write-off of POA arrears, as well as applying reasonable efforts to minimize the amount of accounts recommended for write-off on an annual basis.

3. DEFINITIONS

3.1. Integrated Courts Offense Network (ICON) – the provincially mandated database that POA offices are required to use as per the transfer agreement between the Province and Haldimand County.

3.2. MAG – Ministry of Attorney General

3.3. MTO – Ministry of Transportation

3.4. MOU – Memorandum of Understanding

3.5. POA – Provincial Offences Act

3.6. Uncollectable – a financial obligation, in this case a fine and any associated fees or charges, that have been deemed to have little or no chance of being collected.

3.7. Write-off – cessation of active collection activity and removal of accounts receivable from the ICON system and municipal financial statements.

4. LEGISLATIVE AUTHORITY

The collection of POA fines by municipalities and the remittance of dedicated fines, surcharges and fees that are payable to the Province and/or a municipality is legislated by the Province of Ontario. The regulations and authority related to this function is subject to the POA Transfer Agreement between Haldimand County and the Province and the related MOU with MAG.

5. SCOPE

5.1. The decision to write off POA accounts receivable that have been deemed uncollectible is a local decision, and is subject to the directives and operating guidelines outlined by MAG.

5.2. The municipality must ensure all available efforts to collect unpaid, defaulted fines have been exhausted prior to recommending any outstanding amounts for write-off.

5.3. Where any POA fine has been written off and any portion is subsequently paid, the requirements to remit certain funds to the Province of Ontario still apply, as set out in the POA Transfer Agreements and the *Provincial Offences Act*.

5.4. Writing off POA fines is for accounting purposes only and does not absolve a convicted offender from the requirement to pay the fine. Debts owed to the Crown are permanent and are never forgiven nor subject to the *Limitations Act.*

5.5. Collection activities related to a written off account may resume should conditions change and the account be deemed once again collectible.

5.6. Records must be retained with respect to the accounts being written-off to provide an audit trail to support any future reinstatement of collection efforts.

5.7. The municipality will ensure that equal treatment and efforts regarding the collection of all POA fines will be applied, without any regard to whether the resulting fine will be retained by the municipality or remitted to another third party.

5.8. The municipality must ensure that decisions to write off POA accounts receivable are justifiable and transparent.

6. POLICY FRAMEWORK

6.1. The following collection activities must have been applied and exhausted in order to provide sufficient evidence to consider recommending write-off of an outstanding fine:

Collection Method	Timeframe
Notices of Fine and Due Date	x1 Letter for each individual fine that remains unpaid 45 Days after conviction and automatically generated by MAG
Consideration of an extended payment plan	Any time after conviction, upon request of the defendant and with approval currently at the discretion of the Justice of the Peace
Collections Notice of Unpaid Fine(s) (Internal collection letter)	x1 Letter sent out after the Notice of Fine and Due Date is sent out but prior to driver's licence suspensions and Third Party Collection Agency referrals
Suspension of driver's licence through the MTO, if applicable	Automatically carried out 16-30 days after the Notice of Fine and Due Date is sent out where no response received and failing all other attempts to collect
Licence Plate denial program through the MTO (effective as of May 1, 2017), if applicable	Occurs concurrently with driver's licence suspension activities
Use of Third Party Collection Agencies	All unpaid accounts are referred to the County's Collection Agencies 60 days after conviction and are subject to additional attempts to find and contact the defendant
Transfer of outstanding fines to tax roll if name is identical	If applicable and at the discretion of the Treasurer, any time after the above methods have been exhausted
Civil enforcement measures through Small Claims Court, if applicable	On larger accounts, previously uncollectible by a collection agencies, with a fine value that warrants the cost of this process or civil enforcement is deemed necessary for other business reasons

6.2. The threshold for the write-off of outstanding POA fines is limited to the following:

a. Any outstanding fine that is eight years or older (as of January 1st of the current year) and where all available collection efforts have been exhausted;

b. Any case where the collection options are not available due to a company in default with satisfactory proof of dissolution, inactive status or bankruptcy (satisfactory proof includes articles of dissolution, notice of bankruptcy or Ministry notification that the corporation is inactive/cancelled);

c. Any outstanding balance of $25.00 or less resulting from incomplete payment of fines (i.e. an individual paid the fine but did not pay the added costs) and where the remaining balance owing has been in default for a minimum of two years (as of January 1st of the current year);

d. Any fine of a deceased person for whom a death certificate has been received.

6.3. The following information is required in support of a recommendation for write-off and shall be noted within the supporting documentation pertaining to each fine for use in the POA office only:

a. Copy of original Certificate of Offence or Part II Information;

b. Record of additional costs and fees included in the outstanding amount;

c. Indication of the collection activities utilized;

d. Reason the write-off is recommended.

6.4. For any POA fine that has been written-off and purged from ICON whereby a portion of that account is subsequently paid, the account related to the payment must be re-entered into ICON so the payment can be recorded as revenue. All monies received related to any fines, surcharges and fees that are payable to the Province of Ontario must be remitted, in a timely manner, to the Province as outlined in Section 165(5) of the *Provincial Offences Act*.

6.5. By way of the Annual POA Report to MAG, information related to the total value of all fines deemed "uncollectible" and written-off in a fiscal period must be provided to the MAG, POA Unit.

7. PROCEDURE

7.1. In February of each year, POA staff will compile a report indicating the outstanding fines. This report will be analyzed as to the collection steps outlined in Section 6.1 of this policy which will be used to identify any gaps in previous collections attempts or deem fines as uncollectable where all collection methods have been exhausted.

7.2. The report will be reviewed by the POA Supervisor to determine the potential fines that should be recommended for write-off, followed by a report to Council to obtain approval.

7.3. Upon approval from Council and in accordance with MAG's annual write-off timelines, POA staff will notify the Ministry of the Council approved write-offs and forward the supporting documentation related to each fine including the date of the offence, the defendant's name, the total amount owing and any related fees added to the fine such as the Victim Fine Surcharge and Collection Agency fees.

7.4. MAG will produce a Preliminary Write-off Report for the municipality to review and approve.

7.5. The final write-offs will be completed by MAG following confirmation of the amounts and approval to proceed from the County.

REVISION HISTORY					
REPORT	CIC		COUNCIL		DETAILS
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	
	Date	Rec#	Date	Res#	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
19950728	1160999002188865200	1	$187.32	
19980910	1160999003311085200	1	$184.45	
20000101	1160999005239783300	1	$89.73	
20000114	1160999005028999600	1	$111.76	
20000115	1160999005028814600	1	$162.13	
20000118	1160999005378724100	1	$556.45	
20000128	1160999005239785800	1	$49.39	
20000129	1160999005028853400	1	$111.76	
20000212	11609990019600	1	$107.04	
20000212	1160999005239823400	1	$89.73	
20000220	1160999005028903000	1	$289.85	
20000224	1160999005028724300	1	$110.05	
20000226	1160999005029135400	1	$105.47	
20000226	1160999005028724400	1	$110.05	
20000229	1160999005239799200	1	$111.76	
20000304	1160999005239805800	1	$110.05	
20000317	1160999005028724200	1	$110.05	
20000318	1160999005028724500	1	$110.05	
20000318	1160999005028966900	1	$212.51	
20000319	1160999005028724600	1	$110.05	
20000323	1160999005029093700	1	$173.29	
20000323	1160999005029093800	1	$146.50	
20000330	11609990005600	2	$626.20	
20000330	1160999005028877800	1	$420.05	
20000401	1160999005028724800	1	$116.25	
20000403	1160999005378586900	1	$116.25	
20000430	11609990103300	1	$321.12	
20000430	11609990103400	1	$321.12	
20000513	1160999005378614400	1	$406.29	
20000513	1160999005378614300	1	$357.36	
20000514	1160999005378612900	1	$193.62	
20000520	1160999005378756800	1	$193.62	
20000520	1160999005028879600	1	$116.25	
20000522	1160999005378545400	1	$296.05	
20000522	1160999005378545300	1	$426.25	
20000527	1160999005377306800	1	$118.06	
20000527	1160999005378757100	1	$79.05	
20000531	1160999005239761200	1	$118.06	
20000603	1160999005377255300	1	$29.45	
20000610	1160999005377732300	1	$429.97	
20000610	1160999005378757300	1	$118.06	
20000611	1160999005377225400	1	$190.65	
20000611	1160999005377225500	1	$193.62	
20000612	1160999005378767000	1	$193.62	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20000620	1160999005378599000	1	$118.06	
20000621	11609990020100	1	$173.60	
20000705	1160999005377292600	1	$118.06	
20000707	1160999005377265100	1	$193.62	
20000716	1160999005377322100	1	$2.50	
20000723	1160999005378610100	1	$118.06	
20000723	1160999005378767100	1	$193.62	
20000723	1160999005377748400	1	$179.12	
20000731	1160999005378760200	1	$190.65	
20000805	1160999005377322700	1	$193.62	
20000806	1160999005378610600	1	$118.06	
20000807	1160999005377312800	1	$116.25	
20000807	1160999005377312900	1	$116.25	
20000811	1160999005377265700	1	$193.62	
20000812	1160999005377322900	1	$179.12	
20000819	1160999005378547300	1	$187.32	
20000819	1160999005378547400	1	$118.06	
20000819	1160999005378547800	1	$116.25	
20000824	1160999005028904700	1	$439.18	
20000826	1160999005378749100	1	$155.84	
20000826	1160999005377766300	1	$184.45	
20000902	1160999005377321400	1	$193.62	
20000903	1160999005378761300	1	$179.12	
20000904	1160999005378746700	1	$153.45	
20000924	1160999005377266300	1	$165.85	
20000924	1160999005377811800	1	$109.22	
20000930	1160999005377791900	1	$118.06	
20001007	1160999005378126300	1	$165.85	
20001011	1160999005377269500	1	$168.43	
20001014	1160999005377315100	1	$432.45	
20001028	1160999005377754800	1	$196.85	
20001029	1160999005377169300	1	$118.06	
20001029	1160999005377169200	1	$193.62	
20001031	1160999005377166900	1	$439.18	
20001031	1160999005377167000	1	$439.18	
20001104	1160999005377315800	1	$439.18	
20001104	1160999005377315900	1	$351.03	
20001104	1160999005377316100	1	$426.59	
20001104	1160999005377316200	1	$300.66	
20001114	1160999005377146800	1	$243.99	
20001119	1160999005377822400	1	$111.76	
20001126	11609990039700	1	$297.08	
20010103	1160999005377257700	1	$118.06	
20010122	1160999005377168200	1	$374.26	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20010126	1160999005377184100	1	$118.06	
20010203	1160999005377804300	1	$193.62	
20010204	1160999005377197000	1	$109.22	
20010204	1160999005377212200	1	$118.06	
20010205	1160999005377133300	1	$118.06	
20010210	1160999005378131400	1	$351.03	
20010216	1160999005377746100	1	$105.47	
20010216	1160999005377253800	1	$118.06	
20010222	1160999005377198600	1	$165.85	
20010227	1160999005377254000	1	$118.06	
20010309	1160999005377148300	1	$420.05	
20010322	1160999005377355300	1	$109.22	
20010324	1160999005377280800	1	$190.65	
20010403	1160999006499725500	1	$165.85	
20010404	1160999006499712900	1	$116.25	
20010407	1160999006499688200	1	$64.27	
20010412	1160999006499698000	1	$118.06	
20010414	1160999006499915100	1	$109.22	
20010420	1160999006499726100	1	$168.43	
20010422	1160999006499693000	1	$432.45	
20010429	1160999006499851300	1	$211.16	
20010429	1160999006499851400	1	$406.29	
20010502	1160999006499665000	1	$113.34	
20010503	1160999006499671600	1	$190.65	
20010509	116099901015200	2	$793.36	
20010518	1160999006500148800	1	$155.82	
20010518	1160999006499830200	1	$116.25	
20010519	1160999006499861400	1	$118.06	
20010519	1160999006499830600	1	$190.65	
20010519	1160999006499879900	1	$190.65	
20010520	1160999006499899200	1	$439.18	
20010520	1160999006499899300	1	$96.02	
20010520	1160999006499915600	1	$118.06	
20010522	1160999006499714900	1	$168.43	
20010528	116099901007900	1	$4,524.00	Bankrupt
20010528	116099901008000	1	$4,524.00	Bankrupt
20010528	116099901005600	1	$7,304.55	Bankrupt
20010602	1160999006499932600	1	$190.65	
20010603	1160999006499733600	1	$190.65	
20010609	1160999006499937800	1	$94.66	
20010609	1160999006499937700	1	$406.29	
20010616	1160999006499695000	1	$184.45	
20010622	1160999006499876500	1	$184.45	
20010623	1160999006499876800	1	$193.62	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20010624	1160999006500178000	1	$193.62	
20010624	1160999006499938700	1	$109.22	
20010701	1160999006499993600	1	$190.65	
20010707	1160999006499752000	1	$118.06	
20010707	1160999006499916000	1	$109.22	
20010707	1160999006499642600	1	$155.84	
20010710	1160999006500165200	1	$579.28	
20010713	1160999006499693300	1	$300.66	
20010713	1160999006500180100	1	$202.42	
20010716	1160999006500222400	1	$218.80	
20010716	1160999006500222500	1	$202.42	
20010718	1160999006499866400	1	$179.12	
20010727	1160999006500179600	1	$193.62	
20010728	1160999006499918900	1	$118.06	
20010729	1160999006500180000	1	$109.22	
20010801	1160999006500048600	1	$80.28	
20010803	1160999006499995800	1	$193.62	
20010804	1160999006499647900	1	$109.22	
20010805	1160999006500183500	1	$190.65	
20010811	1160999006500001700	1	$118.06	
20010811	1160999006500004400	1	$228.25	
20010817	1160999006500184300	1	$190.65	
20010818	1160999006499802700	1	$129.08	
20010821	1160999006499778800	1	$404.84	
20010821	1160999006499778900	1	$154.36	
20010828	1160999006499712000	1	$116.49	
20010902	1160999006500195100	1	$107.76	
20010907	1160999006500088700	1	$294.50	
20010910	1160999006499979800	1	$189.10	
20010917	1160999006499729300	1	$107.76	
20010921	1160999006500127600	1	$94.45	
20010921	1160999006500127700	1	$116.49	
20010925	1160999006500089100	1	$114.70	
20010928	11609990107400	3	$176.30	
20011002	1160999006500091500	1	$154.36	
20011007	1160999006500130900	1	$166.86	
20011011	1160999006499999700	1	$404.84	
20011011	1160999006499797700	1	$116.49	
20011015	1160999006500000000	1	$437.61	
20011022	1160999006500071800	1	$28.33	
20011107	1160999006500059600	1	$114.70	
20011107	1160999006500059700	1	$189.10	
20011110	1160999006500108000	1	$192.04	
20011110	1160999006499788500	1	$107.76	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20011111	1160999006500110600	1	$192.04	
20011114	1160999006499795700	1	$108.50	
20011115	1160999006499812200	1	$72.41	
20011216	1160999006500127100	1	$192.04	
20011218	1160999006586744500	1	$154.26	
20020101	1160999006586771700	1	$142.71	
20020106	1160999006586794300	1	$166.86	
20020110	1160999006500138900	1	$437.61	
20020110	1160999006500138800	1	$399.83	
20020120	1160999006499799100	1	$430.90	
20020128	1160999006587086800	1	$341.93	
20020128	1160999006587086900	1	$393.19	
20020201	1160999006587095000	1	$116.49	
20020216	1160999006500109800	1	$437.61	
20020226	1160999006586792900	1	$430.90	
20020312	1160999006500165600	1	$582.43	
20020320	1160999006586597200	1	$113.34	
20020330	1160999006586897300	1	$164.30	
20020405	1160999006586657300	1	$111.60	
20020410	1160999006587078100	1	$116.49	
20020410	1160999006587078000	1	$209.87	
20020412	1160999006586927400	1	$164.30	
20020413	1160999006587051200	1	$166.86	
20020413	116099902018300	1	$176.30	
20020417	1160999006586606000	1	$192.04	
20020418	1160999006587041200	1	$192.04	
20020418	1160999006499969000	1	$192.04	
20020419	11609990205500	1	$793.36	
20020430	1160999006586975900	1	$203.06	
20020502	1160999006586901400	1	$154.26	
20020509	1160999006586988600	1	$77.50	
20020511	1160999006500025300	1	$107.76	
20020511	1160999006500025100	1	$116.49	
20020519	1160999006500186400	1	$116.49	
20020519	1160999006586986700	1	$113.34	
20020519	1160999006586986800	1	$113.34	
20020529	1160999006587111600	1	$108.50	
20020530	1160999006587104100	1	$437.61	
20020530	1160999006587104000	1	$168.43	
20020601	1160999006586987700	1	$437.61	
20020602	1160999006586690000	1	$114.70	
20020608	1160999006587188800	1	$116.49	
20020609	1160999006587139200	1	$192.04	
20020611	1160999006587113600	1	$189.10	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20020615	1160999006499848700	1	$114.70	
20020619	1160999006953349800	1	$199.95	
20020619	1160999006953349900	1	$430.90	
20020626	1160999006587112300	1	$108.50	
20020627	1160999006953170600	1	$192.04	
20020629	1160999006587048200	1	$114.70	
20020629	1160999006587048400	1	$192.04	
20020707	1160999006586696000	1	$107.76	
20020708	1160999006586681800	1	$204.64	
20020708	1160999006586681600	1	$166.86	
20020721	1160999006587185200	1	$116.49	
20020721	1160999006587185300	1	$116.49	
20020725	1160999006587152300	1	$114.70	
20020728	1160999006953423000	1	$166.86	
20020728	1160999006500176800	1	$192.04	
20020803	1160999006953362700	1	$166.86	
20020803	1160999006953362800	1	$437.61	
20020803	116099902033100	1	$316.20	
20020803	1160999006587150400	1	$154.26	
20020803	1160999006500177000	1	$164.30	
20020810	1160999006499934200	1	$192.04	
20020812	1160999006953401600	1	$362.05	
20020815	1160999006953096200	1	$116.49	
20020815	1160999006953096100	1	$116.49	
20020817	1160999006587122800	1	$116.49	
20020817	1160999006953363800	1	$26.21	
20020818	1160999006953364000	1	$192.04	
20020821	1160999006953344000	1	$189.10	
20020828	1160999006953118800	1	$189.10	
20020828	1160999006953118900	1	$114.70	
20020829	1160999006586683200	1	$116.49	
20020830	116099904000901	3	$3,066.40	Deceased
20020830	1160999006953344200	1	$114.70	
20020830	1160999006586683300	1	$122.78	
20020830	1160999006586659400	1	$192.04	
20020831	1160999006587206600	1	$177.66	
20020920	1160999006953343100	1	$122.78	
20020921	1160999006953400600	1	$114.70	
20020922	1160999006953417700	1	$116.49	
20020927	1160999006586649000	1	$393.19	
20021009	1160999006586808500	1	$207.78	
20021027	1160999007074731500	1	$114.70	
20021102	1160999006953042100	1	$122.78	
20021103	1160999007074736100	1	$75.56	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20021110	1160999007074722500	1	$166.86	
20021110	1160999006953092400	1	$166.86	
20021112	1160999007074705700	1	$492.90	
20021112	1160999007074705800	1	$164.30	
20021123	1160999006953092700	1	$437.61	
20021123	1160999006953092800	1	$166.86	
20021123	1160999006953092600	1	$437.61	
20021130	1160999007074736900	1	$116.49	
20021223	1160999007074774100	1	$428.42	
20021224	1160999006953037800	1	$116.49	
20021229	1160999006953425600	1	$430.90	
20021229	1160999006953425700	1	$199.95	
20021229	1160999006953059200	1	$224.26	
20030104	1160999007074743900	1	$192.04	
20030201	1160999007074896600	1	$192.04	
20030203	116099903008500	1	$781.20	
20030210	1160999007074748200	1	$242.42	
20030210	1160999007074748100	1	$437.61	
20030210	116099903008400	1	$824.60	
20030210	116099903008600	1	$781.20	
20030214	1160999007074883000	1	$396.68	
20030215	1160999007074863600	1	$192.04	
20030221	1160999007074854300	1	$166.86	
20030221	1160999007074854400	1	$93.00	
20030221	1160999007074727600	1	$116.49	
20030227	11609990301500	1	$168.93	
20030306	116099903003700	1	$1,421.90	Deceased
20030310	1160999007074773100	1	$151.90	
20030310	1160999007074773200	1	$111.60	
20030321	1160999006953070600	1	$192.04	
20030323	116099903007400	3	$799.66	
20030327	1160999007074791000	1	$107.76	
20030329	1160999007074877800	1	$189.10	
20030419	1160999007074752900	1	$116.49	
20030419	1160999007074836000	1	$317.97	
20030427	1160999007074850300	1	$437.61	
20030502	1160999006953328900	1	$185.75	
20030503	1160999006953309500	1	$114.70	
20030510	1160999007074821500	1	$114.70	
20030518	1160999006953168900	1	$437.61	
20030519	1160999006499641600	1	$177.66	
20030522	1160999007074843100	1	$116.49	
20030530	1160999006953201000	1	$154.26	
20030604	1160999006953135700	1	$192.04	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20030604	1160999006953135800	1	$192.04	
20030606	1160999007074800700	1	$116.49	
20030609	1160999006953223600	1	$164.30	
20030615	1160999006953226200	1	$192.04	
20030616	1160999006953116500	1	$177.66	
20030622	1160999007421748500	1	$506.87	
20030624	1160999006953227200	1	$116.49	
20030626	1160999006587164800	1	$192.04	
20030702	1160999006953315100	1	$192.04	
20030702	1160999006953313900	1	$116.49	
20030703	1160999006953314000	1	$107.76	
20030705	1160999006953322500	1	$114.70	
20030712	1160999006953164200	1	$116.49	
20030714	1160999007074904900	1	$192.04	
20030714	1160999006953220600	1	$430.90	
20030714	1160999006953139200	1	$114.70	
20030714	1160999006953139100	1	$189.10	
20030718	1160999006953118200	1	$406.10	
20030719	1160999006587224100	1	$192.04	
20030724	1160999006953322800	1	$116.49	
20030726	1160999006953210200	1	$189.10	
20030726	1160999006953204000	1	$114.70	
20030726	116099903044900	3	$565.03	
20030726	1160999007421696200	1	$177.66	
20030726	1160999007421695500	1	$192.04	
20030729	1160999007421725200	1	$192.04	
20030730	1160999006500192000	1	$192.04	
20030801	1160999006587224800	1	$192.04	
20030801	1160999006587222300	1	$217.23	
20030802	1160999007421552900	1	$192.04	
20030802	1160999006953149700	1	$114.70	
20030803	1160999006499642800	1	$119.41	
20030804	1160999007421610800	1	$116.49	
20030804	1160999006953161200	1	$189.10	
20030807	1160999006499680100	1	$192.04	
20030809	1160999007421611100	1	$437.61	
20030809	1160999007421727100	1	$189.10	
20030810	1160999007421615300	1	$177.66	
20030810	1160999007421611300	1	$116.49	
20030812	1160999007421615400	1	$192.04	
20030817	1160999007421636600	1	$164.56	
20030817	1160999007421636700	1	$404.84	
20030817	1160999007421618100	1	$506.87	
20030817	1160999007421744700	1	$499.10	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20030817	1160999007421620700	1	$499.10	
20030818	1160999007074915100	1	$177.66	
20030820	1160999007421704800	1	$116.49	
20030821	1160999007421646400	1	$164.30	
20030823	1160999007421617500	1	$192.04	
20030823	1160999007421699800	1	$437.61	
20030823	1160999007421611600	1	$189.10	
20030828	1160999007421568100	1	$166.86	
20030927	1160999006499642100	1	$267.60	
20031004	1160999006499642200	1	$177.66	
20031005	1160999006953144000	1	$430.90	
20031005	1160999006953144100	1	$114.70	
20031006	1160999007421571200	1	$164.30	
20031007	1160999007421900700	1	$116.49	
20031012	1160999007074952500	1	$161.20	
20031014	1160999007421940200	1	$163.71	
20031018	1160999006953292200	1	$114.70	
20031018	1160999006953292300	1	$114.70	
20031024	1160999007421717900	1	$362.05	
20031024	1160999007421711600	1	$154.36	
20031026	1160999007421804900	1	$116.49	
20031030	1160999007421945600	1	$267.60	
20031030	1160999007421945700	1	$425.01	
20031107	1160999007421917700	1	$156.00	
20031107	1160999007421917600	1	$492.00	
20031122	1160999007421946100	1	$93.00	
20031129	1160999006586690300	1	$437.61	
20031205	116099904004600	6	$620.00	
20031213	1160999007421601700	1	$207.78	
20031213	1160999007421875400	1	$116.49	
20031218	1160999007421792600	1	$107.76	
20031218	1160999007421792700	1	$107.76	
20031222	1160999007421762800	1	$192.04	
20031222	1160999007421762900	1	$177.66	
20040101	1160999007421759000	1	$107.76	
20040102	1160999007421828300	1	$107.76	
20040102	1160999007421828200	1	$107.76	
20040212	1160999006587026200	1	$192.04	
20040228	1160999006500230500	1	$223.53	
20040302	1160999007421877400	1	$78.71	
20040303	11609990400700	2	$210.80	
20040314	1160999007421792000	1	$116.49	
20040318	1160999007804478900	1	$346.31	
20040318	1160999007804481400	1	$323.29	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20040319	1160999007806224300	1	$192.04	
20040322	1160999007421775100	1	$114.70	
20040402	1160999007804482100	1	$349.46	
20040403	1160999007806246800	1	$192.04	
20040404	1160999007806206100	1	$116.49	
20040408	1160999007806186100	1	$116.49	
20040502	1160999007421578600	1	$116.49	
20040511	1160999007421760300	1	$116.49	
20040511	1160999007421760700	1	$166.86	
20040516	1160999007806214200	1	$267.60	
20040516	1160999007806214100	1	$116.49	
20040516	1160999007421870100	1	$122.78	
20040518	1160999007806182000	1	$430.90	
20040523	11609990401900	2	$81.20	
20040523	1160999006499643200	1	$116.49	
20040523	1160999007806275200	1	$192.04	
20040524	1160999007806217100	1	$114.70	
20040605	1160999007806279000	1	$107.76	
20040611	1160999006500210100	1	$506.87	
20040619	1160999007806169700	1	$107.76	
20040619	1160999007806217900	1	$188.90	
20040626	1160999007421909800	1	$114.70	
20040702	1160999007806328100	1	$192.04	
20040702	1160999007806328200	1	$189.10	
20040703	1160999007806280100	1	$189.10	
20040704	1160999007806162100	1	$116.49	
20040707	1160999007806332600	1	$114.70	
20040713	1160999007806301100	1	$192.04	
20040716	1160999007806338000	1	$189.10	
20040717	1160999007806162700	1	$192.04	
20040719	1160999007806324600	1	$164.30	
20040805	1160999007804460000	1	$220.10	
20040814	1160999007421686800	1	$217.23	
20040814	1160999007806302800	1	$192.04	
20040819	1160999007808479200	1	$96.10	
20040819	1160999006953163300	1	$189.10	
20040824	1160999007806312100	1	$189.10	
20040825	1160999007806263100	1	$107.76	
20040828	1160999007808469700	1	$116.49	
20040904	1160999007421686900	1	$189.10	
20040905	1160999007808493900	1	$192.04	
20040906	1160999007806280500	1	$116.49	
20040917	1160999007806575900	1	$192.04	
20040917	1160999007806575800	1	$116.49	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20040927	116099904013100	1	$62.97	
20041001	1160999007806197200	1	$116.49	
20041023	1160999007806165700	1	$192.04	
20041111	1160999007808533900	1	$404.84	
20041114	1160999007808458700	1	$114.70	
20041119	1160999007808554400	1	$116.49	
20041120	1160999007806192700	1	$177.66	
20041126	1160999006499681200	1	$192.04	
20041216	1160999006499681400	1	$116.49	
20041216	1160999007808547700	1	$189.10	
20050110	1160999007806306100	1	$114.70	
20050220	1160999007806640200	1	$114.70	
20050224	1160999007808520400	1	$189.10	
20050225	1160999007806307000	1	$189.10	
20050227	1160999007806609200	1	$116.49	
20050228	1160999006953167300	1	$114.70	
20050304	116099905006000	3	$733.95	
20050319	1160999007421925300	1	$69.01	
20050321	116099905007300	1	$831.14	
20050321	116099905007200	1	$831.14	
20050331	1160999007805971500	1	$114.06	
20050408	1160999007808341400	1	$189.10	
20050412	1160999007806051600	1	$177.66	
20050412	1160999007808295700	1	$116.49	
20050421	1160999007808335800	1	$154.36	
20050505	1160999006499591500		$404.84	
20050508	1160999007806000900	1	$192.04	
20050520	1160999007421687300	1	$192.04	
20050520	1160999007421687100	1	$192.04	
20050521	1160999007805931300	1	$192.04	
20050521	1160999007805931400	1	$192.04	
20050522	1160999007808289100	1	$114.70	
20050528	1160999007805940900	1	$107.76	
20050602	1160999007805966200	1	$164.30	
20050602	1160999007805966100	1	$163.71	
20050605	1160999007807710100	1	$27.90	
20050605	1160999007807709700	1	$116.49	
20050605	1160999007807709800	1	$192.04	
20050610	1160999007805936300	1	$192.04	
20050610	1160999007808324600	1	$192.23	
20050610	1160999007805796600	1	$114.70	
20050610	1160999006587170900	1	$116.49	
20050611	1160999006500223500	1	$177.66	
20050617	1160999007806026100	1	$195.30	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20050619	1160999006953248800	1	$506.87	
20050621	11609990502100	3	$214.08	
20050623	1160999007805497600	1	$189.10	
20050624	1160999007805797300	1	$198.34	
20050626	116099905010900	4	$887.81	
20050627	1160999007805933200	1	$198.34	
20050627	1160999007805935300	1	$122.78	
20050627	1160999007805935500	1	$160.56	
20050701	1160999007806007900	1	$120.90	
20050703	1160999007804467600	1	$157.50	
20050709	1160999007805502000	1	$122.78	
20050709	1160999007805118700	1	$185.75	
20050709	1160999007805118600	1	$185.75	
20050714	116099905015000	4	$565.03	
20050715	1160999007806040100	1	$192.04	
20050717	1160999007421691100	1	$110.19	
20050730	1160999007807688900	1	$182.90	
20050730	1160999007804698000	1	$116.49	
20050731	1160999007805881600	1	$116.49	
20050803	1160999007805882100	1	$116.49	
20050804	1160999007808318400	1	$182.90	
20050805	1160999007805956800	1	$116.49	
20050813	1160999007421619100	1	$483.60	
20050814	1160999007805888900	1	$179.45	
20050818	1160999007805503400	1	$116.49	
20050821	1160999006499619600	1	$157.50	
20050821	1160999006499619500	1	$157.50	
20050821	1160999006499619400	1	$157.50	
20050821	1160999006953312300	1	$157.50	
20050904	1160999006499649000	1	$147.97	
20050904	1160999007805792100	1	$182.90	
20050907	1160999007805499200	1	$166.86	
20050907	1160999007805499300	1	$437.61	
20050912	1160999007805782200	1	$101.94	
20050914	1160999007804528000	1	$166.01	
20050919	1160999007808337700	1	$248.00	
20050930	1160999007806079100	1	$107.76	
20051015	1160999007805500400	1	$171.84	
20051015	1160999007805793100	1	$110.19	
20051016	1160999007806113700	1	$53.52	
20051017	1160999006587215100	1	$166.01	
20051023	1160999007804468000	1	$185.75	
20051023	1160999007804467900	1	$127.50	
20051031	1160999007805840000	1	$110.19	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20051123	1160999007808242100	1	$434.46	
20051126	1160999007806115400	1	$182.60	
20051202	1160999007808216400	1	$179.80	
20051203	11609990506700	1	$155.00	
20051223	1160999007808206400	1	$195.19	
20051223	1160999007808540000	1	$182.60	
20060108	1160999007807673900	1	$434.00	
20060108	1160999007807674100	1	$111.60	
20060108	1160999007807673800	1	$167.40	
20060113	1160999007805831100	1	$188.90	
20060203	1160999007806137300	1	$119.63	
20060206	1160999007806103800	1	$119.63	
20060217	1160999007805527200	1	$195.19	
20060219	1160999007805656700	1	$407.75	
20060219	1160999007805656600	1	$90.29	
20060219	1160999000603400	1	$442.70	
20060310	1160999007806086000	1	$31.48	
20060310	1160999007806085900	1	$168.93	
20060318	1160999007806104100	1	$113.34	
20060327	1160999007805658400	1	$440.76	
20060331	1160999007805833500	1	$111.60	
20060331	1160999007805833400	1	$434.00	
20060402	1160999007808247300	1	$113.34	
20060406	1160999007805907500	1	$90.29	
20060408	1160999007808180900	1	$113.34	
20060421	1160999007808465400	1	$522.61	
20060428	1160999007808195300	1	$113.34	
20060512	1160999007808268300	1	$69.26	
20060519	1160999007805917400	1	$186.00	
20060520	1160999007805751800	1	$174.75	
20060521	1160999007805918000	1	$170.01	
20060525	116099906009100	3	$570.85	
20060528	1160999007808205100	1	$113.34	
20060603	1160999007805677000	1	$186.00	
20060617	1160999007808167200	1	$440.20	
20060617	1160999007808167400	1	$174.75	
20060623	1160999007806464200	1	$113.34	
20060625	1160999007804499300	1	$186.00	
20060627	1160999007805933300	1	$122.78	
20060628	1160999006953313400	1	$160.00	
20060701	1160999007805753300	1	$142.60	
20060701	1160999006499647200	1	$142.60	
20060701	1160999007805678400	1	$113.34	
20060702	1160999007421851200	1	$113.34	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20060712	1160999007806518700	1	$440.76	
20060715	1160999007805744000	1	$188.90	
20060722	1160999007804821200	1	$111.60	
20060722	1160999007805852900	1	$188.90	
20060722	1160999007805846100	1	$157.28	
20060723	1160999007804829400	1	$104.85	
20060723	1160999007804829500	1	$407.75	
20060723	1160999007804829300	1	$157.28	
20060723	1160999007804829100	1	$273.78	
20060723	1160999007804829200	1	$157.28	
20060723	1160999007805709400	1	$186.00	
20060723	1160999007804829700	1	$113.34	
20060728	1160999007805836500	1	$180.58	
20060729	1160999007806488900	1	$111.60	
20060730	1160999007804853700	1	$148.80	
20060801	1160999007805848700	1	$180.58	
20060801	1160999007805848600	1	$195.19	
20060804	1160999007806486600	1	$96.10	
20060807	1160999007805101600	1	$308.73	
20060807	1160999007805101700	1	$308.73	
20060807	1160999007421576800	1	$174.75	
20060807	1160999007805136700	1	$162.00	
20060813	1160999007807351800	1	$618.00	
20060817	1160999007805676000	1	$440.76	
20060909	1160999007807664800	1	$188.90	
20060909	1160999007804826900	1	$186.00	
20060917	1160999007807666900	1	$174.75	
20060919	1160999006499805200	1	$116.25	
20060928	1160999007805684200	1	$188.90	
20060930	1160999007805714600	1	$111.60	
20061007	1160999007808489900	1	$113.34	
20061008	1160999007808440500	1	$97.60	
20061017	1160999007804825400	1	$113.34	
20061022	1160999007805841600	1	$186.00	
20061102	1160999007805517900	1	$104.85	
20061111	1160999007805713500	1	$186.00	
20061120	1160999006587027400	1	$188.90	
20061121	1160999007805727000	1	$186.00	
20061129	1160999006587027600	1	$107.04	
20061130	1160999007806474200	1	$113.34	
20061205	1160999006587027500	1	$107.04	
20061229	1160999007805679800	1	$170.01	
20061229	1160999007805679900	1	$440.76	
20061229	1160999007805680000	1	$113.34	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20070109	1160999007808185000	1	$111.60	
20070117	1160999007806934200	1	$188.90	
20070118	1160999007806911300	1	$188.90	
20070119	1160999007806931200	1	$113.34	
20070120	1160999007806916300	1	$113.34	
20070127	1160999007806934800	1	$245.56	
20070127	1160999007806934900	1	$302.23	
20070127	1160999007806935000	1	$440.76	
20070201	1160999007808302900	1	$333.71	
20070209	1160999007806935100	1	$96.10	
20070223	1160999007806096900	1	$188.90	
20070302	1160999007806914300	1	$188.90	
20070307	1160999007805680300	1	$97.60	
20070310	1160999007806910000	1	$23.30	
20070311	1160999007806064400	1	$440.76	
20070314	1160999007808189300	1	$138.52	
20070317	1160999007806857300	1	$188.90	
20070331	1160999007805512600	1	$104.85	
20070408	1160999007808190200	1	$186.00	
20070409	1160999007804519400	1	$251.86	
20070413	11609990704400	1	$37.20	
20070415	1160999007805614300	1	$186.00	
20070419	1160999007805525500	1	$483.57	
20070419	1160999007805525600	1	$440.76	
20070419	1160999007807043800	1	$104.85	
20070427	1160999007805259200	1	$434.00	
20070429	1160999007805653600	1	$0.80	
20070512	1160999007805529800	1	$174.75	
20070512	1160999007807048800	1	$188.90	
20070519	1160999007804854100	1	$105.12	
20070519	1160999007807045000	1	$111.60	
20070519	1160999007808407500	1	$217.00	
20070602	1160999007805738200	1	$186.00	
20070608	1160999007807348600	1	$25.19	
20070609	1160999007805033600	1	$113.34	
20070612	1160999007807045900	1	$113.34	
20070616	1160999007806944800	1	$155.00	
20070622	1160999007805986200	1	$174.75	
20070623	1160999007804680800	1	$188.90	
20070623	1160999007805558100	1	$188.90	
20070624	1160999007805491700	1	$113.34	
20070701	1160999007804973700	1	$174.75	
20070701	1160999007805120700	1	$111.60	
20070702	1160999007805046700	1	$195.19	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20070707	1160999007805047300	1	$117.80	
20070709	1160999007807027400	1	$113.34	
20070714	1160999007805042100	1	$111.60	
20070716	1160999007804577100	1	$167.40	
20070720	1160999007804577300	1	$292.42	
20070721	1160999007805491800	1	$111.60	
20070721	1160999007805602000	1	$195.00	
20070722	1160999007804975600	1	$116.50	
20070725	1160999007807239100	1	$186.00	
20070726	1160999007805001600	1	$113.34	
20070727	1160999007808414400	1	$111.60	
20070729	1160999006587028000	1	$245.00	
20070802	1160999007806949300	1	$170.01	
20070802	1160999007806949200	1	$440.76	
20070802	1160999007806949400	1	$113.34	
20070802	1160999007806949500	1	$113.34	
20070803	1160999007807711100	1	$111.60	
20070804	1160999007805559800	1	$186.00	
20070804	1160999007805560000	1	$111.60	
20070804	1160999007805559900	1	$111.60	
20070805	1160999007806966700	1	$111.60	
20070805	116099907046200	1	$434.46	
20070807	1160999007807212200	1	$170.01	
20070810	1160999007807001800	1	$167.40	
20070815	1160999007808386100	1	$104.85	
20070815	1160999007805000600	1	$104.85	
20070815	1160999007805000500	1	$113.34	
20070815	1160999007806966800	1	$97.60	
20070820	116099907014800	1	$25.19	
20070901	1160999007805199200	1	$113.34	
20070901	1160999007807157700	1	$111.60	
20070901	1160999007805876500	1	$230.38	
20070903	1160999007808261600	1	$104.85	
20070908	1160999007807218000	1	$242.20	
20070908	1160999007808361200	1	$113.34	
20070908	1160999007805128800	1	$266.60	
20070916	1160999007807244200	1	$188.90	
20070916	1160999007807244100	1	$113.34	
20070916	1160999007804640000	1	$245.00	
20070923	1160999007805172800	1	$170.01	
20070924	1160999007808229300	1	$119.63	
20070925	1160999007808229900	1	$170.01	
20070927	1160999007807011400	1	$105.40	
20070928	1160999007805218800	1	$440.76	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20070928	1160999007805218700	1	$170.01	
20070930	116099907017900	2	$617.06	
20070930	1160999007805343700	1	$270.75	
20070930	1160999007805343800	1	$428.16	
20071005	1160999007807037200	1	$178.25	
20071006	1160999007808186700	1	$186.00	
20071007	1160999007804602200	1	$170.01	
20071008	1160999007804874700	1	$434.00	
20071008	116099907021400	1	$210.80	
20071008	1160999007804638200	1	$440.76	
20071008	1160999007804638300	1	$170.01	
20071009	1160999007807171800	1	$440.76	
20071019	1160999007807343600	1	$333.71	
20071024	1160999007805237100	1	$97.60	
20071028	1160999007804888500	1	$111.60	
20071104	1160999007804605400	1	$468.46	
20071108	1160999007805076200	1	$168.93	
20071118	1160999007804949600	1	$440.76	
20071123	1160999007808402400	1	$170.01	
20071124	1160999007804911900	1	$188.90	
20071124	1160999007804911800	1	$188.90	
20071128	1160999007804872200	1	$434.00	
20071203	1160999007806548600	1	$113.34	
20071210	1160999007806761100	1	$188.90	
20071210	1160999007806849100	1	$113.34	
20071222	1160999007807159400	1	$113.34	
20071226	1160999007808356200	1	$113.34	
20071230	1160999007806784100	1	$434.00	
20080105	1160999007806788800	1	$167.40	
20080118	1160999007804950500	1	$111.60	
20080124	1160999007806383100	1	$440.76	
20080124	1160999007806383200	1	$81.85	
20080201	1160999007807443600	1	$113.34	
20080208	1160999006587212900	1	$233.00	
20080302	11609990802200	3	$297.84	
20080306	1160999007807160700	1	$188.90	
20080311	1160999007807379700	1	$80.60	
20080311	1160999007807379800	1	$167.40	
20080315	1160999007806839700	1	$167.40	
20080315	1160999007806430100	1	$434.46	
20080317	1160999007805626800	1	$75.73	
20080324	116099908012500	3	$875.21	
20080401	1160999007807430800	1	$114.85	
20080403	1160999007806833200	1	$97.60	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20080406	1160999007807473600	1	$440.76	
20080418	1160999007806658700	1	$170.01	
20080418	1160999007806802300	1	$157.28	
20080418	1160999007806802400	1	$167.40	
20080419	1160999007807505300	1	$144.82	
20080420	116099908011300	1	$1,080.00	Bankrupt
20080502	1160999007806670500	1	$65.00	
20080510	1160999007805299600	1	$186.00	
20080510	1160999007807468800	1	$104.85	
20080510	1160999007807468900	1	$113.34	
20080511	1160999007807856200	1	$113.34	
20080511	1160999007807856300	1	$188.90	
20080511	1160999007807856100	1	$113.34	
20080516	1160999007807861100	1	$111.60	
20080521	1160999007807861700	1	$111.60	
20080521	1160999007807861800	1	$167.40	
20080521	1160999007807861600	1	$434.00	
20080524	1160999007807440700	1	$104.85	
20080524	1160999007807469200	1	$188.90	
20080528	1160999006587218100	1	$251.86	
20080528	1160999007807482000	1	$188.90	
20080601	1160999007807891700	1	$186.00	
20080602	1160999007807273900	1	$188.90	
20080602	1160999006586993700	1	$107.76	
20080603	1160999007804860400	1	$188.90	
20080603	1160999007804860500	1	$188.90	
20080606	1160999007807271100	1	$188.90	
20080607	1160999007807278600	1	$113.34	
20080607	1160999007807261300	1	$104.85	
20080607	1160999007808641100	1	$113.34	
20080613	1160999007807889000	1	$170.01	
20080613	1160999007805173900	1	$111.60	
20080613	1160999007805175200	1	$111.60	
20080615	1160999007806678000	1	$220.38	
20080615	1160999007805296400	1	$111.60	
20080615	1160999007805296300	1	$113.34	
20080620	1160999007807521300	1	$182.60	
20080622	1160999007805578500	1	$25.19	
20080622	1160999007805578400	1	$31.48	
20080626	1160999007807857900	1	$111.60	
20080626	116099908019700	2	$197.20	
20080627	1160999007805129500	1	$220.38	
20080627	1160999007807453100	1	$96.10	
20080628	1160999007806678300	1	$174.75	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20080629	1160999007421623700	1	$125.93	
20080629	1160999007421623800	1	$226.67	
20080705	1160999007807522200	1	$186.00	
20080705	116099908018200	2	$680.02	
20080705	1160999007805121200	1	$205.00	
20080711	1160999007807693800	1	$483.60	
20080712	1160999007807694400	1	$491.13	
20080712	1160999007805787200	1	$491.13	
20080715	1160999007804584400	1	$125.93	
20080718	1160999007807522900	1	$186.00	
20080718	1160999007807003700	1	$186.00	
20080719	1160999007805386200	1	$113.34	
20080720	1160999007805057700	1	$188.90	
20080727	1160999007805130500	1	$217.00	
20080729	1160999009537067900	1	$105.40	
20080729	1160999009537067700	1	$99.03	
20080802	1160999009536990100	1	$104.85	
20080808	1160999007808061600	1	$168.93	
20080810	1160999007807893200	1	$170.01	
20080814	1160999007808622200	1	$156.21	
20080814	1160999007808622100	1	$60.65	
20080815	1160999007808073600	1	$113.34	
20080815	1160999007807981700	1	$186.00	
20080815	1160999007807981200	1	$174.75	
20080815	1160999007805431400	1	$434.00	
20080816	1160999007806893300	1	$113.34	
20080816	1160999007805387100	1	$186.00	
20080816	1160999007807992200	1	$170.01	
20080816	1160999007807984200	1	$104.85	
20080816	1160999007808054000	1	$113.34	
20080817	1160999007805387500	1	$186.00	
20080823	1160999009537088100	1	$188.90	
20080826	1160999007806893400	1	$113.34	
20080828	1160999007808566800	1	$80.60	
20080830	1160999009537088800	1	$186.00	
20080830	1160999009537088700	1	$186.00	
20080830	1160999007807994300	1	$167.40	
20080831	1160999007808611400	1	$186.00	
20080831	1160999007808611500	1	$113.34	
20080906	1160999007805390500	1	$104.85	
20080909	1160999007805403600	1	$111.60	
20080912	1160999007805401200	1	$174.75	
20080913	1160999007805403700	1	$111.60	
20080914	1160999007808034100	1	$113.34	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20080918	1160999007808636300	1	$97.60	
20080926	1160999007808100000	1	$148.80	
20080930	1160999007808594200	1	$167.40	
20080930	1160999007807988800	1	$157.28	
20081007	1160999007807958900	1	$135.00	
20081009	1160999007807989900	1	$157.28	
20081010	1160999007807260800	1	$167.40	
20081010	1160999007807995600	1	$188.90	
20081017	1160999007808622500	1	$107.04	
20081017	1160999007808622600	1	$182.60	
20081213	1160999007808011100	1	$188.90	
20081213	1160999007808011200	1	$113.34	
20081217	1160999007808136200	1	$113.34	
20081229	1160999007808116900	1	$167.40	
20090101	1160999007804723800	1	$167.40	
20090101	1160999007804723700	1	$434.00	
20090105	1160999007804857000	1	$96.10	
20090109	1160999009537061200	1	$170.01	
20090118	1160999007808045900	1	$150.00	
20090130	1160999007808006400	1	$150.00	
20090211	1160999009537377800	1	$104.85	
20090214	1160999007805825000	1	$113.34	
20090301	1160999007808057400	1	$104.85	
20090301	1160999009537447700	1	$111.60	
20090303	1160999007804725400	1	$258.16	
20090306	1160999007807970500	1	$111.60	
20090307	1160999009536986800	1	$104.85	
20090307	1160999009536986900	1	$174.75	
20090307	1160999009536987000	1	$174.75	
20090322	1160999009536987100	1	$174.75	
20090327	1160999007804524700	1	$251.86	
20090327	1160999007804524600	1	$251.86	
20090328	1160999009536883200	1	$440.76	
20090329	1160999009536883300	1	$227.18	
20090402	1160999009537394900	1	$113.34	
20090404	1160999009537428000	1	$157.28	
20090410	1160999009536952000	1	$113.34	
20090412	1160999009537095500	1	$111.60	
20090416	1160999007806675600	1	$167.40	
20090416	1160999007807021800	1	$167.40	
20090418	1160999009537099800	1	$104.85	
20090419	1160999009536935500	1	$170.01	
20090421	1160999007807962700	1	$440.76	
20090430	1160999009537456500	1	$113.34	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20090504	1160999007808021600	1	$181.02	
20090506	1160999009537428700	1	$170.01	
20090507	1160999007807910700	1	$407.75	
20090509	1160999009536908000	1	$334.00	
20090512	1160999009537429300	1	$245.56	
20090513	1160999007807022800	1	$170.01	
20090515	1160999009537027600	1	$186.00	
20090516	1160999007807752700	1	$111.60	
20090516	1160999009537013800	1	$401.93	
20090523	1160999009536885800	1	$113.34	
20090528	1160999007807395100	1	$113.34	
20090530	1160999009537429900	1	$188.90	
20090531	1160999009537396300	1	$186.00	
20090604	1160999009536900200	1	$188.90	
20090606	1160999007807395200	1	$407.75	
20090612	1160999007808572500	1	$186.00	
20090612	1160999009536898200	1	$167.40	
20090613	1160999007807308000	1	$303.80	
20090620	1160999001797603A00	1	$111.60	
20090620	1160999001797677A00	1	$113.34	
20090624	1160999007805827500	1	$113.34	
20090624	1160999007805827600	1	$113.34	
20090630	1160999001797478A00	1	$111.60	
20090630	1160999007804797200	1	$111.60	
20090630	1160999007804797300	1	$186.00	
20090630	1160999001797626A00	1	$188.90	
20090703	1160999001797376A00	1	$400.76	
20090708	1160999001798558A00	1	$226.67	
20090709	116099909016200	1	$182.55	
20090717	1160999001796690A00	1	$188.90	
20090719	1160999001802177A00	1	$186.00	
20090719	1160999001802082A00	1	$209.70	
20090719	1160999001796813A00	1	$113.34	
20090725	1160999001801527A00	1	$148.80	
20090725	1160999001797229A00	1	$113.34	
20090725	1160999001798517A00	1	$174.75	
20090727	1160999001797633A00	1	$226.67	
20090729	1160999001796976A00	1	$111.60	
20090802	1160999001797532A00	1	$186.00	
20090803	1160999001796930A00	1	$157.28	
20090803	1160999001796985A00	1	$167.40	
20090808	1160999001801529A00	1	$148.80	
20090810	1160999001798482A00	1	$311.24	
20090813	1160999001796883A00	1	$188.90	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20090813	1160999001796882A00	1	$188.90	
20090814	1160999001797294A00	1	$186.00	
20090815	1160999001797507A00	1	$111.60	
20090815	1160999001797895A00	1	$188.90	
20090815	1160999001798370A00	1	$113.34	
20090824	1160999001800528A00	1	$453.35	
20090825	1160999001800884A00	1	$170.01	
20090829	1160999001798431A00	1	$113.34	
20090831	1160999001797306A00	1	$188.90	
20090831	1160999001797305A00	1	$174.75	
20090902	1160999001797155A00	1	$104.85	
20090904	1160999001796890A00	1	$125.00	
20090905	1160999001800866A00	1	$167.40	
20090905	1160999001797114A00	1	$97.60	
20090907	1160999001800655A00	1	$148.80	
20090912	1160999001798601A00	1	$384.45	
20090918	1160999001801076A00	1	$113.34	
20090926	1160999001798384A00	1	$113.34	
20091003	1160999001797648A00	1	$188.90	
20091009	1160999001797542A00	1	$186.00	
20091030	1160999001800077A00	1	$188.90	
20091106	1160999001797328A00	1	$111.60	
20091122	1160999001800541A00	1	$113.34	
20091130	116099910000200	1	$327.42	
20091202	116099910002800	1	$54.14	
20091205	1160999001799539A00	1	$476.02	
20091205	1160999001799538A00	1	$476.02	
20091210	1160999001801702A00	1	$322.40	
20100101	1160999001799762A00	1	$111.60	
20100224	1160999001800449A00	1	$117.80	
20100227	1160999001801465A00	1	$113.34	
20100307	1160999001797339A00	1	$113.34	
20100321	116099910011900	1	$295.94	
20100324	1160999001799599A00	1	$151.12	
20100327	1160999001799618A00	1	$113.34	
20100403	1160999001796673A00	1	$113.34	
20100409	1160999001802113A00	1	$186.00	
20100411	1160999001796734A00	1	$113.34	
20100421	1160999002563103A00	1	$440.76	
20100421	1160999002563104A00	1	$440.76	
20100501	1160999001797340A00	1	$188.90	
20100506	1160999001802119A00	1	$226.67	
20100520	1160999002563106A00	1	$113.34	
20100522	1160999001796640A00	1	$99.03	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20100523	1160999001796738A00	1	$107.04	
20100523	1160999001801894A00	1	$188.90	
20100525	1160999002562515A00	1	$188.90	
20100525	1160999002562513A00	1	$113.34	
20100527	1160999001797412A00	1	$113.34	
20100527	1160999001797410A00	1	$113.34	
20100530	1160999001800482A00	1	$104.85	
20100530	1160999002563029A00	1	$113.34	
20100601	1160999001801475A00	1	$104.85	
20100612	1160999001800248A00	1	$113.34	
20100612	1160999002562853A00	1	$167.40	
20100612	1160999002562852A00	1	$434.00	
20100612	1160999002562854A00	1	$188.90	
20100613	1160999002562652A00	1	$113.34	
20100621	1160999002563138A00	1	$111.60	
20100624	1160999001800850A00	1	$99.03	
20100625	1160999002563139A00	1	$113.34	
20100626	1160999002562952A00	1	$113.34	
20100701	1160999001800250A00	1	$104.85	
20100704	1160999001800550A00	1	$111.60	
20100710	1160999002563251A00	1	$182.60	
20100715	1160999002563019A00	1	$113.34	
20100717	1160999001802162A00	1	$223.20	
20100721	1160999002563375A00	1	$167.40	
20100724	1160999001800485A00	1	$111.60	
20100731	1160999002563164A00	1	$111.60	
20100802	1160999002563271A00	1	$105.40	
20100802	1160999001802407A00	1	$226.67	
20100804	1160999002563322A00	1	$113.34	
20100804	1160999002563319A00	1	$174.22	
20100807	1160999001801915A00	1	$174.75	
20100809	1160999001801913A00	1	$174.75	
20100809	1160999001801914A00	1	$174.75	
20100814	1160999002565351A00	1	$111.60	
20100817	1160999002563024A00	1	$170.01	
20100817	1160999002563023A00	1	$440.76	
20100821	1160999001800421A00	1	$104.85	
20100827	1160999001801920A00	1	$254.20	
20100828	1160999001800369A00	1	$188.90	
20100828	1160999002562734A00	1	$135.00	
20100828	1160999001800368A00	1	$188.90	
20100902	1160999002565012A00	1	$111.60	
20100907	1160999002562793A00	1	$151.12	
20100923	1160999002565229A00	1	$104.85	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20100925	1160999002565433A00	1	$111.60	
20100929	1160999002564526A00	1	$113.34	
20100929	1160999002564527A00	1	$113.34	
20100930	1160999001800424A00	1	$174.75	
20101001	1160999002562991A00	1	$113.34	
20101001	1160999002562990A00	1	$107.04	
20101003	1160999001800496A00	1	$111.60	
20101011	1160999002565235A00	1	$206.21	
20101017	1160999002562945A00	1	$113.34	
20101020	1160999002565381A00	1	$113.34	
20101119	1160999002565093A00	1	$111.60	
20101126	1160999002565185A00	1	$170.01	
20101222	1160999002562916A00	1	$111.60	
20101223	1160999003254751A00	1	$90.00	
20110101	1160999002562918A00	1	$113.34	
20110120	1160999001564360Z00	1	$522.61	
20110301	1160999002564502A00	1	$111.60	
20110316	1160999003255232A00	1	$111.60	
20110317	1160999003254934A00	1	$188.90	
20110401	1160999003255578A00	1	$105.40	
20110401	1160999003255577A00	1	$99.03	
20110409	1160999003256022A00	1	$113.34	
20110415	1160999003256165A00	1	$113.34	
20110421	1160999003255110A00	1	$186.00	
20110421	1160999003255109A00	1	$186.00	
20110514	1160999002563656A00	1	$188.90	
20110515	1160999002562655A00	1	$113.34	
20110520	1160999003256380A00	1	$648.54	
20110528	1160999003255585A00	1	$186.00	
20110528	1160999003254704A00	1	$111.60	
20110607	1160999003256262A00	1	$111.60	
20110616	1160999003255587A00	1	$111.60	
20110618	1160999003255795A00	1	$113.34	
20110620	1160999003256267A00	1	$174.75	
20110620	1160999003256268A00	1	$186.00	
20110622	1160999003255854A00	1	$104.85	
20110625	1160999002563659A00	1	$188.90	
20110625	1160999002563658A00	1	$226.67	
20110625	1160999002563664A00	1	$328.60	
20110625	1160999002563663A00	1	$223.20	
20110625	1160999002563661A00	1	$186.00	
20110626	1160999002563666A00	1	$226.67	
20110626	1160999002563668A00	1	$209.70	
20110626	1160999003255478A00	1	$167.40	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20110628	116099903254566A00	1	$113.34	
20110701	1160999003255019A00	1	$174.75	
20110708	1160999002563851A00	1	$188.90	
20110709	1160999003254973A00	1	$174.75	
20110709	1160999003255711A00	1	$186.00	
20110712	1160999003256059A00	1	$113.34	
20110714	1160999003255721A00	1	$174.75	
20110714	1160999003255722A00	1	$111.60	
20110714	1160999003255149A00	1	$107.04	
20110714	1160999002563474A00	1	$8.80	
20110714	1160999003255720A00	1	$111.60	
20110716	1160999002563858A00	1	$258.16	
20110716	1160999003253752A00	1	$104.85	
20110716	1160999003253809A00	1	$113.34	
20110716	1160999003253980A00	1	$104.85	
20110717	1160999001801633A00	1	$327.42	
20110717	11609990018016934A00	1	$327.42	
20110719	1160999003254757A00	1	$111.60	
20110719	1160999003255590A00	1	$113.34	
20110728	1160999003256067A00	1	$104.85	
20110728	1160999002563859A00	1	$186.00	
20110802	1160999002564993A00	1	$111.60	
20110809	1160999003254708A00	1	$111.60	
20110824	1160999003256442A00	1	$111.60	
20110824	1160999001799745A00	1	$104.85	
20110825	1160999002565150A00	1	$111.60	
20110828	1160999003255062A00	1	$350.00	
20110903	1160999003255937A00	1	$251.86	
20110903	1160999002563822A00	1	$188.90	
20110903	1160999003255938A00	1	$251.86	
20110909	1160999003253995A00	1	$111.60	
20110910	1160999003254028A00	1	$113.34	
20110910	1160999003255025A00	1	$167.40	
20110910	1160999003255024A00	1	$167.40	
20110911	1160999003253537A00	1	$111.60	
20110922	1160999002563979A00	1	$223.20	
20110924	1160999003255069A00	1	$111.60	
20110924	1160999001801640A00	1	$322.40	
20111006	1160999003253919A00	1	$170.01	
20111007	1160999006610155A00	1	$113.34	
20111024	1160999006610278A00	1	$111.60	
20111024	1160999006610576A00	1	$186.00	
20111029	1160999002564999A00	1	$113.34	
20111031	1160999003255034A00	1	$104.85	

Fines Recommended for Write-Off

Offence Date	Offence Number	# of Counts	Total Owing	Comment
20111031	1160999006610326A00	1	$104.85	
20111031	1160999006610328A00	1	$111.60	
20111031	1160999006610329A00	1	$113.34	
20111111	1160999006610311A00	1	$440.76	
20111111	1160999006610310A00	1	$245.56	
20111112	1160999006610312A00	1	$434.00	
20111112	1160999006610313A00	1	$241.80	
20111130	1160999006610318A00	1	$151.12	
20111201	1160999006610140A00	1	$226.67	
20111201	1160999006610141A00	1	$409.27	
20111201	1160999006610139A00	1	$138.52	
20111201	1160999006610142A00	1	$157.41	
20111203	1160999006610378A00	1	$113.34	
20111231	1160999006610644A00	1	$111.60	
20111231	1160999006610645A00	1	$186.00	
200207404	1160999006500190500	1	$114.70	
201003619	1160999001800071A00	1	$113.34	
	Totals	1152	$238,561.73	

HALDIMAND COUNTY

Report LSS-13-2019 Road Closure and Conveyance of Part of Tuscarora Street and King William Street, Caledonia

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To advise Council of a request to close and convey part of Tuscarora Street and King William Street, Caledonia.

RECOMMENDATIONS:

1. THAT Report LSS-13-2019 Road Closure and Conveyance of Part of Tuscarora Street and King William Street, Caledonia be received;
2. AND THAT the application from James Hutton for the road closure and conveyance of PIN # 38155-0834(LT) Part of King William Street, Plan 51; Haldimand County and PIN # 38155-0139(LT) Tuscarora Street, Plan 51, between King William Street and Winniett Street, Haldimand County not be approved for the reasons outlined in Report LSS-13-2019.

Prepared by: Sandra Marsh, Property Coordinator

Reviewed by: Dana McLean, Supervisor, Risk Management & Legal Services

Respectfully submitted: Cathy Case, General Manager of Corporate & Social Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

The County has received a request to close and convey part of the road allowances known as Tuscarora Street and King William Street in Caledonia, together with the applicable road closure administration fee. Staff are recommending that the subject lands be retained by the municipality and not sold to the Applicant, in accordance with comments received from County divisions requiring the property to be retained for access purposes.

BACKGROUND:

In 2010, the County approved the closure and conveyance of portions of King William Street in Caledonia, which were deemed hazard land, to various surrounding property owners, including James Hutton. The portions of King William Street were added to the surrounding property owners' abutting lands. This closure and conveyance was authorized by Council through Report CS-SS-26-2013 on August 27, 2013. At the time that the portion of King William Street was conveyed to Mr. Hutton, he did not advise as to any intended use for the lands other than joining it to his existing property.

The County is now in receipt of another road closure request from Mr. Hutton to purchase part of the road allowances known as Tuscarora Street and a different portion of King William Street in Caledonia, which lands are identified in yellow on Attachment #1. The subject land, totaling approximately 0.28 acres, is an untraveled section of road that abuts the northerly boundary of Winniett Street, abuts the

southerly boundary of the Old Methodist Cemetery, and abuts the most easterly boundary of the lands owned by the Applicant, James Hutton, and municipally known as 34 Kincardine Street, Caledonia.

Staff have determined that the subject lands are currently used by the public and County staff to access and maintain the cemetery property, respectively, and should be retained for municipal purposes. Staff previously advised Mr. Hutton that it is appropriate that the lands be retained for municipal purposes, and in response, Mr. Hutton presented staff, consecutively, with several different options to consider for servicing and access through a portion of the subject road allowances. These options included purchasing the most westerly 16 feet of the subject road allowances, possibly purchasing a 20 foot strip in the middle of the subject road allowances and creating a shared gravel driveway to access the cemetery and Mr. Hutton's property. Possible servicing and access easement options were also discussed. The lands identified on Attachment #1 is the final option that Mr. Hutton has submitted for consideration.

ANALYSIS:

Mr. Hutton owns the abutting property, municipally known as 34 Kincardine Street, Caledonia which has road frontage on the east side of Kincardine Street. Mr. Hutton would like to develop the lands he currently owns, but has encountered restrictions regarding servicing and access to his property via Kincardine. The majority of his property is in the floodplain which would not support new development and only contains a small potential buildable area. Attachment #2 is a map provided by the Grand River Conservation Authority and identifies the area that that has possible development potential. Sanitary servicing is not possible by gravity from Kincardine Street to the Applicant's property. The GRCA would permit a secondary access lane from Kincardine to the building area (this may require a retaining wall or switch back due to the steep slope), but the GRCA has stated they could not support this as the only driveway access to the property, therefore Mr. Hutton is requesting to have the subject lands closed and conveyed to him to allow for development of a single residential unit, with access from Winniett.

In order to determine the feasibility of closure of the subject road, staff circulated a "Road Closure Inquiry Form" to Hydro One, Union Gas, Bell Canada, Rogers Cable, Grand River Conservation Authority and the following Haldimand County Divisions: Building & Municipal Enforcement Services, Community Development & Partnerships, Economic Development & Tourism, Emergency Services, Engineering Services, Environmental Operations, Facilities Capital & Asset Management, Facilities, Parks, Cemeteries & Forestry Operations, Planning & Development, Roads Operations and the Bereavement Authority of Ontario.

Hydro One, Rogers Cable and Bell Canada have advised that easements are required for existing infrastructure should Council approve the closure and sale request.

The Bereavement Authority of Ontario advised that the operator of a cemetery is not required to construct a paved road into a cemetery, however, must allow the public reasonable access to the cemetery. Closure and sale of the subject lands would leave the cemetery without legal access.

The County's Facilities Capital & Asset Management Division and the Facilities, Parks, Cemeteries & Forestry Operations Division confirmed a sale would land lock and restrict access to the cemetery for both the public and County staff. The cemetery is currently maintained by the County. The Divisions also noted that there is an established Canada Post super mailbox on the subject lands that services the surrounding area and would need to be relocated if the property were sold.

The Planning and Development Division provided comments, stating the County is obligated to maintain and provide access to a working cemetery; something that would be more difficult to achieve by the full or partial conveyance of the road allowance. They went on to say, the County's preference is that all development within urban boundaries be connected to full municipal services (water and

sanitary mains). The Official Plan does not allow complete private servicing within urban boundaries, however, does allow partial servicing in specific and unique cases. The Planning & Development Division is of the opinion that the provision of partial servicing may be possible by Mr. Hutton entering into an agreement with the County for an easement over the road allowance, still owned by the County. That said, Planning staff have concerns regarding the development ability of 34 Kincardine Street. The property Mr. Hutton currently owns, being 34 Kincardine Street, is designated as Floodway in the Official Plan, and zoned 'Hazard Land' in Zoning By-law 1-H 86. This is due to the possibility of flooding on the property, as well as concerns of slope stability in this location. The lands are also regulated by the Grand River Conservation Authority (GRCA) and any development would require review and approval by the GRCA, including all necessary permits. The Applicant would need to consult the relevant County Divisions to determine if there is a servicing approach that is acceptable to the Public Works Department.

As a result of the Planning comments, the option of providing an easement over Tuscarora to the Applicant's property was investigated further by staff, in particular the Environmental Services Division and the Engineering Services Division, to see if private servicing and a gravel driveway access could be extended along municipal road allowance. Providing an easement for private servicing in a road allowance for development of a single unit is not considered a best practice. Additionally, a private gravel driveway over an unopened municipal road, which is public property, is not something the County would consider. Several divisions could not support the Applicant's proposed approach. As a result, it was determined that the closure and conveyance of the road allowance cannot be supported, nor could an easement allowing private access or private infrastructure in the roadway.

In reviewing the road closure request, staff, in keeping with the County's past practice, notified all abutting property owners of the expression of interest received, and the possible closure and conveyance. Surrounding landowners (Maye, Carson and Fowler) have expressed concerns regarding the closure and sale of the subject land and oppose a sale to the Applicant.

For the reasons outlined in this report, staff do not recommend closure and conveyance of this unopened road allowance.

FINANCIAL/LEGAL IMPLICATIONS:

The non-refundable road closure administration fee in the amount of $1,151 has been received. When an application is made for a road closure and conveyance, the applicant is advised that the fee is non-refundable and that there is no guarantee their application will be supported. The administration fee is to recover some of the costs of the processes undertaken by staff to deal with the request for the road closure given that the benefit of such a transaction is primarily to the applicant.

STAKEHOLDER IMPACTS:

Planning & Development, Building & Municipal Enforcement Services, Engineering Services, Environmental Operations, Facilities Capital & Asset Management, Facilities, Parks, Cemeteries & Forestry Operations, Water & Wastewater Engineering & Compliance and the Grand River Conservation Authority have provided information for this report.

REPORT IMPACTS:

Agreement: Yes

By-law: Yes

Budget Amendment: No

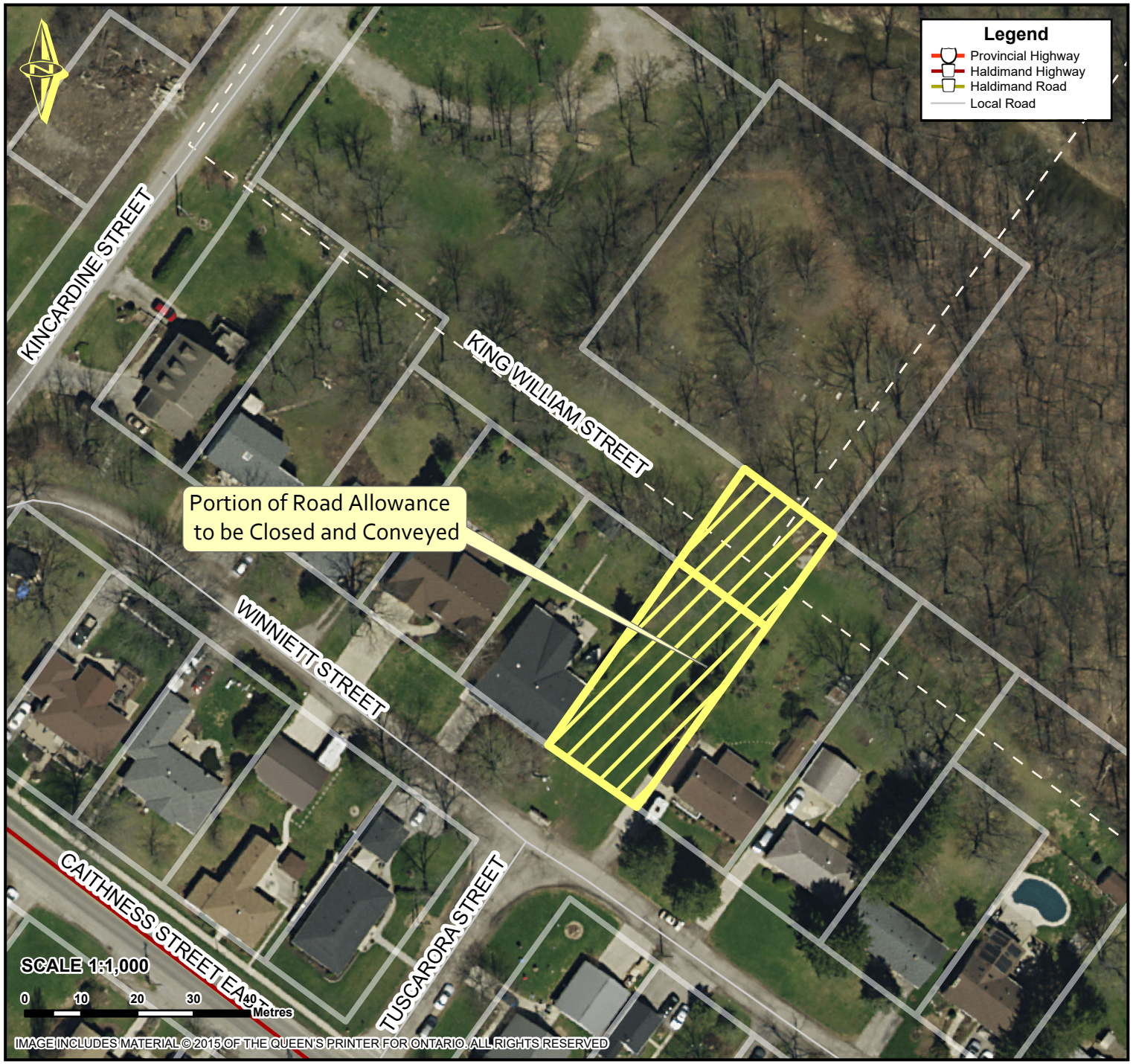
Policy: No

ATTACHMENTS:

1. Map of the Subject Lands
2. Potential Building Area

Road Closure and Conveyance of Part of Tuscarora Street & King William Street in Caledonia

LSS-13-2019, Attachment 1



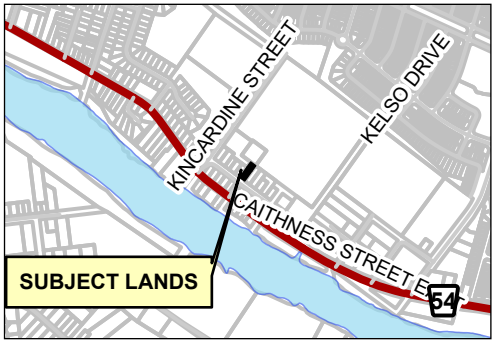
Location:

PART OF TUSCARORA STREET & KING WILLIAM STREET IN CALEDONIA

URBAN AREA OF CALEDONIA

WARD 3

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.



PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. May 2019

P:\REQUEST\GISTickets\Ticket2279\ROADCLOSURE.aprx

Grand River Conservation Authority
Date: Mar 29, 2019

34 Kincardine Street, Caledonia

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
  - Special Policy Area
- Slope Valley (GRCA)
  - Steep
  - Oversteep
  - Steep
- Slope Erosion (GRCA)
  - Oversteep
  - Toe
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)

This legend is static and may not fully reflect the layers shown on the map. The text of Ontario Regulation 150/06 supercedes the mapping as represented by these layers.

Copyright Grand River Conservation Authority, 2019.
Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to: https://maps.grandriver.ca/Sources-and-Citations.pdf

0 25 50 100 150 Metres

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Map Centre (UTM NAD83 z17): 586,638.19 4,769,003.86

This map is not to be used for navigation | 2015 Ortho (ON)

NAD 1983 UTM Zone 17N

Scale: 4,175

HALDIMAND NORFOLK HOUSING CORPORATION

May 29, 2019

Mayor Ken Hewitt and Councilors
Corporation of Haldimand County
45 Munsee Street North
PO Box 400
Cayuga, Ontario
N0A 1E0

Dear Mayor and Councillors:

Re: Shareholder Resolutions 2019-01 – Re-appointment of Board Members

Please find the attached resolution submitted for Haldimand County's consideration. Resolution 2019-01 requesting renewal terms for four of our current board members, Jeff Miller (Norfolk County), Brian Snyder (Haldimand County), Ken Lishman (Haldimand County), and Wayne Thomas (Norfolk County).

The Corporation of Haldimand County, as shareholder of the Haldimand Norfolk Housing Corporation, considers identical shareholder resolutions as the Corporation of Norfolk County.

Would you kindly review the attached Shareholder Resolution 2019-01, and if approved, please execute as required.

Please return an original copy of each document to our office for the corporate records of the Haldimand-Norfolk Housing Corporation.

If you have any questions regarding this matter, please contact Deborah Filice, CEO at 519-426-7792, Ext. 111.

Sincerely,

Jeff Miller, President
Haldimand Norfolk Housing Corporation

SHAREHOLDER RESOLUTION 2019-01

RESOLUTION OF THE SHAREHOLDER

of

HALDIMAND-NORFOLK HOUSING CORPORATION

WHEREAS, the Corporation of Haldimand County is a shareholder of the Haldimand-Norfolk Housing Corporation by way of a share certificate number 2 dated July 12th, 2001, for a total of 40 shares;

Be it resolved and approved by the Corporation of Haldimand County:

THAT Jeff Miller of Norfolk County be re-appointed to the Board of Directors of the Haldimand-Norfolk Housing Corporation effective June 1, 2019 for a term of three years, and;

THAT Brian Snyder of Haldimand County be re-appointed to the Board of Directors of the Haldimand-Norfolk Housing Corporation effective June 1, 2019 for a term of three years, and;

THAT Ken Lishman of Haldimand County be re-appointed to the Board of Directors of the Haldimand-Norfolk Housing Corporation effective June 1, 2019 for a term of three years, and;

THAT Wayne Thomas of Norfolk County be re-appointed to the Board of Directors of the Haldimand-Norfolk Housing Corporation effective June 1, 2019 for a term of three years.

Dated this day of , 2019 and approved by the shareholder of the Haldimand-Norfolk Housing Corporation.

The Corporation of Haldimand County
Per:

_____
Ken Hewitt, Mayor

_____
Evelyn Eichenbaum, Clerk

HALDIMAND COUNTY

Report LSS-18-2019 Unsolicited Offer from 2589200 Ontario Inc., Frank Marshall Business Park, Dunnville

For Consideration by Council in Committee on June 18, 2019

OBJECTIVE:

To provide details of an unsolicited offer to purchase vacant County-owned property in the Frank Marshall Business Park area in Dunnville.

RECOMMENDATIONS:

1. THAT Report LSS-18-2019 Unsolicited Offer from 2589200 Ontario Inc., Frank Marshall Business Park, Dunnville be received;
2. AND THAT Memorandum LSS-M12-2019 Additional Information Related to Report LSS-18-2019 be received as information and remain confidential;
3. AND THAT staff proceed with the direction provided by Council in closed session for the properties legally described as:
    - PIN # 38122-0371(LT), Block 2, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0372(LT), Block 3, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0382(LT), Jim Gregory Drive, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0373(LT), Block 4, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0374(LT), Block 5, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0375(LT), Block 6, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0376(LT), Block 7, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0377(LT), Block 8, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0378(LT), Block 9, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
    - PIN # 38122-0379(LT), Block 10, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733, together with an easement over Part Park Lots 6 and 8 Plan 69 and Part Lot 4 First Range from Grand River Parts 4, 5 & 6 on 18R-7006 as in CH45931; Haldimand County;

- PIN # 38122-0298(LT), Part Lot 7, Plan 720/1037, Parts 1–5 on 18R-2891 except Parts 1–8 on 18R-5939, S/T HC74121partially released by CH30143; Haldimand County;
- PIN # 38122-0297(LT), Part Lot 7, Plan 720/1037 as in HC232001; T/W HC232001; Haldimand County;

4. AND THAT the Mayor and Clerk be authorized to execute all necessary documents;
5. AND THAT a by-law be presented to authorize a sale, if applicable.

Prepared by: Sandra Marsh, Property Coordinator

Reviewed by: Dana McLean, Supervisor, Risk Management & Legal Services

Respectfully submitted: Cathy Case, General Manager of Corporate & Social Services

Approved: Donald G. Boyle, Chief Administrative Officer

EXECUTIVE SUMMARY:

An unsolicited offer to purchase several vacant County-owned parcels of land in the Frank Marshall Business Park area, which is situated along Ramsey Drive in Dunnville, has been received. Closed session Memorandum LSS-M12-2019 provides an analysis of the options available to Council.

BACKGROUND:

Staff have received an unsolicited offer, including the applicable fee, from 2589200 Ontario Inc. (Omar Aboya) to purchase vacant County-owned land in the Frank Marshall Business Park area in Dunnville. A location map of the subject property is shown as Attachment #1. The subject properties are zoned Highway Commercial (CH), General Industrial (MG), General Industrial – Holding (MG(H)) and Light Industrial (ML), and despite the approximation contained in Mr. Aboya's offer, a review of the Reference Plans indicate the properties represent a total of approximately 21.78 acres and are legally described as:

- PIN # 38122-0371(LT), Block 2, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0372(LT), Block 3, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0382(LT), Jim Gregory Drive, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0373(LT), Block 4, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0374(LT), Block 5, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0375(LT), Block 6, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0376(LT), Block 7, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0377(LT), Block 8, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;

- PIN # 38122-0378(LT), Block 9, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733; Haldimand County;
- PIN # 38122-0379(LT), Block 10, Plan 18M41, together with an easement over Part 4 on 18R-6834 as in HC169733, together with an easement over Part Park Lots 6 and 8 Plan 69 and Part Lot 4 First Range from Grand River Parts 4, 5 & 6 on 18R-7006 as in CH45931; Haldimand County;
- PIN # 38122-0298(LT), Part Lot 7, Plan 720/1037, Parts 1–5 on 18R-2891 except Parts 1–8 on 18R-5939, S/T HC74121 partially released by CH30143; Haldimand County;
- PIN # 38122-0297(LT), Part Lot 7, Plan 720/1037 as in HC232001; T/W HC232001; Haldimand County.

If the sale is approved by Council, Mr. Aboya has advised staff that he intends to develop the property as identified on the sketch submitted with his offer, which is provided as Attachment #2. This future development will be used for several different levels of mature lifestyle living and a community indoor pool in conjunction with the neighbouring community assets (Dunnville Memorial Arena and Community Lifespan Centre).

The offer submitted contains several conditions which are briefly outlined below:

- Conditional on the County taking back a first mortgage in the amount of $1,397,000 for 3 years at 0% interest;
- Conditional until July 5, 2019 on the Buyer, at his own expense, being satisfied as to:
    - environmental conditions of the land;
    - lands do not contain a habitat or critical habitat as defined in the *Endangered Species Act:*
    - no portion of the lands have been designated hazard land, flood plain or an environmentally protected zone;
    - rezoning of the property for the Buyer's specified use is permitted;
    - lands have no issues in regards to indigenous treaty lands in regards to all aspects with archeological or cultural claims and findings.

The offer contains a warranty clause regarding the environmental condition of the lands, which is not consistent with the County's past practice. The County's standard practice is to sell all property on an "as is/where is" basis and the Buyer signs an acknowledgement confirming this. If a counter offer is authorized by Council, it will need to include the insertion of the County's standard Environmental Acknowledgement.

The current offer also contains several usual acknowledgements by the Buyer and the County, specific details of which are outlined in Schedule A of the offer, which is included as Attachment #2.

The County is already under contract to sell one of the subject parcels of land, which is identified as Parcel 8 on Attachment #1, therefore this property cannot be dealt with. If Council wishes to consider Mr. Aboya's offer, Parcel 8 must be removed from the Agreement of Purchase and Sale, prior to acceptance or making a counter offer.

ANALYSIS:

When an unsolicited offer to purchase County property is received, staff are required to bring the offer forward in open session for Council's consideration. In order to determine the feasibility of the sale of this property, staff contacted all County Divisions to determine if there is a municipal need for the lands, in whole or in part, or if there are certain restrictions or provisions that should be placed on the sale.

Comments received indicated that Council has not officially approved a change to the land use designation of the Frank Marshall Business Park lands that would allow the proposed development. Comments furthermore stated that acceptance of this offer would be premature until such time as the Haldimand County Growth Strategy and Official Plan Review is completed, allowing for a competitive sale process to be undertaken so the County may maximize the property's potential and the benefit to the community.

The following staff comments were received:

Planning and Development

The subject properties are located in the Frank Marshall Business Park (FMBP), and are identified as core employment (industrial) lands within the County's Official Plan (OP). The proposal put forward as part of the unsolicited offer is not supported within the current land use designation. As part of the preliminary County growth strategy, the FMBP lands have been identified as candidate for a designation change to allow for mixed and/or residential use. However, that process must be dealt with as part of the County's Municipal Comprehensive Review (Official Plan update). More specifically, under current Provincial planning rules the change in designation needs to be considered as part of an overall evaluation of the employment land supply relative to need over a 20 year term. Council should first of all approve the employment land budget and secondly any change in land use designation for these lands through the necessary Official Plan update process. Based on this, and the fact that Council has not officially approved the changing of the designation of the FMBP lands, acceptance of this offer would be premature.

Facilities Capital & Asset Management:

The existing storm water management system is near capacity. New development requires re-engineering and verification of the existing storm water management system.

Parcel 9 contains underground utilities.

Proposed development of Parcels 1 and 2 will limit future expansion of the arena facility.

The proposed development may also present incompatible uses with the truck route which services the Memorial Arena, Lifespan Centre and existing businesses on Ramsey Drive.

Community Development and Partnerships & Economic Development & Tourism Divisions:

Agree with the above noted comments of the Planning and Development Division.

Engineering Services:

The storm water management pond identified as Parcel 10 is at capacity and will require expansion to accommodate future development.

Water & Wastewater Engineering & Compliance:

The subject properties appear to have services, but they are large services designed for non-residential development (150mm water, unclear as to sanitary). Existing services may need to be removed and replaced based on property use to adhere to the Water By-law and design criteria requirements.

Corporate & Social Services:

Council may wish to consider the housing shortage in the community, and throughout Ontario, when reviewing this proposal, and the positive impact this may have for the community.

Council may also wish to consider the Province wide shortage of Personal Support Workers and what impact this may have on the ability to recruit staff for an additional long term care facility, as well as the impact it may have on other long term care facilities in the community and surrounding area.

Mr. Aboya has paid the $690 administration fee and submitted his offer for the subject properties. The offer is in the amount of $1,497,000 and contains several conditions, details of which are summarized above in this Report.

Staff have reviewed the offer and have prepared confidential Memorandum LSS-M12-2019, which provides additional information regarding options for the disposal of this property, for discussion during the Closed Session of the Council in Committee meeting of June 18, 2019. Staff will then proceed in accordance with Council's direction.

A recommendation declaring the property surplus will be required should Council decide to sell it.

FINANCIAL/LEGAL IMPLICATIONS:

The County will be responsible for its title searching costs, which are estimated at approximately $350.

If the properties are declared as surplus and sold, net revenue generated from the sale of the property would be placed in the Industrial Land Sales Reserve.

The County is currently under contract for one of the subject parcels of land, therefore that particular parcel cannot be dealt with.

If sold, the property would generate property tax revenue and would no longer be the responsibility or liability of the County.

STAKEHOLDER IMPACTS:

Planning and Development, Economic Development & Tourism, Facilities Capital & Asset Management, Engineering Services, Water & Wastewater Engineering & Compliance, Corporate & Social Services and Community Development & Partnerships staff have provided information for this report.

REPORT IMPACTS:

Agreement: Yes

By-law: Yes

Budget Amendment: No

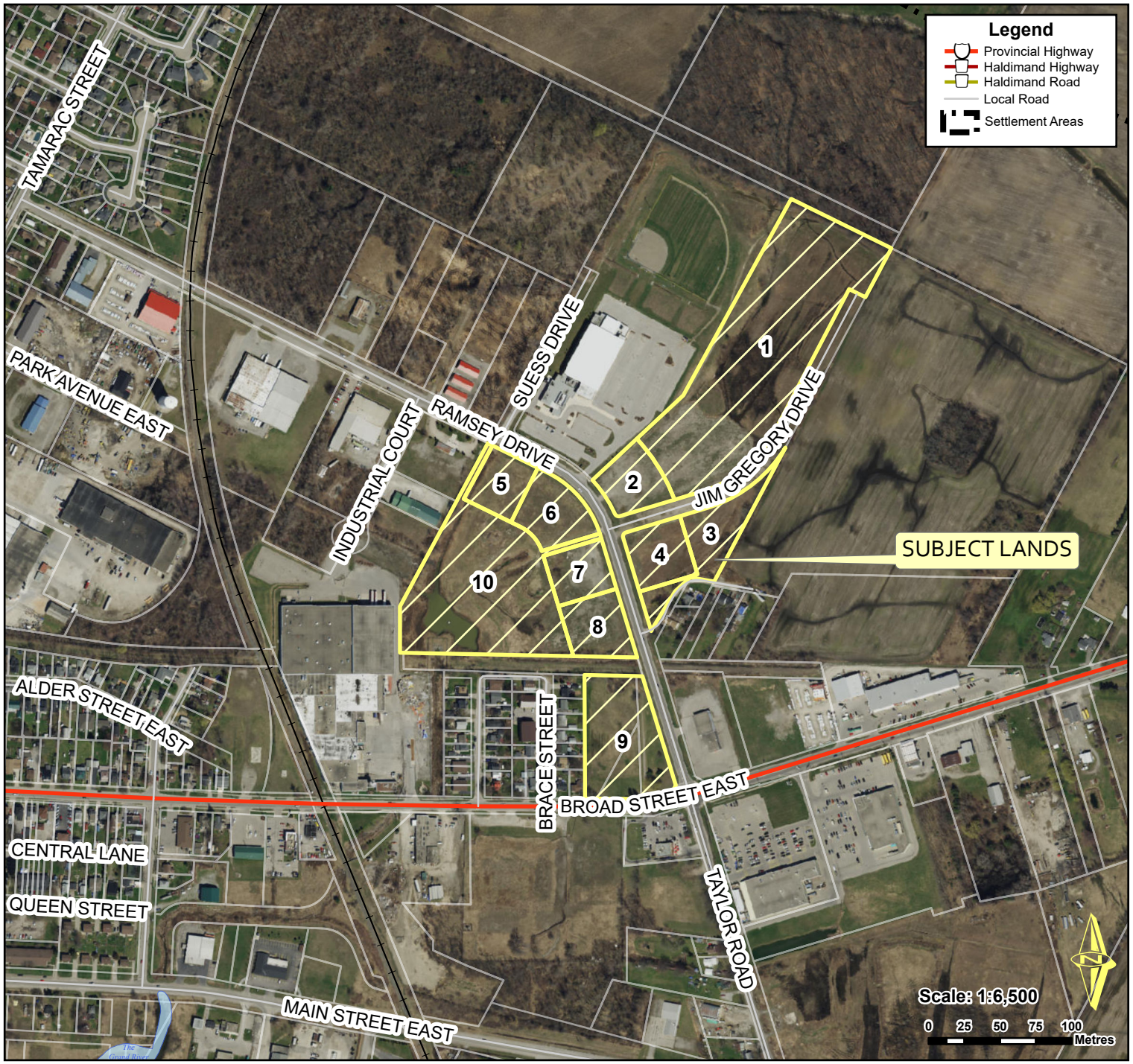
Policy: No

ATTACHMENTS:

1. Map of the Subject Lands
2. Offer from 2589200 Ontario Inc.

Location Map: Offer From 2589200 Ontario Inc.

LSS-18-2019, Attachment 1



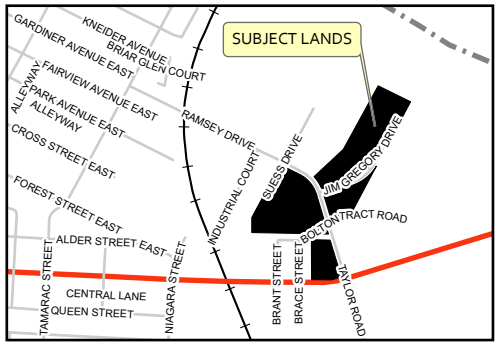
Location:

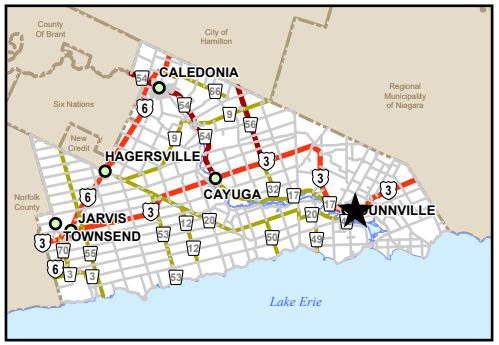
URBAN AREA OF DUNNVILLE
WARD 2

Property Assessment Numbers:

2810 024 005 33150 0000
2810 024 005 33175 0000
2810 024 005 33195 0000
2810 024 005 33185 0000
2810 024 005 33240 0000
2810 024 005 33230 0000
2810 024 005 33220 0000
2810 024 005 33210 0000
2810 024 001 12100 0000
2810 023 002 02800 0000
2810 023 002 03000 0000
2810 024 005 33250 0000

HALDIMAND COUNTY, IT'S EMPLOYEES, OFFICERS AND AGENTS ARE NOT RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INACCURACIES WHETHER DUE TO THEIR OWN NEGLIGENCE OR OTHERWISE. DO NOT USE FOR OPERATING MAP OR DESIGN PURPOSES. ALL INFORMATION TO BE VERIFIED.





PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT,
GIS & GRAPHICS SECTION. Jun 2019

P:\REQUEST\GISTickets\Ticket2414\LocationMap\LocationMap.aprx

OREA Ontario Real Estate Association

Agreement of Purchase and Sale

Form 100
for use in the Province of Ontario

LSS-18-2019, Attachment 2

This Agreement of Purchase and Sale dated this 13 day of May 20 19

BUYER: 2589200 ONTARIO INC., agrees to purchase from
(Full legal names of all Buyers)

SELLER: THE CORPORATION OF HALDIMAND COUNTY, the following
(Full legal names of all Sellers)

REAL PROPERTY:

Address FRANK A.MARSHALL BUSINESS PARK (to be fully described on Schedule A

fronting on the all legal descriptions on SCHEDULE A side of

in the COUNTY OF HALDIMAND

and having a frontage of 29.94 acres approximately more or less by a depth of more or less

and legally described as SEE SCHEDULE A

(the "property")
(Legal description of land including easements not described elsewhere)

PURCHASE PRICE: Dollars (CDN$) 1,497,000.00

One Million Four Hundred Ninety-Seven Thousand Dollars

DEPOSIT: Buyer submits Upon acceptance
(Herewith/Upon Acceptance/as otherwise described in this Agreement)

One Hundred Thousand Dollars (CDN$) 100,000.00

by negotiable cheque payable to THE CORPORATION OF HALDIMAND COUNTY "Deposit Holder" to be held in trust pending completion or other termination of this Agreement and to be credited toward the Purchase Price on completion. For the purposes of this Agreement, "Upon Acceptance" shall mean that the Buyer is required to deliver the deposit to the Deposit Holder within 24 hours of the acceptance of this Agreement. The parties to this Agreement hereby acknowledge that, unless otherwise provided for in this Agreement, the Deposit Holder shall place the deposit in trust in the Deposit Holder's non-interest bearing Real Estate Trust Account and no interest shall be earned, received or paid on the deposit.

Buyer agrees to pay the balance as more particularly set out in Schedule A attached.

SCHEDULE(S) A **attached hereto form(s) part of this Agreement.**

1. **IRREVOCABILITY:** This offer shall be irrevocable by Buyer (Seller/Buyer) until 11:59 p.m. (a.m./p.m.) on the 15 day of July 20 19, after which time, if not accepted, this offer shall be null and void and the deposit shall be returned to the Buyer in full without interest.

2. **COMPLETION DATE:** This Agreement shall be completed by no later than 6:00 p.m. on the 16 day of August 20 19. Upon completion, vacant possession of the property shall be given to the Buyer unless otherwise provided for in this Agreement.

INITIALS OF BUYER(S): DS OA **INITIALS OF SELLER(S):**

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3. **NOTICES:** The Seller hereby appoints the Listing Brokerage as agent for the Seller for the purpose of giving and receiving notices pursuant to this Agreement. Where a Brokerage (Buyer's Brokerage) has entered into a representation agreement with the Buyer, the Buyer hereby appoints the Buyer's Brokerage as agent for the purpose of giving and receiving notices pursuant to this Agreement. **Where a Brokerage represents both the Seller and the Buyer (multiple representation), the Brokerage shall not be appointed or authorized to be agent for either the Buyer or the Seller for the purpose of giving and receiving notices.** Any notice relating hereto or provided for herein shall be in writing. In addition to any provision contained herein and in any Schedule hereto, this offer, any counter-offer, notice of acceptance thereof or any notice to be given or received pursuant to this Agreement or any Schedule hereto (any of them, "Document") shall be deemed given and received when delivered personally or hand delivered to the Address for Service provided in the Acknowledgement below, or where a facsimile number or email address is provided herein, when transmitted electronically to that facsimile number or email address, respectively, in which case, the signature(s) of the party (parties) shall be deemed to be original.

FAX No.: ..... (For delivery of Documents to Seller)

FAX No.: ..... (For delivery of Documents to Buyer)

Email Address: ..... (For delivery of Documents to Seller)

Email Address: tomflatt@coldwellbanker.ca (For delivery of Documents to Buyer)

4. **CHATTELS INCLUDED:** None.

Unless otherwise stated in this Agreement or any Schedule hereto, Seller agrees to convey all fixtures and chattels included in the Purchase Price free from all liens, encumbrances or claims affecting the said fixtures and chattels.

5. **FIXTURES EXCLUDED:** None.

6. **RENTAL ITEMS (Including Lease, Lease to Own):** The following equipment is rented and **not** included in the Purchase Price. The Buyer agrees to assume the rental contract(s), if assumable:

None.

The Buyer agrees to co-operate and execute such documentation as may be required to facilitate such assumption.

7. **HST:** If the sale of the property (Real Property as described above) is subject to Harmonized Sales Tax (HST), then such tax shall be in addition to (included in/in addition to) the Purchase Price. If the sale of the property is not subject to HST, Seller agrees to certify on or before closing, that the sale of the property is not subject to HST. Any HST on chattels, if applicable, is not included in the Purchase Price.

INITIALS OF BUYER(S): DS OA

INITIALS OF SELLER(S):

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8. **TITLE SEARCH:** Buyer shall be allowed until 6:00 p.m. on the 1 day of August, 20 19, (Requisition Date) to examine the title to the property at Buyer's own expense and until the earlier of: (i) thirty days from the later of the Requisition Date or the date on which the conditions in this Agreement are fulfilled or otherwise waived or; (ii) five days prior to completion, to satisfy Buyer that there are no outstanding work orders or deficiency notices affecting the property, and that its present use (vacant land) may be lawfully continued and that the principal building may be insured against risk of fire. Seller hereby consents to the municipality or other governmental agencies releasing to Buyer details of all outstanding work orders and deficiency notices affecting the property, and Seller agrees to execute and deliver such further authorizations in this regard as Buyer may reasonably require.

9. **FUTURE USE:** Seller and Buyer agree that there is no representation or warranty of any kind that the future intended use of the property by Buyer is or will be lawful except as may be specifically provided for in this Agreement.

10. **TITLE:** Provided that the title to the property is good and free from all registered restrictions, charges, liens, and encumbrances except as otherwise specifically provided in this Agreement and save and except for (a) any registered restrictions or covenants that run with the land providing that such are complied with; (b) any registered municipal agreements and registered agreements with publicly regulated utilities providing such have been complied with, or security has been posted to ensure compliance and completion, as evidenced by a letter from the relevant municipality or regulated utility; (c) any minor easements for the supply of domestic utility or telecommunication services to the property or adjacent properties; and (d) any easements for drainage, storm or sanitary sewers, public utility lines, telecommunication lines, cable television lines or other services which do not materially affect the use of the property. If within the specified times referred to in paragraph 8 any valid objection to title or to any outstanding work order or deficiency notice, or to the fact the said present use may not lawfully be continued, or that the principal building may not be insured against risk of fire is made in writing to Seller and which Seller is unable or unwilling to remove, remedy or satisfy or obtain insurance save and except against risk of fire (Title Insurance) in favour of the Buyer and any mortgagee, (with all related costs at the expense of the Seller), and which Buyer will not waive, this Agreement notwithstanding any intermediate acts or negotiations in respect of such objections, shall be at an end and all monies paid shall be returned without interest or deduction and Seller, Listing Brokerage and Co-operating Brokerage shall not be liable for any costs or damages. Save as to any valid objection so made by such day and except for any objection going to the root of the title, Buyer shall be conclusively deemed to have accepted Seller's title to the property.

11. **CLOSING ARRANGEMENTS:** Where each of the Seller and Buyer retain a lawyer to complete the Agreement of Purchase and Sale of the property, and where the transaction will be completed by electronic registration pursuant to Part III of the Land Registration Reform Act, R.S.O. 1990, Chapter L4 and the Electronic Registration Act, S.O. 1991, Chapter 44, and any amendments thereto, the Seller and Buyer acknowledge and agree that the exchange of closing funds, non-registrable documents and other items (the "Requisite Deliveries") and the release thereof to the Seller and Buyer will (a) not occur at the same time as the registration of the transfer/deed (and any other documents intended to be registered in connection with the completion of this transaction) and (b) be subject to conditions whereby the lawyer(s) receiving any of the Requisite Deliveries will be required to hold same in trust and not release same except in accordance with the terms of a document registration agreement between the said lawyers. The Seller and Buyer irrevocably instruct the said lawyers to be bound by the document registration agreement which is recommended from time to time by the Law Society of Ontario. Unless otherwise agreed to by the lawyers, such exchange of Requisite Deliveries shall occur by the delivery of the Requisite Deliveries of each party to the office of the lawyer for the other party or such other location agreeable to both lawyers.

12. **DOCUMENTS AND DISCHARGE:** Buyer shall not call for the production of any title deed, abstract, survey or other evidence of title to the property except such as are in the possession or control of Seller. If requested by Buyer, Seller will deliver any sketch or survey of the property within Seller's control to Buyer as soon as possible and prior to the Requisition Date. If a discharge of any Charge/Mortgage held by a corporation incorporated pursuant to the Trust And Loan Companies Act (Canada), Chartered Bank, Trust Company, Credit Union, Caisse Populaire or Insurance Company and which is not to be assumed by Buyer on completion, is not available in registrable form on completion, Buyer agrees to accept Seller's lawyer's personal undertaking to obtain, out of the closing funds, a discharge in registrable form and to register same, or cause same to be registered, on title within a reasonable period of time after completion, provided that on or before completion Seller shall provide to Buyer a mortgage statement prepared by the mortgagee setting out the balance required to obtain the discharge, and, where a real-time electronic cleared funds transfer system is not being used, a direction executed by Seller directing payment to the mortgagee of the amount required to obtain the discharge out of the balance due on completion.

13. **INSPECTION:** Buyer acknowledges having had the opportunity to inspect the property and understands that upon acceptance of this offer there shall be a binding agreement of purchase and sale between Buyer and Seller. **The Buyer acknowledges having the opportunity to include a requirement for a property inspection report in this Agreement and agrees that except as may be specifically provided for in this Agreement, the Buyer will not be obtaining a property inspection or property inspection report regarding the property.**

14. **INSURANCE:** All buildings on the property and all other things being purchased shall be and remain until completion at the risk of Seller. Pending completion, Seller shall hold all insurance policies, if any, and the proceeds thereof in trust for the parties as their interests may appear and in the event of substantial damage, Buyer may either terminate this Agreement and have all monies paid returned without interest or deduction or else take the proceeds of any insurance and complete the purchase. No insurance shall be transferred on completion. If Seller is taking back a Charge/Mortgage, or Buyer is assuming a Charge/Mortgage, Buyer shall supply Seller with reasonable evidence of adequate insurance to protect Seller's or other mortgagee's interest on completion.

INITIALS OF BUYER(S): DS OA **INITIALS OF SELLER(S):**

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15. PLANNING ACT: This Agreement shall be effective to create an interest in the property only if Seller complies with the subdivision control provisions of the Planning Act by completion and Seller covenants to proceed diligently at Seller's expense to obtain any necessary consent by completion.

16. DOCUMENT PREPARATION: The Transfer/Deed shall, save for the Land Transfer Tax Affidavit, be prepared in registrable form at the expense of Seller, and any Charge/Mortgage to be given back by the Buyer to Seller at the expense of the Buyer. If requested by Buyer, Seller covenants that the Transfer/Deed to be delivered on completion shall contain the statements contemplated by Section 50(22) of the Planning Act, R.S.O.1990.

17. RESIDENCY: (a) Subject to (b) below, the Seller represents and warrants that the Seller is not and on completion will not be a non-resident under the non-residency provisions of the Income Tax Act which representation and warranty shall survive and not merge upon the completion of this transaction and the Seller shall deliver to the Buyer a statutory declaration that Seller is not then a non-resident of Canada; (b) provided that if the Seller is a non-resident under the non-residency provisions of the Income Tax Act, the Buyer shall be credited towards the Purchase Price with the amount, if any, necessary for Buyer to pay to the Minister of National Revenue to satisfy Buyer's liability in respect of tax payable by Seller under the non-residency provisions of the Income Tax Act by reason of this sale. Buyer shall not claim such credit if Seller delivers on completion the prescribed certificate.

18. ADJUSTMENTS: Any rents, mortgage interest, realty taxes including local improvement rates and unmetered public or private utility charges and unmetered cost of fuel, as applicable, shall be apportioned and allowed to the day of completion, the day of completion itself to be apportioned to Buyer.

19. PROPERTY ASSESSMENT: The Buyer and Seller hereby acknowledge that the Province of Ontario has implemented current value assessment and properties may be re-assessed on an annual basis. The Buyer and Seller agree that no claim will be made against the Buyer or Seller, or any Brokerage, Broker or Salesperson, for any changes in property tax as a result of a re-assessment of the property, save and except any property taxes that accrued prior to the completion of this transaction.

20. TIME LIMITS: Time shall in all respects be of the essence hereof provided that the time for doing or completing of any matter provided for herein may be extended or abridged by an agreement in writing signed by Seller and Buyer or by their respective lawyers who may be specifically authorized in that regard.

21. TENDER: Any tender of documents or money hereunder may be made upon Seller or Buyer or their respective lawyers on the day set for completion. Money shall be tendered with funds drawn on a lawyer's trust account in the form of a bank draft, certified cheque or wire transfer using the Large Value Transfer System.

22. FAMILY LAW ACT: Seller warrants that spousal consent is not necessary to this transaction under the provisions of the Family Law Act, R.S.O.1990 unless the spouse of the Seller has executed the consent hereinafter provided.

23. UFFI: Seller represents and warrants to Buyer that during the time Seller has owned the property, Seller has not caused any building on the property to be insulated with insulation containing ureaformaldehyde, and that to the best of Seller's knowledge no building on the property contains or has ever contained insulation that contains ureaformaldehyde. This warranty shall survive and not merge on the completion of this transaction, and if the building is part of a multiple unit building, this warranty shall only apply to that part of the building which is the subject of this transaction.

24. LEGAL, ACCOUNTING AND ENVIRONMENTAL ADVICE: The parties acknowledge that any information provided by the brokerage is not legal, tax or environmental advice.

25. CONSUMER REPORTS: The Buyer is hereby notified that a consumer report containing credit and/or personal information may be referred to in connection with this transaction.

26. AGREEMENT IN WRITING: If there is conflict or discrepancy between any provision added to this Agreement (including any Schedule attached hereto) and any provision in the standard pre-set portion hereof, the added provision shall supersede the standard pre-set provision to the extent of such conflict or discrepancy. This Agreement including any Schedule attached hereto, shall constitute the entire Agreement between Buyer and Seller. There is no representation, warranty, collateral agreement or condition, which affects this Agreement other than as expressed herein. For the purposes of this Agreement, Seller means vendor and Buyer means purchaser. This Agreement shall be read with all changes of gender or number required by the context.

27. TIME AND DATE: Any reference to a time and date in this Agreement shall mean the time and date where the property is located.

INITIALS OF BUYER(S): DS OA **INITIALS OF SELLER(S):**

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28. SUCCESSORS AND ASSIGNS: The heirs, executors, administrators, successors and assigns of the undersigned are bound by the terms herein.

SIGNED, SEALED AND DELIVERED in the presence of:

DocuSigned by: Cynthia Featherstone 4E5395AE53F1416...
(Witness)

(Witness)

IN WITNESS whereof I have hereunto set my hand and seal:

DocuSigned by: Omar Aboya 62235EA028C4434...
(Buyer) AUTHORIZED TO BIND CORP (Seal) (Date) 5/13/2019

(Buyer) (Seal) (Date)

I, the Undersigned Seller, agree to the above offer. I hereby irrevocably instruct my lawyer to pay directly to the brokerage(s) with whom I have agreed to pay commission, the unpaid balance of the commission together with applicable Harmonized Sales Tax (and any other taxes as may hereafter be applicable), from the proceeds of the sale prior to any payment to the undersigned on completion, as advised by the brokerage(s) to my lawyer.

SIGNED, SEALED AND DELIVERED in the presence of:

(Witness)

(Witness)

IN WITNESS whereof I have hereunto set my hand and seal:

(Seller) (Seal) (Date)

(Seller) (Seal) (Date)

SPOUSAL CONSENT: The undersigned spouse of the Seller hereby consents to the disposition evidenced herein pursuant to the provisions of the Family Law Act, R.S.O.1990, and hereby agrees to execute all necessary or incidental documents to give full force and effect to the sale evidenced herein.

(Witness) (Spouse) (Seal) (Date)

CONFIRMATION OF ACCEPTANCE: Notwithstanding anything contained herein to the contrary, I confirm this Agreement with all changes both typed and written was finally accepted by all parties at ..... (a.m./p.m.) this ..... day of....., 20.....

(Signature of Seller or Buyer)

INFORMATION ON BROKERAGE(S)

Listing Brokerage ..... (Tel.No.)

(Salesperson/Broker/Broker of Record Name)

Co-op/Buyer Brokerage Coldwell Banker Flatt Realty Inc. (905) 768-7717 (Tel.No.)

Thomas Flatt (Salesperson/Broker/Broker of Record Name)

ACKNOWLEDGEMENT

I acknowledge receipt of my signed copy of this accepted Agreement of Purchase and Sale and I authorize the Brokerage to forward a copy to my lawyer.

(Seller) (Date)

(Seller) (Date)

Address for Service .....

(Tel. No.)

Seller's Lawyer .....

Address .....

Email .....

(Tel. No.) (Fax. No.)

I acknowledge receipt of my signed copy of this accepted Agreement of Purchase and Sale and I authorize the Brokerage to forward a copy to my lawyer.

DocuSigned by: Omar Aboya 62235EA028C4434...
(Buyer) AUTHORIZED TO BIND CORP (Date) 5/13/2019

(Buyer) (Date)

Address for Service .....

(Tel. No.)

Buyer's Lawyer ~~BRIAN LUTZ~~ Ralph Benedict DS

Address 322 Argyle Street South, Caledonia

Email (905)765-4004 (905)765-3001

(Tel. No.) (Fax. No.)

FOR OFFICE USE ONLY

COMMISSION TRUST AGREEMENT

To: Co-operating Brokerage shown on the foregoing Agreement of Purchase and Sale:
In consideration for the Co-operating Brokerage procuring the foregoing Agreement of Purchase and Sale, I hereby declare that all moneys received or receivable by me in connection with the Transaction as contemplated in the MLS® Rules and Regulations of my Real Estate Board shall be receivable and held in trust. This agreement shall constitute a Commission Trust Agreement as defined in the MLS® Rules and shall be subject to and governed by the MLS® Rules pertaining to Commission Trust.

DATED as of the date and time of the acceptance of the foregoing Agreement of Purchase and Sale.

Acknowledged by DocuSigned by: Cynthia Featherstone 4E5395AE53F1416...

(Authorized to bind the Listing Brokerage) (Authorized to bind the Co-operating Brokerage)

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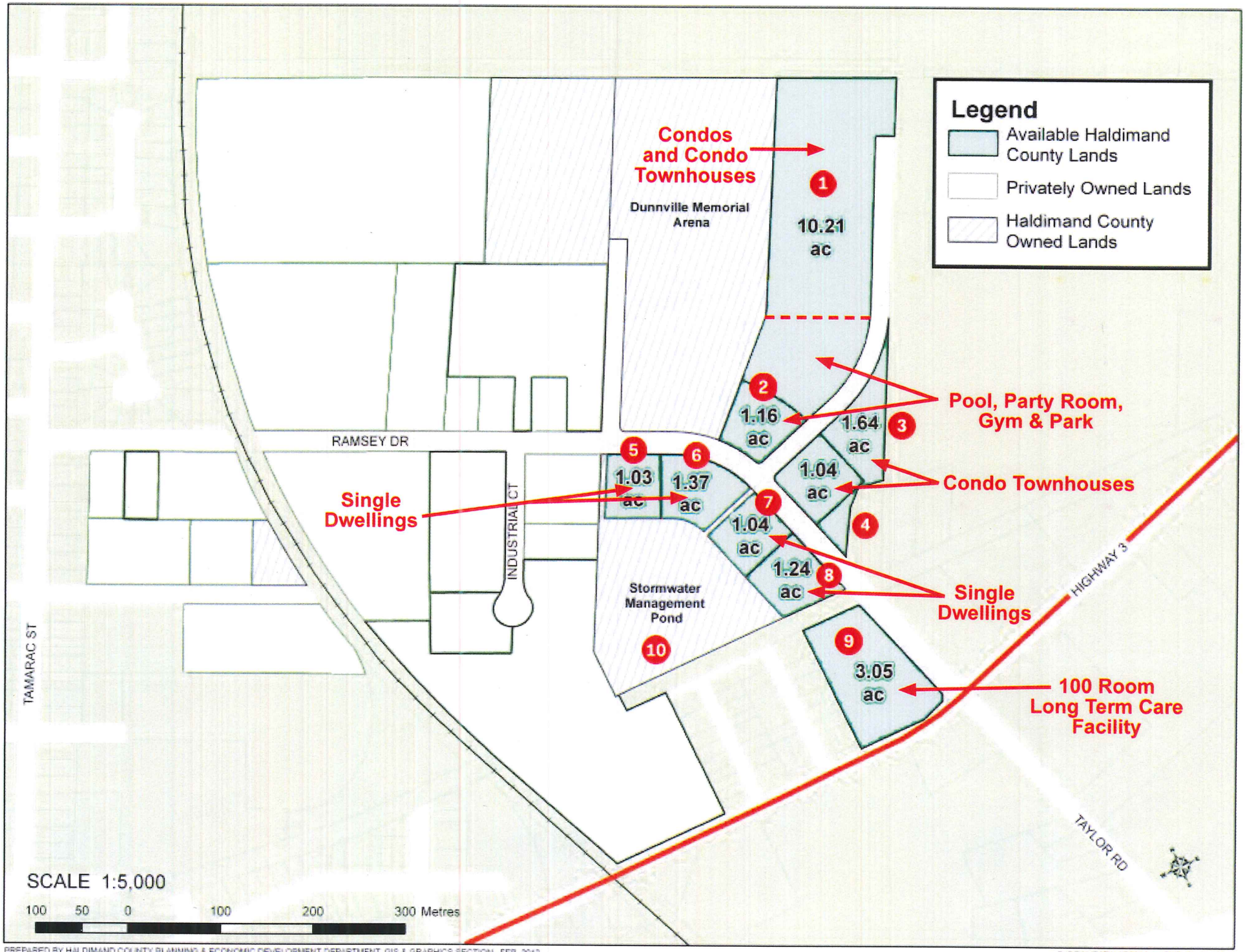
Legend
Available Haldimand County Lands
Privately Owned Lands
Haldimand County Owned Lands
Condos and Condo Townhouses
Dunnville Memorial Arena
1
10.21 ac
2
1.16 ac
3
1.64 ac
4
1.04 ac
Pool, Party Room, Gym & Park
Condo Townhouses
RAMSEY DR
5
1.03 ac
6
1.37 ac
7
1.04 ac
8
1.24 ac
Single Dwellings
INDUSTRIAL CT
Stormwater Management Pond
10
9
3.05 ac
Single Dwellings
100 Room Long Term Care Facility
HIGHWAY 3
TAYLOR RD
TAMARAC ST
SCALE 1:5,000
100 50 0 100 200 300 Metres
PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT GIS & GRAPHICS SECTION FEB. 2013
P:\REQUEST\HCP98\Maps\FMB_SignageMap

OREA Ontario Real Estate Association

Form 100
for use in the Province of Ontario

Schedule A
Agreement of Purchase and Sale

This Schedule is attached to and forms part of the Agreement of Purchase and Sale between:

BUYER: 2589200 ONTARIO INC., and

SELLER: THE CORPORATION OF HALDIMAND COUNTY

for the purchase and sale of FRANK A.MARSHALL BUSINESS PARK (to be fully descr HALDIMAND

dated the 13 day of May, 20 19

Buyer agrees to pay the balance as follows:

LEGAL DESCRIPTIONS;
BLOCK 2, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
BLOCK 3, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
JIM GREGORY DRIVE, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
BLOCK 4, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
BLOCK 5, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
BLOCK 6, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
BLOCK 7, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY,
BLOCK 8, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY
BLOCK 9, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 HALDIMAND COUNTY
BLOCK 10, PLAN 18M41 TOGETHER WITH AN EASEMENT OVER PT 4 18R6834 AS IN HC169733 TOGETHER WITH AN EASEMENT OVER PT PARK LTS 6 & 8 PL 69 & PT LT 4 1ST RANGE FROM GRAND RIVER PTS 4, 5 & 6 18R7006 AS IN CH45931 HALDIMAND COUNTY
PT LT 7 PL 720/1037 PT 1-5, 18R2891 EXCEPT PT 1-8, 18R5939; S/T HC74121 PARTIALLY RELEASED BY CH30143; HALDIMAND COUNTY,
PT LT 7 PL 720/1037 AS IN HC232001; T/W HC232001; HALDIMAND COUNTY.

The Seller agrees to take back a First Charge/Mortgage in the amount of ONE MILLION THREE HUNDRED NINTY-SEVEN THOUSAND DOLLARS ($ 1,397,000.00), bearing interest at the rate of 0% per annum, calculated semi-annually not in advance, with no payments towards principal, and to run for a term of three years from the date of completion of this transaction.

This form must be initialed by all parties to the Agreement of Purchase and Sale.

INITIALS OF BUYER(S): DS OA

INITIALS OF SELLER(S):

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OREA Ontario Real Estate Association

Form 100
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Schedule A
Agreement of Purchase and Sale

This Schedule is attached to and forms part of the Agreement of Purchase and Sale between:

BUYER: 2589200 ONTARIO INC., and

SELLER: THE CORPORATION OF HALDIMAND COUNTY

for the purchase and sale of FRANK A.MARSHALL BUSINESS PARK (to be fully descr HALDIMAND

dated the 13 day of May, 20 19

The Buying Corporation principal owner is Omar Aboya and the Buying Corporation intends to use the lands for several different levels of mature life style living and Community indoor pool in conjunction with the neighbouring Community assets (Memorial Arena and Lifespan Centre).

This Offer is conditional upon the Buyer determining, at the Buyer's own expense;
1- that all environmentallaws and regulations have been complied with, no hazardous conditions or substances exist on the land, no limitations or restrictions affecting the continued use of the property exist, other than those specifically provided for herein, no pending litigation respecting Environmental matters, no outstanding Ministry of Environment Orders, investigation, charges or prosecutions respecting Environmental matters exist, there has been no prior use as a waste disposal site, and all applicable licences are in force,
2- that the property does not contain a habitat or critical habitat as defined in the Species at Risk Act, SC 2002, C29, nor a habitat as defined in the Endangered Species Act, 2007 S.O. 2007, C6,
3- that no portion of the property has been designated as hazard land, flood plain, or an environmentally protected zone and
4- that the property can be zoned in final and binding form under the relevant zoning bylaws and official plan to permit it to develop or use the property for the purpose's specific to the Buyer's needs at the Buyer's sole and absolute discretion in regards suitable to the Buyer. The Seller agrees to provide to the Buyer upon request, all documents, records, and reports relating to environmental matters or permits or infrastructure details in possession of the Seller. The Seller further authorizes any associated authority in any matter, to release to the Buyer, the Buyer's Representative or Solicitor, any and all information that may be on record in the Ministry office with respect to the said property and
5-the Buyer determining, at the Buyer's own expense, that there is no issues in regards to Indigenous treaty lands in regards to all aspects with Archaelogical or Cultural claims and findings at the Buyer's sole and absolute discretion.
Unless the Buyer gives notice in writing delivered to the Seller personally or in accordance with any other provisions for the delivery of notice in this Agreement of Purchase and Sale or any Schedule thereto not later than 11:59p.m. on the 5th day of July, 2019, that the preceding conditions have been fulfilled, this Offer shall become null and void. These conditions are included for the benefit of the Buyer and may be waived at the Buyer's sole option by notice in writing to the Seller as aforesaid within the time period stated herein.

This form must be initialed by all parties to the Agreement of Purchase and Sale.

INITIALS OF BUYER(S): DS OA

INITIALS OF SELLER(S):

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OREA Ontario Real Estate Association

Form 100
for use in the Province of Ontario

Schedule A
Agreement of Purchase and Sale

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BUYER: 2589200 ONTARIO INC., and

SELLER: THE CORPORATION OF HALDIMAND COUNTY

for the purchase and sale of FRANK A.MARSHALL BUSINESS PARK (to be fully descr HALDIMAND

dated the 13 day of May, 20 19

The Buyer acknowledges that the property lies within, partially within, adjacent to or within two kilometres of an area zoned, used or identified for agricultural and food production activities and that such activities occur in the area. These activities may include intensive operations that cause discomfort and inconveniences that involve, but not limited to dust, noise, flies, light, odour, smoke, traffic, vibration, operating of machinery during any 24 hour period, storage and utilization of manure and the application by spraying or otherwise of chemical fertilizers, soil amendments, herbicides and pesticides. One or more of these inconveniences have protection in Ontario under the Farming and Food Production Protection Act.

The Buyer acknowledges that they are taking the property, 'as is, where is upon completion' and have made and been given the opportunity to investigate all aspects regarding the property within a conditional period.
Further, the Seller will allow the Buyer, or Buyer's Representatives, access to the property for the purpose of any necessary work in regards to fulfilling any conditions which would include, but not be limited to; survey work, sampling, testing.

The Seller authorizes the any associated authority, to release to the Buyer, or the Buyer's Representative or Solicitor, any and all information that may be on record in the Ministry's office(s) with respect to the said property.

The Seller represents and warrants to the best of the Seller's knowledge and belief that during the period of his ownership of the property, that all environmental laws and regulations have been complied with, no hazardous conditions or substances exist on the land, no limitations or restrictions affecting the continued use of the property exist, other than those specifically provided for herein, no pending litigation respecting Environmental matters, no outstanding Ministry of Environment Orders, investigations, charges or prosecutions regarding Environmental matters exist, there has been no prior use as a waste disposal site, and all applicable licences are in force. The Seller agrees to provide to the Buyer upon request, all documents, records, and reports relating to environmental matters that are in the possession of the Seller. The Seller further authorizes any authorized authority, to release to the Buyer, the Buyer's Agent or Solicitor, any and all information that may be on record in the Ministry office(s) with respect to the said property. The Parties agree that this representation and warranty shall form an integral part of this Agreement and survive the completion of this transaction, but apply only to circumstances existing at completion of this transaction.

This form must be initialed by all parties to the Agreement of Purchase and Sale.

INITIALS OF BUYER(S): DS

INITIALS OF SELLER(S):

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OREA Ontario Real Estate Association

Form 100
for use in the Province of Ontario

Schedule A
Agreement of Purchase and Sale

This Schedule is attached to and forms part of the Agreement of Purchase and Sale between:

BUYER: 2589200 ONTARIO INC., and

SELLER: THE CORPORATION OF HALDIMAND COUNTY

for the purchase and sale of FRANK A.MARSHALL BUSINESS PARK (to be fully descr HALDIMAND

dated the 13 day of May, 2019

The Buyer acknowledges that he will be responsible for property servicing which includes and is not limited to; sewer, water, hydro, gas and telecommunications, at the Buyer's expense.

The Buyer and Seller acknowledge that Seller will not be making any HST remittance or reporting and that the Buyer will remit or report the applicable HST at the Buyer's convenience.

The Buyer(s) are responsible for their own investigation of the lands, permitted uses, etc. Haldimand County does not make any representation or warranty whatsoever of the fitness or condition of the property(ies) nor with respect to any fixtures, chattels, on the property(ies). Property(ies) will be sold by Haldimand County on an "as is/where is" basis without regard for environmental issues, state of repair, location of structures or fences, and the Buyer(s) agree to sign a waiver confirming this. The property(ies) will remain subject to any judicial, municipal or any other governmental bylaws, agreements, restrictions or orders affecting or regarding its condition or use, including deficiency or any other work orders.

The Buyer(s) has relied solely on their own inspection of the property(ies) and that of their advisors, if applicable. This includes, but is not limited to, the fair market value of the lands, survey of the lands, site inspections and requirements related to use of the property. The Buyer(s) has not relied on any description of the property provided by Haldimand County.

The Buyer(s) agrees that, upon an Offer becoming firm, and prior to the required by-law(s) being passed by Council authorizing the sale, that the County will be required to notify the public of the sale(s) including, but not limited to, the name of the buyer(s) and the sale price.

This form must be initialed by all parties to the Agreement of Purchase and Sale.

INITIALS OF BUYER(S): DS OA

INITIALS OF SELLER(S):

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From: Omar Aboya
Sent: Thursday, June 13, 2019 9:07 AM
To: Evelyn Eichenbaum <eeichenbaum@haldimandcounty.on.ca>
Cc: Sandra Marsh <smarsh@haldimandcounty.on.ca>
Subject: Presentation to Council on Tuesday, June 18, 2019 for Frank Marshall Park....

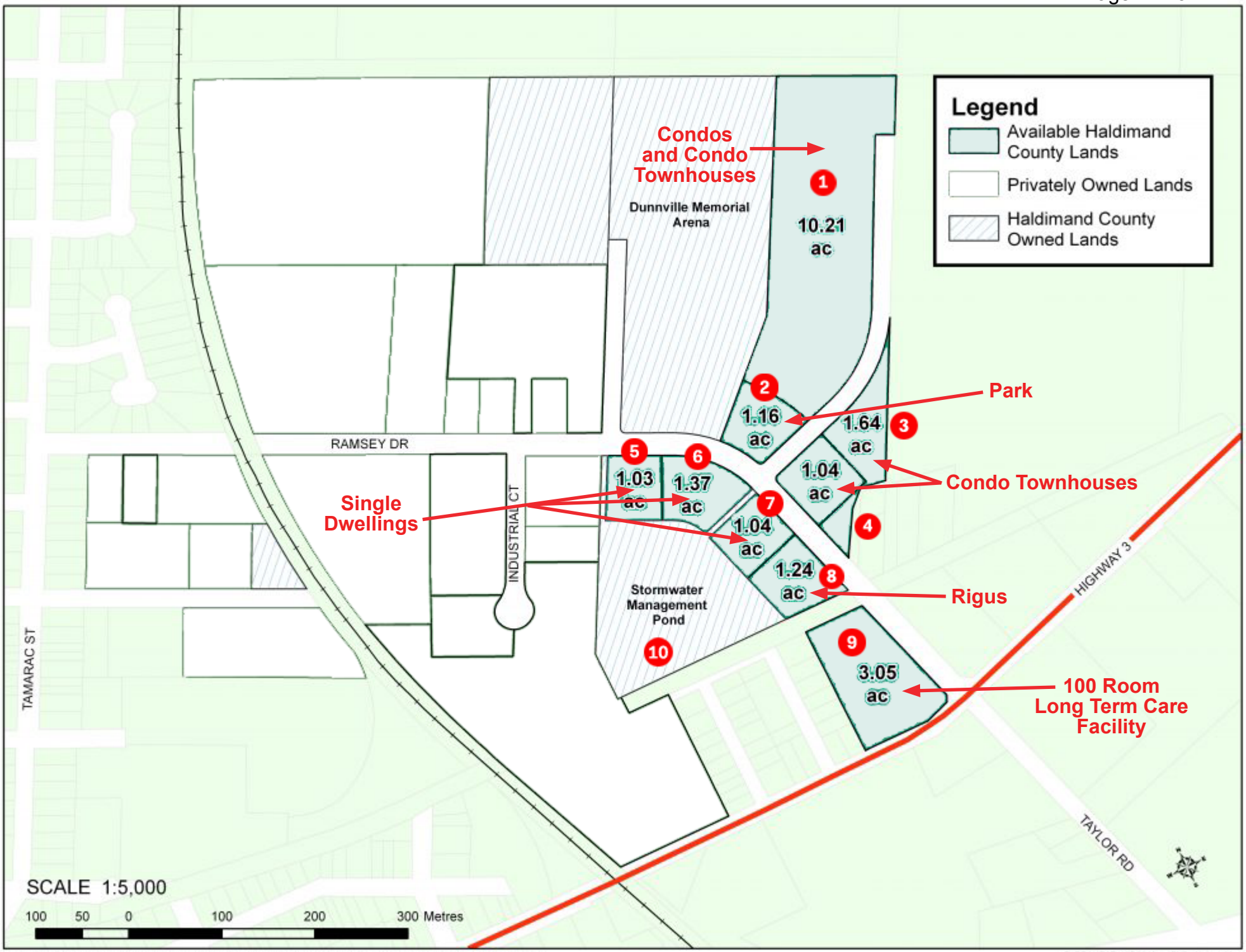
Good Morning Evelyn,

Confirming that I will be presenting my proposal to council on Tuesday, June 18, 2019 for the county owned lands at Frank Marshall Park on Ramsey Drive, Dunnville.

I have attached an image showing what I am planning.

I will have a layout done by my civil engineers by Monday. Couple of days ago four single mothers informed me that they can't even afford to buy a 325,000 home (which was my plan), now I have to design 250,000 dollar homes. Starters also want cheaper than 325,000.

Thanks. Omar.



PREPARED BY HALDIMAND COUNTY PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT, GIS & GRAPHICS SECTION. FEB. 2013.

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HALDIMAND COUNTY

POLICE SERVICES BOARD MINUTES

Date: **April 24, 2019**
Time: **9:30 A.M.**
Location: **Community Boardroom, OPP Detachment, Cayuga**

MEMBERS PRESENT B. Corbett, Chair
B. Haggith, Vice Chair
K. Boon, Member
D. Lawrence, Member

STAFF PRESENT Inspector Carter, Haldimand County O.P.P.
C. Manley, General Manager, Community & Development Services, Haldimand County
T. Cassidy, Police Services Board Administrator

A. CALL TO ORDER

The Chair called the Police Services Board meeting to order at 9:32 a.m.

B. SWEARING IN OF NEW MEMBER

K. Boon swore his Oath of Office before the Board Administrator.

C. DISCLOSURES OF PECUNIARY INTEREST

None.

D. ADDITIONS TO THE AGENDA

1 Discussion Re: Speeding on Claymore Crescent, Caledonia

2 Update Re: Enforcement at Parks over the Summer Months

3 Update Re: Withdrawal of Ontario SPCA Investigative Services

4 Concern Re: Trucks Turning on Highway 6 near Sandusk Road

5 Discussion Re: Trucks Turning at King and Main Street, Hagersville

E. APPROVAL OF PREVIOUS MEETING MINUTES

1 Minutes from the regular meeting of March 27, 2019

2 Minutes from the closed meeting of March 27, 2019

Resolution 1
Moved By: B. Haggith
Seconded By: K. Boon

1. THAT the Haldimand County Police Services Board hereby adopts the minutes of the regular meeting of the Board held on March 27, 2019, as presented;

2. AND THAT the Haldimand County Police Services Board hereby adopts the minutes of the closed meeting of the Board held on March 27, 2019, as circulated, to remain private and confidential.

CARRIED

F. DELEGATIONS AND PRESENTATIONS

None.

G. CORRESPONDENCE

1 Discussion Re: Speeding on Claymore Crescent, Caledonia

Safety concerns were expressed related to speeding on Claymore Crescent in Caledonia and an e-mail was circulated to the Board members, Board Administrator, C. Manley and Inspector Carter. Discussion ensued regarding process, recommendations, and the relocation of a speed spy device to address the issue. C. Manley to circulate e-mail to the General Manager, Engineering & Capital Works to look into options for the area.

H. REPORTS

1 Monthly Report from the Detachment Commander

No dashboard report was available at this time. Inspector Carter reviewed the March monthly reports with the Board, noting a decrease in criminal reference checks, property crime, street crime, collisions and an increase in assaults, enforcement and calls for service related to domestic disputes and 911. A recent seatbelt traffic campaign held over the Easter weekend and press releases related to fraud awareness were also highlighted. Recent and upcoming Crime Stoppers events were noted. Discussion ensued regarding cannabis greenhouses, retail stores, complaints and the complaint process, foot patrol, visibility, officer complement, clearance rates and speed spy data.

The Board commended the officers for their work and response related to the armed robbery in Caledonia.

Resolution 2
Moved By: B. Haggith
Seconded By: K. Boon

THAT the O.P.P. reports for the month of March, 2019 and the Speed Spy Reports dated April 16, 2019 from Inspector Carter, Haldimand County O.P.P. be hereby received as presented.

CARRIED

2 Update Re: Enforcement at Parks over the Summer Months

The Board was advised that the Summer Student Municipal Enforcement Officer will be providing coverage on Saturdays throughout the summer. Park hours will be enforced based on signage.

3 Update Re: Withdrawal of Ontario SPCA Investigative Services

Due to recent changes with the SPCA, Municipal Enforcement Officers will respond to animal cruelty complaints. It was noted that the County by-law includes some of these changes. Discussion continued related to by-law enforcement in the County.

4 Concern Re: Trucks Turning on Highway 6 near Sandusk Road

The Ministry of Transportation has been contacted regarding this issue and potential solutions were discussed.

5 Board Financials and Current Reserve Figures

Resolution 3
Moved By: B. Haggith
Seconded By: K. Boon

THAT the Haldimand County Police Services Board hereby receives the Board Financials and Current Reserve Figures, dated April 15, 2019, as information.

CARRIED

6 Haldimand County Provincial Offences Act Ticket Issuance Statistics

Amending the statistics to only show a five or ten year comparison was discussed.

Resolution 4
Moved By: K. Boon
Seconded By: B. Haggith

THAT the Haldimand County Police Services Board hereby receives the March, 2019 Haldimand County Provincial Offences Act Ticket Issuance Reports, as presented.

CARRIED

I. UNFINISHED BUSINESS

1 Clarification on Legislation Re: Disposal of Recovered Bicycles

The County Solicitor has advised that the Police Services Act prohibits the Board from donating recovered bicycles. Until the property is sold, it remains a police matter. It was recommended that the O.P.P. seek advice from the Ministry's legal department on how to proceed.

2 Donation to Crime Stoppers of Haldimand & Norfolk Opioid and Fentanyl Initiative

Resolution 5
Moved By: K. Boon
Seconded By: B. Haggith

THAT the Haldimand County Police Services Board support the Crime Stoppers of Haldimand & Norfolk Opioid and Fentanyl Initiative with a $1000 donation from the Police Services Board - Donations/Gifts budget.

CARRIED

3 Motion Re: Board Objectives and Priorities

Resolution 6
Moved By: K. Boon
Seconded By: B. Haggith

THAT the following objectives and priorities be included in the 2020-2022 O.P.P. Action Plan and Board Business Plan:

- Enforcement of speed (specifically on Highway 6, north of Caledonia and in school zones);

  - Use of photo radar, additional speed signs, and/or rumble strips to assist in enforcement;
- Reduction in accidents through visibility and enforcement;
- Place more emphasis on education and community awareness related to opioid/drug use, mental health, 911 calls/hang-ups; and
- Enhanced police visibility.

CARRIED

4 Proposed Amendment to Recognition Policy 01-2006

B. Haggith reviewed the additional award category and criteria with the Board. Discussion ensued regarding the annual recognition award ceremony.

Resolution 7
Moved By: K. Boon
Seconded By: B. Haggith

THAT the Haldimand County Police Services Board Recognition Policy 01-2006 be approved, as amended.

CARRIED

5 Verbal Update Re: Parking By-law Amendment - Towing of Vehicles - Quarry

The Board was advised that this by-law was passed at the April 23, 2019 Council meeting. It will act as a proactive approach to enforce the area and address community safety and parking issues. Currently, signage will be installed and the area will be a tow away zone. Once the short wording has been legislatively approved, the vehicle owner will also receive a parking infraction notice.

6 Verbal Update Re: Provincial Appointments

To date, one provincial appointment has been finalized. No information has been received regarding the second vacancy. The Board will be updated as information becomes available.

J. NEW BUSINESS

1 Discussion Re: Trucks Turning at King and Main Streets, Hagersville

A by-law restricting heavy vehicle traffic turning at this intersection in Hagersville was passed at the April 23, 2019 Council meeting. An e-mail was circulated to the Board members, Board Administrator, C. Manley and Inspector Carter regarding this matter.

K. BY-LAWS (if required)

None.

L. CLOSED SESSION (if required)

None.

M. DATE AND TIME OF NEXT MEETING

The next meeting of the Board was set for Wednesday, May 29, 2019 at 9:30 a.m. in the Community Boardroom, Haldimand County OPP Detachment, Cayuga

N. ADJOURNMENT

Resolution 8
Moved By: B. Haggith
Seconded By: K. Boon

THAT this meeting is now adjourned at 11:34 a.m.

CARRIED

_____

CHAIR

_____

ADMINISTRATOR