OFFICIAL PLAN

of the

CITY OF ST. THOMAS

AMENDMENT NO. 97

PREPARED BY

CITY OF ST. THOMAS PLANNING & BUILDING SERVICES DEPARTMENT

DILLON CONSULTING LIMITED

THE CITY OF ST. THOMAS

BY-LAW NO. 29-2021

The Council of the Corporation of the City of St. Thomas, pursuant to Section 17(22) of the Planning Act, R.S.O. 1990, as amended hereby enacts as follows:

1. That Official Plan Amendment No. 97 to the City of St. Thomas Official Plan, including the attached Schedules and Explanatory Text, is hereby adopted.

2. This By-law shall come into force and take effect on the day of the final passing thereof.

Enacted and passed this 16th day of February, 2021.

Joe Preston, Mayor

Maria Konefal, City Clerk

TABLE OF CONTENTS

STATEMENT OF COMPONENTS

PART A PREAMBLE TO AMENDMENT NO. 97

1. Location
2. Purpose
3. Basis

PART B THE AMENDMENT

1. Introductory Statement
2. Details of the Amendment
3. Implementation and Interpretation
4. Official Plan Schedule "A"

PART C LIST OF APPENDICES

Appendix I: Location Map – Official Plan Changes

Appendix II: Notice of Public Meeting/Public Information Sessions

Appendix III: Minutes of Statutory Public Meeting

Appendix IV: Planning Reports to Council

Appendix V: Concurrent Implementing Zoning By-law Amendment - By-Law No. 30- 2021

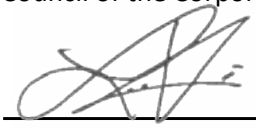
STATEMENT OF COMPONENTS

PART A - THE PREAMBLE - does not constitute part of this Amendment.

PART B - THE AMENDMENT - the following text and map, designated Schedule "I", constitute Amendment No. 97 to the Official Plan of the City of St. Thomas.

Also attached is **PART C – THE APPENDICES** – which do not constitute part of this amendment. The appendices (I to V) contain the supporting documentation for the amendment and the record of public involvement associated with this amendment.

I, Lou Pompilii, Director of Planning & Building Services of the Corporation of the City of St. Thomas, do hereby certify that the following (Part B) is a true copy of Official Plan Amendment No. 97 adopted by the Council of the Corporation of the City of St. Thomas (By-law No. 29-2021).



Lou Pompilii
Director of Planning & Building Services

PART A – PREAMBLE

1. LOCATION

The areas to which this Amendment applies are identified on the Location Map, attached as Appendix I to this Amendment.

2. PURPOSE

The purpose of Part 1 of this Amendment is as follows:

a) Amend the land use designation of certain lands identified on the Location Plan from "Rural Area" to "Residential" on Schedule "A" - Land Use Plan to the Official Plan of the City of St.Thomas, and such lands will be subject to the "Residential Policies" of the Official Plan.

b) Amend the land use designation of certain lands identified on the Location Plan from "Employment Lands" to "Residential" on Schedule "A" - Land Use Plan to the Official Plan of the City of St. Thomas, and such lands will be subject to the "Residential Policies" of the Official Plan.

The purpose of Part 2 of this amendment is as follows:

a) Update the period of the Plan.

b) Update the population projections, population capacity, housing demand and housing mix targets for the Plan.

c) Add policies specific to additional dwelling units to the Residential polices section of the Plan.

d) Update the definition of affordable housing to be consistent with the Province's definition as per the 2020 PPS and establish an updated affordable housing target.

The purpose of Part 3 of this amendment is as follows:

To consolidate Schedule A – Land Use Plan to the Official Plan to recognize all updates to such Schedule, including the updates made by this amendment.

3. BASIS

The basis for Part 1 of this Amendment is as follows:

3.1 Certain lands brought into the City of St. Thomas from the Township of Southwold in 1995 remained outside of the urban service area and were designated “Rural Area” in the City of St. Thomas Official Plan through OPA 42 on June 23rd, 1997. To accommodate urban development pressures on the lands shown as Area 1 identified on the attached Appendix I Location Plan, the City of St. Thomas is required to amend its Official Plan to provide appropriate land use designations to guide future development on those lands.

3.2 Municipal water and sanitary sewer services can be extended to the new areas being proposed for urban development and there is sufficient water supply and sanitary sewage treatment capacity available in the City’s water and waste water systems to accommodate the planned growth (refer to Appendix III: Servicing Analysis Report).

3.3 The lands shown as Area 1 on the attached Appendix I Location Plan which are currently designated "Rural Area" and “Employment Lands” in the Official Plan are being designated for urban residential development. The redesignation of these areas to permit the change in land use from agricultural to urban type uses requires justification of the proposed change in accordance with the Provincial Policy Statement (refer to the Planning Justification Report in Appendix II).

3.4 Area 1 is comprised of six Parts that are subject to the proposed amendment. Located in the northwest quadrant of the City (see Appendix I Location Plan), the six Parts include the following:

Part (i) is 1.17 hectares in area and includes two existing residential lots fronting onto Sunset Drive
Part (ii) is .75 hectares in area and includes one existing residential lot fronting onto Major Line.
Part (iii) is 5.51 hectares in area and includes two existing residential lots, a vacant lot zoned for residential use and 3 hectares of land currently used for crops.
Part (iv) is 5.58 hectares in area and includes two residential lots, one of which has approximately 3.7 hectares of vacant area that is landlocked by railway tracks and ravines.
Part (v) is 15 hectares in area and is currently predominantly cropped.
Part (vi) is 38.43 hectares in area and consists of two parcels currently cropped but for which there is development interest.

3.5 The Update of the Population Forecast, Housing Demand and Residential Land Need, dated June 2018 (refer to Appendix III) projected a 20 year residential land supply requirement of ± 76 ha. (±188 ac.) for the City of St. Thomas. The City proposes to assign that land supply to Area 1 through this Official Plan Amendment.

3.6 Urban development on the subject lands would be compatible with existing and planned land uses on the adjacent lands in the built-up area of the City.

3.7 Area 1 contains vacant tablelands with a gently sloping topography that are physically suited for development and the lands front onto the City's arterial road network.

3.8 There are no potentially developable vacant tablelands surrounding the City of St. Thomas with lower Agricultural Land Capability ratings. Area 1 includes land classified as prime agricultural land and does not comprise specialty crop areas. As part of the Settlement Boundary Expansion Analysis, alternative potential settlement areas were evaluated. There were no reasonable alternatives to avoid prime agricultural land or lower priority agricultural lands as all of the potential settlement areas include prime agricultural lands. Area 1 was selected as the preferred area given that it is surrounded by designated urban uses through the City of St. Thomas Official Plan to the west, the Municipality of Central Elgin Official Plan to the east, and the Township of Southwold to the north.

3.9 To assess the minimum distance separation requirements, an evaluation of the capability of existing barns within and adjacent to the potential settlement areas was undertaken. Any barns on lands in proximity to Area 1 that would be capable of agricultural use have already been designated for urban land uses or would be impacted by intervening urban development, therefore no minimum distance separation is anticipated to be required.

3.10 Environmental considerations associated with development in Area 1 can be mitigated through policy implementation. The two principle landowners with development interest are completing an update to the Lynhurst Subwatershed Study, which will inform decision making on matters of natural heritage.

3.11 The City of St. Thomas consulted with local First Nations communities within southwestern Ontario on the Positioned for Growth process and the proposed settlement area expansion into Area 1. The City focused its consultation efforts on communities with known or potential interest in the St. Thomas area. Consultation was initiated through written communication and a reply was received from the Chippewa of the Thames First Nation (COTTFN). After reviewing the proposed information, the COTTFN identified minimal concerns and requested electronic copies of any updates and notifications. Further, if there is any Archaeology Assessment conducted in this area for future development, they require notification and the opportunity to actively participate by sending First Nation Field Liaisons on behalf of the COTTFN.

3.12 A public meeting on the proposed amendment was hosted by Council on June 24th, 2020 via the Zoom Webinar format. Comments from Council and the public included inquiries about servicing, commercial uses, the City's housing targets and compatibility with existing uses (kennel). No objections to the proposed amendment were received. A copy of the minutes is attached as Appendix III.

The basis for Part 2 of this amendment is as follows:

3.13 The City of St. Thomas prepared technical documents to address the consistency requirements of the 2020 Provincial Policy Statement including an update to the Population, Housing and Employment Projections Study, Land Supply Update and Affordable Housing Targets. The policy recommendations contained in those documents require incorporation into the City of St. Thomas Official Plan.

3.14 Subsection 16(3) of the Planning Act requires that an official plan shall contain policies that authorize the use of additional residential units by authorizing the use of two residential units in a detached house, semi-detached house or rowhouse; and the use of a residential unit in a building or structure ancillary to a detached house, semi-detached house or rowhouse. The City's Official Plan currently contains policies related to converted dwellings, but those policies do not deal with buildings and structures ancillary to a detached, semi-detached or rowhouse. New policies are being added to the Plan to bring it into conformity with Subsection 16(3) of the Planning Act.

3.15 The City's Official Plan does not currently contain a definition for affordable housing, but only refers to the definition from provincial policy. The City's 2018 Long Term St. Thomas-Elgin Affordable & Social Housing Strategy recommended that the City include a definition within its housing policies, and that definition mirror the definition from the PPS. A revise Subsection 6.2.6 is being included to address this recommendation.

The basis for Part 3 of this amendment is as follows:

3.16 To consolidate Schedule A – Land Use Plan to the Official Plan to recognize all updates to such Schedule, including the updates made by this amendment.

PART B - THE AMENDMENT

1. INTRODUCTORY STATEMENT

All of this part of the document entitled "Part B - the Amendment" consisting of the following text and schedules constitutes Amendment No. 97 to the Official Plan of the City of St. Thomas.

2. DETAILS OF THE AMENDMENT

The Official Plan is amended as follows:

Part 1 of the Official Plan Amendment

Item 1.1: Schedule "A" Land Use Plan to the Official Plan of the City of St. Thomas is amended by designating the lands identified as Item 1.1 on the Location Plan, attached in Appendix I to this amendment, from "Rural Area" to "Residential".

Item 1.2: Schedule "A" Land Use Plan to the Official Plan of the City of St. Thomas is amended by designating the lands identified as Item 1.2 on the Location Plan, attached in Appendix I to this amendment, from "Employment Lands" to "Residential".

Part 2 of the Official Plan Amendment

Item 2.1 (Subsection 1: Framework of the Official Plan)

Subsection 1.1.4 is amended by deleting the first sentence and replacing it with the following sentence:

"1.1.4 The land use policies and designations are to guide development, redevelopment and/or infill/intensification in the City of St. Thomas for the period ending in 2038."

Item 2.2 (Subsection 3.1: Population Projection)

Subsection 3.1.1 is deleted and replaced by the following new subsection:

"3.1.1 A population of 50,600 persons by the year 2041 is projected. This target reflects the anticipated growth patterns in the London Housing Market Area."

Item 2.3 (Subsection 3.2: Population Capacity)

Subsection 3.2 is deleted and replaced by the following new subsection:

"3.2.1 The population capacity for the City of St. Thomas is as follows:

Projected 2038 demand for 3,975 low density, 567 medium density and 568 high density residential units.

Projected year 2038 gross residential land supply requirement to accommodate the projected housing demand is up to ± 76 ha. (±188 ac.)."

Item 2.4 (Subsection 3.3.1: Housing)

"3.3.1 In accordance with the City's Affordable and Social Housing Strategy, the demand for housing as of 2016 was for 67.5% owner-occupied and 32.5% rental accommodation."

Item 2.5 (Subsection 5.1: Residential)

Subsection 5.1.3.1 is deleted and replaced with the following new subsection:

"5.1.3.1 The "Residential" designation on Schedule "A" means the predominant use of land shall be for low, medium and high density residential use. Certain other uses are permitted subject to policies in this section. The target housing mix for the City will comprise about 78% low density, 11% medium density, and 11% high density residential development."

Item 2.6 (Subsection 5.1: Residential – Additional Dwelling Units)

Subsection 5.1.3.7 is amended by adding the following new subsection:

"5.1.3.7.1 Additional Dwelling Units

Additional residential units are separate and complete dwelling units that are created within a single detached, semi-detached or rowhouse, regardless of whether the physical alteration of the house is required to create two residential units. The following policies will apply to the development of second residential units:

a) Additional residential units are permitted in a detached house, semi-detached house or rowhouse and in a building or structure ancillary to a detached house, semi-detached house or rowhouse.

b) The lands on which the additional dwelling unit is to be created are zoned to permit residential use other than as an ancillary use.

c) An amendment to the comprehensive Zoning By-law will be implemented to put into effect the policies of this subsection.

d) The additional dwelling unit can be independently serviced with full municipal sanitary sewage, storm sewage and piped water services.

e) Development of an additional residential dwelling unit will be subject to the following criteria:

   i. The additional dwelling unit shall not change the general characteristics of a single detached, semi-detached or rowhouse structure; and

   ii. The additional dwelling unit will comply with the Ontario Building Code and the Fire Code.

Item 2.7 (Subsection 6.1: Background - Housing)

Subsection 6.1.1 is amended by deleting the first sentence and replacing it with the following sentence:

"The City of St. Thomas has prepared a Population Forecast, Housing Demand, and Residential Land Need update to address the requirements of the Province of Ontario 2020 Provincial Policy Statement."

Item 2.8 (Subsection 6.2.6: Affordable Housing Definition and Target)

Subsection 6.2.6 is deleted and replaced with the following new subsection:

"6.2.6 Council shall ensure that a portion of new ownership and rental housing is affordable as defined by provincial policy:

a) in the case of ownership housing, the least expensive of:

1. housing for which the purchase price results in annual accommodation costs which do not exceed 30 percent of gross annual household income for low and moderate income households; or
2. housing for which the purchase price is at least 10 percent below the average purchase price of a resale unit in the regional market area;

b) in the case of rental housing, the least expensive of:

1. a unit for which the rent does not exceed 30 percent of gross annual household income for low and moderate income households; or
2. a unit for which the rent is at or below the average market rent of a unit in the regional market area.

Council shall endeavour to meet a target of 807 affordable housing units (35 per year) by 2041."

Part 3 of the Official Plan Amendment

Schedule "A" Land Use Plan to the Official Plan of the City of St. Thomas is further amended by deleting Schedule "A" and replacing it with a new Schedule "A", attached as Schedule I and forming part of this amendment, consolidating the land use designation changes and mapping updates made under Part 1 of this amendment.

3. IMPLEMENTATION AND INTERPRETATION

The implementation and interpretation of this Amendment shall be in accordance with the respective policies of the City of St. Thomas Official Plan.

SCHEDULE "A"

TO THE OFFICIAL PLAN OF THE CITY OF ST. THOMAS

LAND USE PLAN

LAND USE DESIGNATION

- Residential
- Downtown Residential
- Talbot West
- Talbot Central
- Talbot East
- Power Centre
- Major Commercial
- Mixed Use Development
- Secondary Commercial
- Minor Commercial
- Highway Commercial
- Office Professional
- Employment Lands
- Business Employment
- Open Space and Conservation
- STORC Complex
- Natural Heritage
- Natural Hazard
- Railway Tourism
- Rural Area
- Ed / Rec Complex
- Former Waste Site
- Transfer Station
- Sewage Treatement Plant

Note:Source MOE Waste Disposal Site Inventory - June 1991

Municipality of Central Elgin

Township of Southwold

Municipality of Central Elgin

Municipality of Central Elgin

ST. THOMAS
THE RAILWAY CITY

Legend

- Railway
- Water Course
- Water Body
- St. Thomas Boundary

N
W E
S

Prepared by the St. Thomas
Planning and Building Services
Department

0 400 800 1200
Metres

12/04/2019

Schedule "A" forms part of the Official Plan of the City of St. Thomas and must be read in conjunction with the written text.

SCHEDULE "I"
TO OFFICIAL PLAN AMENDMENT No. 97
CITY OF ST. THOMAS

PART C - THE APPENDICES

Appendix I: Location Map – Official Plan Changes

Appendix II: Notice of Public Meeting/Public Information Sessions

Appendix III: Minutes of Statutory Public Meeting

Appendix IV: Planning Reports to Council

Appendix V: Planning Justification Report

Appendix VI: Concurrent Implementing Zoning By-law Amendment - By-Law No. 30-2021

APPENDIX I:

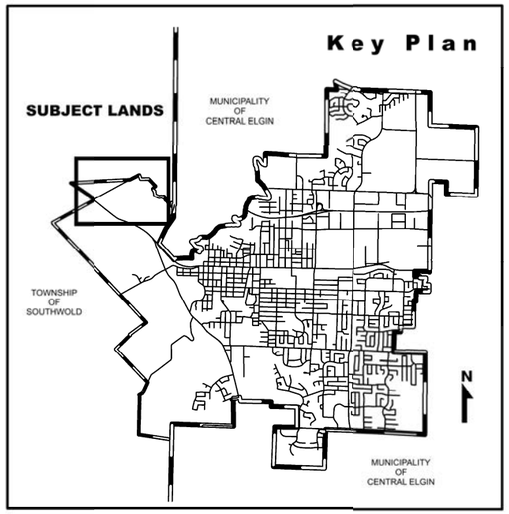
LOCATION MAP – OFFICIAL PLAN CHANGES

APPENDIX I

OFFICIAL PLAN and
CONCURRENT IMPLEMENTING
ZONING BY-LAW AMENDMENT

LOCATION PLAN





LEGEND:

Subject Lands

NORTH

0 25 50 75

METRES

Scale: 1:1,500

Note: 2015 Aerial Photography

03/02/2020

APPENDIX II:

NOTICE OF PUBLIC MEETING/PUBLIC INFORMATION SESSIONS

NOTICE OF AN APPLICATION AND PUBLIC MEETING CONCERNING PROPOSED OFFICIAL PLAN AND ZONING BY-LAW AMENDMENTS

Proposed Urban Settlement Area Expansion, City of St. Thomas

TAKE NOTICE that:

a) pursuant to Subsections 22(6.4)(a) and 34(10.7)(a) of the Planning Act, R.S.O. 1990, as amended, concurrent applications have been made for approval of a proposed Official Plan Amendment and Zoning By-law Amendment. Access to the information and material provided under subsections 22(4), 22(5), 34(10.1) and 34(10.2) in support of the applications is available for public access, and

b) a concurrent Public Meeting, pursuant to Subsections 22(1)(b) and 34(12) of the Planning Act, R.S.O. 1990, as amended, will be held by the Council of the Corporation of the City of St. Thomas on the 6th day of April, 2020 at 5:15 P.M. in the Council Chambers of the City Hall, 545 Talbot Street, St. Thomas, to consider amendments to the Official Plan and Zoning By-Law 50-88. The purpose of the Public Meeting is to afford any person that attends, an opportunity to make representation with respect to the official plan and zoning proposals.

The subject lands are shown outlined in a heavy solid line on the Key Map below. The lands can be described as Concession ENBTR, Part of Lots A, B, C, D, Concession NTRE, Part of Lot 45, Concession NTRE GORE, Part of Lots A, B, Plan 34, Part of Lots 7, 8, City of St. Thomas.

The Corporation of the City of St. Thomas is proposing to amend the St. Thomas Official Plan and Zoning By-Law 50-88 to expand the existing Settlement Area Boundary to allow for future residential uses on the subject lands.

The subject lands are designated Employment Lands and Rural Area within the Official Plan of the St. Thomas Planning Area. As part of the "Positioned for Growth" process that was undertaken by the Corporation of the City of St. Thomas to address the City's future residential land requirements as required through the Planning Act, R.S.O. 1990, as amended, the subject lands were identified as the preferred area for future residential development. An amendment to the Official Plan is required to change the existing land use designations to reflect the recommendations for future residential development in the Positioned for Growth Study.

The subject lands are currently located within an Employment Lands (EL) Zone and site-specific First Residential (R1) and Residential Development (R7) Zones to the City of St. Thomas Zoning By-law 50-88. To implement the recommendations of the Positioned for Growth Study for future residential development and amendment to By-law 50-88 is required.

The purpose of the proposed amendments is to amend the City of St. Thomas Official Plan and Zoning By-Law 50-88 to implement the recommendations of the Positioned for Growth Study. The effect of the amendments will to allow for residential uses on the subject lands subject to landowners obtaining future land use planning application approvals for the proposed development.

ANY PERSON OR PUBLIC BODY may attend the Public Meeting and/or make written or verbal representation either in support of, or in opposition to the proposed Official Plan amendment and Zoning By-law amendment.

If you wish to be notified of the decision of the City of St. Thomas on the proposed Official Plan and Zoning By-law amendments, you must make a written request to the address below.

If a person or public body does not make oral submissions at a public meeting or make written submissions to the City of St. Thomas before the proposed Official Plan amendment is adopted or the proposed Zoning By-law is passed, the person or public body is not entitled to appeal the decision of the Council of the City of St. Thomas to the Local Planning Appeal Tribunal.

If a person or public body does not make oral submissions at a public meeting or make written submissions to the City of St. Thomas before the proposed Official Plan amendment is adopted or the proposed Zoning By-law is passed, the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to add the person or public body as a party.

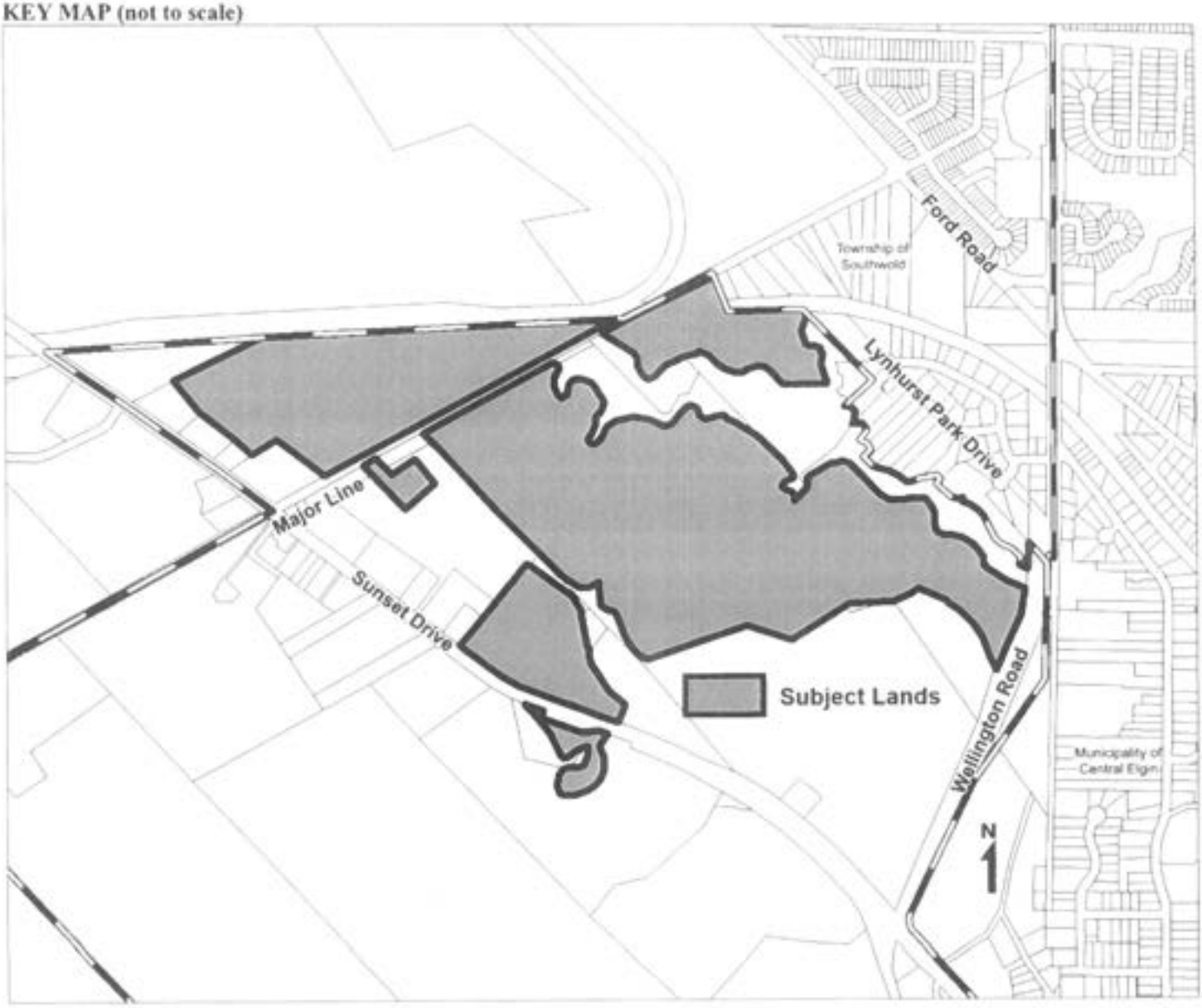
PUBLIC ACCESS TO INFORMATION relating to the proposed Official Plan and Zoning By-law Amendments is available for inspection daily, from Monday to Friday, between 8:30 A.M. and 4:30 P.M. at the Planning Office, 9 Mondamin Street, St. Thomas, or may be accessed on the City's website https://www.stthomas.ca/living_here/notices_to_residents or the City's Facebook page https://www.facebook.com/pages/City-of-St-Thomas-Ontario/120624024692752.

DATED at the City of St. Thomas, this 11th day of March, 2020.

KEY MAP (on reverse)

Maria Konefal, City Clerk
City of St. Thomas
545 Talbot Street
St. Thomas, Ontario
N5P 3V7

KEY MAP (not to scale)



POSTPONMENT OF PUBLIC MEETING

Please note, the public meeting for the Positioned for Growth, the City's Proposed Urban Settlement Area Expansion, scheduled for April 6th, 2020 at 5:15, has been postponed due to the COVID 19 and escalated precautions being taken at City Hall.

The City will provide notice at such time that a new public meeting can be scheduled and the details for participation are decided.

DATED at the City of St. Thomas, this 1st day of April, 2020.

NOTICE OF AN APPLICATION AND PUBLIC MEETING CONCERNING PROPOSED OFFICIAL PLAN AND ZONING BY-LAW AMENDMENTS

Proposed Urban Settlement Area Expansion, City of St. Thomas

TAKE NOTICE that:

a) pursuant to Subsections 22(6.4)(a) and 34(10.7)(a) of the Planning Act, R.S.O. 1990, as amended, concurrent applications have been made for approval of a proposed Official Plan Amendment and Zoning By-law Amendment. Access to the information and material provided under subsections 22(4), 22(5), 34(10.1) and 34(10.2) in support of the applications is available for public access, and

b) a concurrent Public Meeting, pursuant to Subsections 22(1)(b) and 34(12) of the Planning Act, R.S.O. 1990, as amended, will be held by the Council of the Corporation of the City of St. Thomas on the 24th day of June, 2020 at 5:00 P.M. to consider amendments to the Official Plan and Zoning By-Law 50-88. The purpose of the Public Meeting is to afford any person that attends, an opportunity to make representation with respect to the official plan and zoning proposals. The meeting will be conducted by Zoom Webinar and detailed information for this meeting can be found at https://www.stthomas.ca/living_here/notices_to_residents, under 'Planning Notices.'

The subject lands are shown outlined in a heavy solid line on the Key Map below. The lands can be described as Concession ENBTR, Part of Lots A, B, C, D, Concession NTRE, Part of Lot 45, Concession NTRE GORE, Part of Lots A, B, Plan 34, Part of Lots 7, 8, City of St. Thomas.

The Corporation of the City of St. Thomas is proposing to amend the St. Thomas Official Plan and Zoning By-Law 50-88 to expand the existing Settlement Area Boundary to allow for future residential uses on the subject lands.

The subject lands are designated Employment Lands and Rural Area within the Official Plan of the St. Thomas Planning Area. As part of the "Positioned for Growth" process that was undertaken by the Corporation of the City of St. Thomas to address the City's future residential land requirements as required through the Planning Act, R.S.O. 1990, as amended, the subject lands were identified as the preferred area for future residential development. An amendment to the Official Plan is required to change the existing land use designations to reflect the recommendations for future residential development in the Positioned for Growth Study.

The subject lands are currently located within an Employment Lands (EL) Zone and site-specific First Residential (R1) and Residential Development (R7) Zones to the City of St. Thomas Zoning By-law 50-88. To implement the recommendations of the Positioned for Growth Study for future residential development and amendment to By-law 50-88 is required.

The purpose of the proposed amendments is to amend the City of St. Thomas Official Plan and Zoning By-Law 50-88 to implement the recommendations of the Positioned for Growth Study. The effect of the amendments will be to allow for residential uses on the subject lands subject to landowners obtaining future land use planning application approvals for the proposed development.

ANY PERSON OR PUBLIC BODY may attend the Public Meeting and/or make written or verbal representation either in support of, or in opposition to the proposed Official Plan amendment and Zoning By-law amendment.

If you wish to be notified of the decision of the City of St. Thomas on the proposed Official Plan and Zoning By-law amendments, you must make a written request to the address below.

If a person or public body does not make oral submissions at a public meeting or make written submissions to the City of St. Thomas before the proposed Official Plan amendment is adopted or the proposed Zoning By-law is passed, the person or public body is not entitled to appeal the decision of the Council of the City of St. Thomas to the Local Planning Appeal Tribunal.

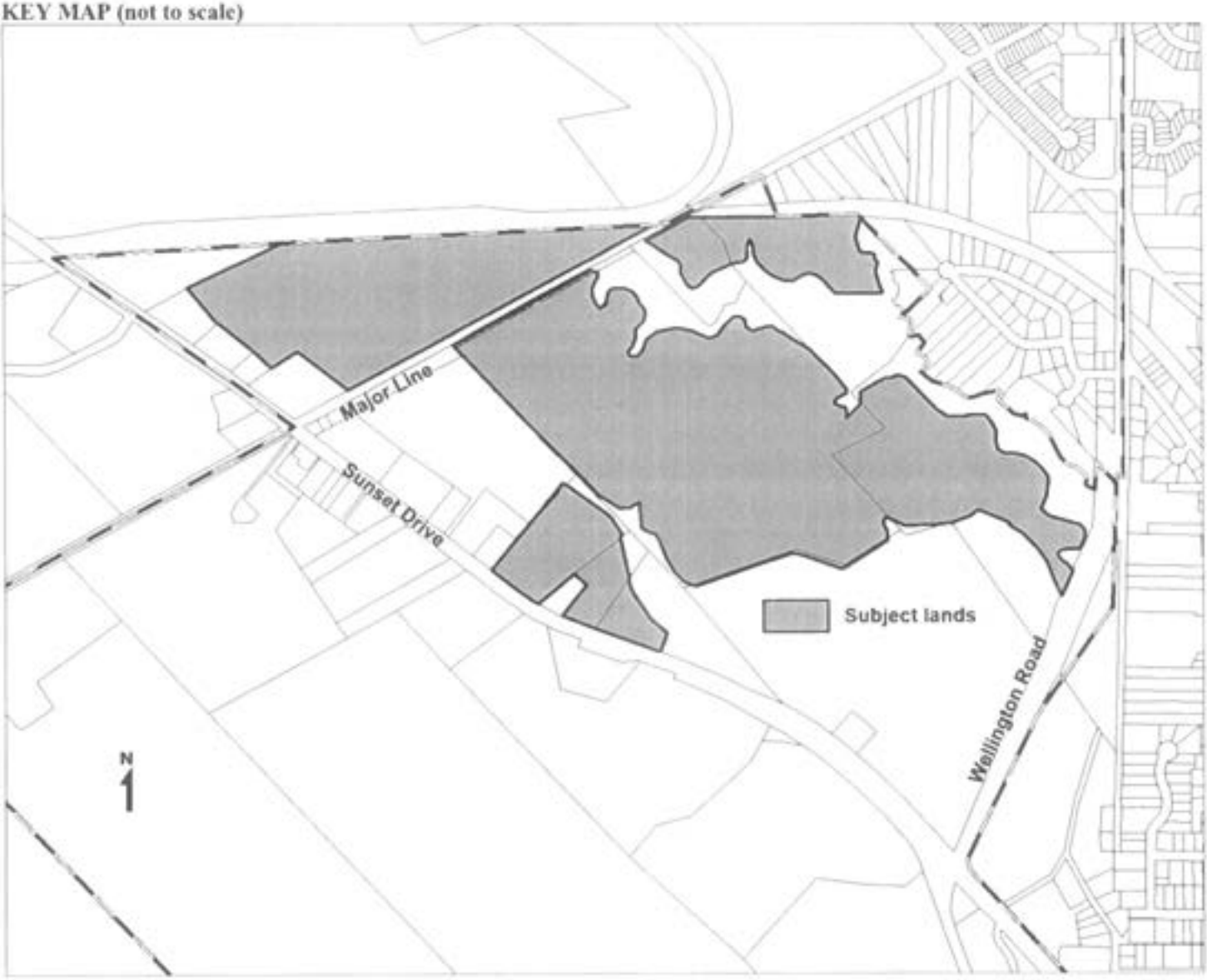
If a person or public body does not make oral submissions at a public meeting or make written submissions to the City of St. Thomas before the proposed Official Plan amendment is adopted or the proposed Zoning By-law is passed, the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to add the person or public body as a party.

PUBLIC ACCESS TO INFORMATION relating to the proposed Official Plan and Zoning By-law Amendments may be accessed on the City's website https://www.stthomas.ca/living_here/notices_to_residents or the City's Facebook page https://www.facebook.com/pages/City-of-St-Thomas-Ontario/120624024692752.

DATED at the City of St. Thomas, this 3rd day of June, 2020.

Maria Konefal, City Clerk
City of St. Thomas
545 Talbot Street
St. Thomas, Ontario
N5P 3V7

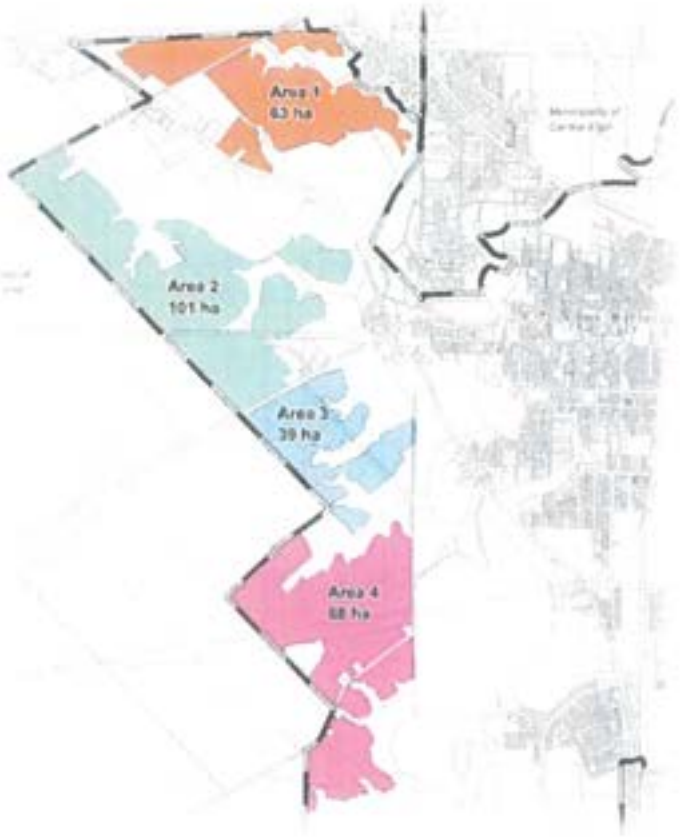
KEY MAP (not to scale)



St. Thomas is growing!

How and where should we grow? Give us your input on the four potential growth areas.

The City of St. Thomas is completing a review of its Official Plan to accommodate a **20-year residential growth forecast of 50,600 people by 2041**. In order to do so, St. Thomas needs to expand its Urban Area in the Official Plan. These four areas are the last remaining lands within the municipal boundary that can accommodate this level of projected residential growth.



The purpose of this study is to undertake the **necessary planning and engineering studies** to identify and technically support the preferred expansion lands; to prepare the Official Plan Amendment to bring those lands into the Urban Area and designate them for development; and identify citywide **recreational and cultural infrastructure**, and **fire protection services** needed to support that growth.

Join Us for Coffee Conversations:

Wednesday, May 8, 2019

2:00 to 4:00pm and 6:00 to 8:00pm

St. Thomas-Elgin Memorial Centre, 80 Wilson Street

Coffee and refreshments will be provided.

The Coffee Conversations event is an opportunity for residents to discuss the project in an informal format. Come for a coffee and light refreshments. Chat with **Mayor Preston and Members of City Council**, and learn more about the project from City staff and the Project Team. We'll be on- hand to **answer your questions and gather your feedback**.

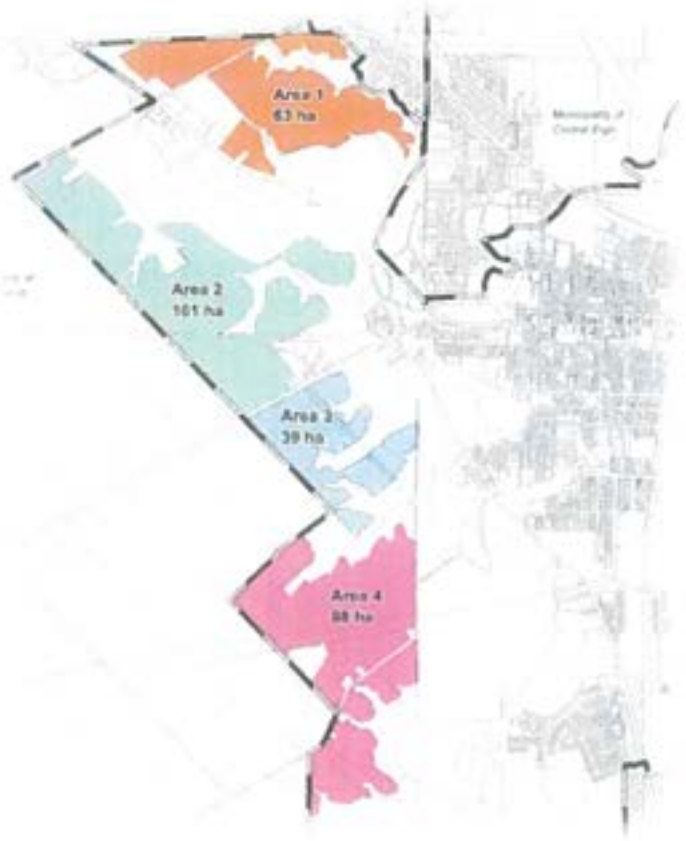
www.StThomas.ca/PositionedforGrowth

All comments and information received from individuals, stakeholder groups and agencies regarding this study are being collected to assist the City of St. Thomas in completing the Positioned for Growth Study. Information will be collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act and with the exception of personal information, all information provided will become part of the public record. This notice is also available on the City's website and social media accounts.

St. Thomas is growing!

How and where should we grow? Give us your feedback on the evaluation of the four potential growth areas and the preliminary preferred area.

The City of St. Thomas is completing a review of its Official Plan to accommodate a **20-year residential growth forecast of 50,600 people by 2041**. In order to do so, St. Thomas needs to expand its Urban Area in the Official Plan. These four areas are the last remaining lands within the municipal boundary that can accommodate this level of projected residential growth.



The purpose of this study is to undertake the **necessary planning and engineering studies** to identify and technically support the preferred expansion lands; to prepare the Official Plan Amendment to bring those lands into the Urban Area and designate them for development; and identify citywide **recreational and cultural infrastructure**, and **fire protection services** needed to support that growth.

In **May 2019 we hosted Coffee Conversations**, an opportunity for residents to discuss the project and potential growth areas in an informal format. Since then, the project team has **conducted the evaluation of the potential growth areas** based on the feedback provided by community members and technical analysis. We are, again, looking for **input and feedback from residents** on the results and preliminary preferred growth area.

Join Us for Positioning St. Thomas for Growth Open House:

Monday, July 8th, 2019

6:30 to 7:30pm

St. Thomas Public Library, Carnegie Room (lower level), 153 Curtis Street

The open house event is an opportunity for residents to discuss the project in an informal format. Come for a coffee and light refreshments. Chat with the Project Steering Committee and consultants and learn more about the preliminary preferred growth area. We'll be on- hand to **answer your questions and gather your feedback**. For more information on the project, please visit the project website:

www.StThomas.ca/PositionedforGrowth

All comments and information received from individuals, stakeholder groups and agencies regarding this study are being collected to assist the City of St. Thomas in completing the Positioned for Growth Study. Information will be collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act and with the exception of personal information, all information provided will become part of the public record. This notice is also available on the City's website and social media accounts.

APPENDIX III:

MINUTES OF STATUTORY PUBLIC MEETING

THE THIRTY-FOURTH MEETING OF THE ONE HUNDRED AND FORTIETH COUNCIL OF THE CORPORATION OF THE CITY OF ST. THOMAS

COUNCIL CHAMBERS
CITY HALL **JUNE 24, 2020**

5:05 p.m. The meeting convened with His Worship, Mayor J. Preston, presiding.

ATTENDANCE

Members	Officials
Mayor J. Preston	W. Graves, City Manager
Councillor L. Baldwin-Sands	M. Konefal, City Clerk
G. Clarke	C. Andersen, Systems Support Coordinator
J. Herbert	P. Keenan, Director, Planning
J. Kohler	J. Lawrence, Director, Environmental Services
S. Peters	K. McClure, Planner
J. Rymal	J. McCoomb, Manager of Planning Services
M. Tinlin	M. Noon, GIS/Planning Technician
S. Wookey	D. Sheridan, Director of Finance and City Treasurer

DISCLOSURES OF INTEREST

Nil.

Mayor Preston stated that this was a Council meeting to host public meetings on matters requiring approvals under the Planning Act.

Mayor Preston advised members of the public that if a person or public body does not make oral submission at the public meeting or make written submission to the Corporation of the City of St. Thomas before the by-laws are passed, the person or public body is not entitled to appeal the decision of the Council of the Corporation of the City of St. Thomas to the Local Planning Appeal Tribunal.

He further advised that if a person or public body does not make oral submission at the public meeting or make written submission to the Corporation of the City of St. Thomas before the by-laws are passed, the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to do so.

Mayor Preston asked what method of notice and when was notice given to the public for this meeting.

The City Clerk stated that notice was given in the St. Thomas Times-Journal on the 3rd of June, 2020 and that in accordance with Council policies, notice was mailed to property owners within 120 metres of each of the properties that are subject to tonight's public meetings.

Proposed Zoning By-Law Amendment - 50 Wellington Street - Institutional Use - Additional Permitted Use

Mayor Preston called the meeting to order and stated that this was a public meeting as required by the Planning Act to afford any person an opportunity to make representation with respect to a proposed zoning by-law amendment, which would permit institutional use as an additional permitted use on the property located at 50 Wellington Street.

The Manager of Planning Services explained the proposed zoning by-law amendment, the reason for the amendment, and how the amendment proposed to accomplish the purpose.

Mayor Preston asked whether there were any written submissions on the proposed zoning by-law amendment.

The City Clerk stated a letter had been received from Barbara Saunders, 65 Gladstone Avenue expressing concern about property values and taxes, parking and traffic, ownership of the property, and the definition of institutional use.

Mayor Preston asked whether Council had any questions.

The members inquired about the definition of institutional use.

The Manager of Planning Services provided examples of the types of organizations that could operate under an institutional use and advised that he had responded to Ms. Saunders's letter.

The members inquired about parking in the area.

The Manager of Planning Services advised that there are parking spaces allocated for courthouse use and onsite parking spaces allocated for the tenants of 50 Wellington Street.

Mayor Preston stated that the meeting would now be opened to questions from the public for those attending who have not already submitted their concerns or comments to the City.

Mayor Preston stated that for those listening on a computer, tablet or smart phone to please click the 'Raise Hand' icon and that for those using a telephone to please dial *9. He asked the public that when given the opportunity to speak to please provide their name and address for the Clerk's record.

Barbara Saunders, 65 Gladstone Avenue inquired whether the building was protected by designation under the Ontario Heritage Act and whether the public would be notified of a new tenant.

Mayor Preston advised that the property was protected under the Ontario Heritage Act.

The Manager of Planning Services advised that there was no obligation to advise members of the public about a new tenant.

The members inquired whether a residential use could occur on the property.

Mayor Preston advised that the property has already been zoned for a residential use and that the proposed amendment was to add another use.

Mike and Judy Bossuyt, owners of 62 Wellington Street advised that they had similar concerns and inquired about the definition of institutional uses.

The Manager of Planning Services advised that he could email the definition contained within the draft by-law to Mr. and Mrs. Bossuyt.

Mayor Preston stated that if there were no further questions, any person wishing further information on the actions of Council regarding the passing of a by-law on the proposed amendment, should e-mail Customer Service at customerservice@stthomas.ca, indicating which public meeting they wish to be notified on and providing their name and address. He further stated that for those who do not have access to a computer and wish to be notified, should call Customer Service at 519-631-1680, extension "0" and provide the same information.

Mayor Preston declared that this public meeting was now concluded, and that Council would defer consideration of the zoning by-law amendment until a subsequent meeting of Council.

Proposed Zoning By-Law Amendment - 34 Hiawatha Street - Semi Detached Dwelling as Additional Permitted Use

Mayor Preston called the meeting to order and stated that this was a public meeting as required by the Planning Act to afford any person an opportunity to make representation with respect to a proposed zoning by-law amendment, which would permit a semi-detached dwelling as an additional permitted use on the property located at 34 Hiawatha Street.

The Planner explained the proposed zoning by-law amendment, the reason for the amendment, and how the amendment proposed to accomplish the purpose.

Mayor Preston asked if there were any written submissions on the proposed zoning by-law amendment.

The City Clerk stated that a letter had been received from Barry Pearson, 25 Hiawatha Street, concerning whether the property is adequately sized for a semi-detached dwelling.

The Planner advised that while the R4 standard suggests a minimum of 300 square metres per dwelling unit, the City's Housing Study recommends certain reductions for affordable housing and that the proposal corresponds with the recommendations in the Study.

Mayor Preston asked whether Council had any questions.

The members inquired about the City's disposal of surplus property process and whether the property was subject to site plan control process.

The Planner advised that the property is not subject to the site plan control process.

Mayor Preston advised that the previous Council had declared the property to be surplus to its needs and that Habitat for Humanity had indicated its interest in purchasing the property.

The members inquired about parking for the property.

The Planner advised that adequate parking had been provided by the applicants for the site.

Mayor Preston stated that the meeting would now be opened to questions from the public for those attending who have not already submitted their concerns or comments to the City.

Mayor Preston stated that for those listening on a computer, tablet or smart phone to please click the 'Raise Hand' icon and that for those using a telephone to please dial *9. He asked the public that when given the opportunity to speak to please provide their name and address for the Clerk's record.

Julie Mueller, 90 Scott Street advised that she and her husband had used the property for parking of their vehicles and expressed concern about the surplus lands process. Ms. Mueller stated that a tree on the property may be affecting the foundation of her house.

Mayor Preston suggested that Ms. Mueller provide her email address to Customer Service so that further information about the surplus lands process may be provided to her.

Mayor Preston stated that if there were no further questions, any person wishing further information on the actions of Council regarding the passing of a by-law on the proposed amendment, should e-mail Customer Service at customerservice@stthomas.ca, indicating which public meeting they wish to be notified on and providing their name and address. He further stated that for those who do not have access to a computer and wish to be notified, should call Customer Service at 519-631-1680, extension "0" and provide the same information.

Mayor Preston declared that this public meeting was now concluded, and that Council would defer consideration of the zoning by-law amendment until a subsequent meeting of Council.

Proposed Official Plan and Zoning By-Law Amendments - Positioned for Growth - Implementation of Recommendations

Mayor Preston called the meeting to order and stated that this was a public meeting as required by the Planning Act to afford any person an opportunity to make representation with respect to proposed Official Plan and zoning by-law amendments to implement the recommendations of the Positioned for Growth study.

The Manager of Planning Services explained the proposed Official Plan and zoning by-law amendments, the reason for the amendments, and how the amendments propose to accomplish the purpose.

Mayor Preston asked if there were any written submissions on the proposed Official Plan and zoning by-law amendments.

The City Clerk stated that a letter had been received from Robert Weare suggesting the installation of a new WYE track for the Paynes Railway spur and that a letter had been received

from Anne McDonald, K-9 Concepts, Sunset Drive advising that she operates a dog boarding kennel and is concerned about the possibility of future complaints regarding barking dogs at her kennel.

Mayor Preston asked whether Council had any questions.

The members inquired whether the continuation of rail use would impede development.

The Manager of Planning Services advised that the Official Plan contains policies relating to land use compatibility and that the developer would be required to analyze what the potential noise and vibration impact would be and to institute setbacks or measures to address the impact including any structural additions to the buildings.

The members inquired whether an Official Plan amendment would be required to permit a plumbing business on a property currently being used for an electrical business.

The Manager of Planning Services advised that the zone is being set up as an accessory to a residential use, not requiring an Official Plan change but that a future use may require a zoning change or a minor variance to the zoning by-law.

The members inquired whether the lands are subject to an archaeological assessment and how would lands be changed from an agricultural use to a residential use.

The Manager of Planning Services advised that archaeological studies would be required and that the only time lands could be designated as residential would be at the time of a comprehensive review, such as this process.

The members inquired whether there was sufficient capacity at the landfill for new development.

The Director, Environmental Services advised that there should be sufficient capacity at the landfill site being used by the City and that the City could look into other alternatives in the future.

The members inquired about the need for commercial activities as part of residential development.

The Manager of Planning Services advised that there are opportunities for commercial development along the area designated as highway commercial use and that such development is often dependent upon market interest.

The members inquired whether the location of any higher density units could be identified at this time.

The Manager of Planning Services advised that there would be several phases in any given plan of subdivision and that blocks of land assigned for future development may change depending upon future demand. He further advised that the City has policies relating to compatibility of higher density housing.

Mayor Preston stated that the meeting would now be opened to questions from the public for those attending who have not already submitted their concerns or comments to the City.

Mayor Preston stated that for those listening on a computer, tablet or smart phone to please click the ‘Raise Hand’ icon and that for those using a telephone to please dial *9. He asked the public that when given the opportunity to speak to please provide their name and address for the Clerk’s record.

Dave Merkley, 9596 Sunset Drive inquired whether existing properties would be mandated to connect to municipal services and whether there would be an option to connect.

The Manager of Planning Services advised that a connection to municipal services would be required should any new development on the properties be proposed.

The Director, Environmental Services advised that an option to connect would be available.

Mr. Merkley inquired about the potential to sell land to a developer.

The Manager of Planning Services advised that a private property owner would need to make application for a consent to sever and further, that the subject land may need an Official Plan and/or Zoning By-Law amendment if it required re-designation. He further advised that a requirement for notification and consultation would be similar to this public meeting.

Brandon Fox, 20 Doral Court inquired about the proposed population and housing forecast to the year 2038.

The Manager of Planning Services advised that the City's Housing Strategy developed by the City's consultant contains the population and housing forecast and that the document is updated after every Canadian Census.

Mr. Fox inquired about changes to a developer's master plan relating to density.

The Manager of Planning Services advised that developers use a master plan as part of their marketing and that developers would need to address the City's policies relating to compatibility of higher density housing.

Anne McDonald, 9830 Sunset Drive inquired about noise

The Manager of Planning Services advised that nothing in the Official Plan or the city's policies would require notification of a dog kennel but that the Planning Department could advise developers that a kennel is located in the area.

Matt Campbell, Zelinka Consultants and Deren Lyle, Cyril J. Demeyere Limited expressed thanks to City staff for preparing the amendments.

The members expressed appreciation to the Township of Southwold Council and staff for their role in working with the City.

Mayor Preston stated that if there were no further questions, any person wishing further information on the actions of Council regarding the passing of a by-law on the proposed amendments, should e-mail Customer Service at customerservice@stthomas.ca, indicating which public meeting they wish to be notified on and providing their name and address. He further stated that for those who do not have access to a computer and wish to be notified, should call Customer Service at 519-631-1680, extension "0" and provide the same information.

Mayor Preston declared that this public meeting was now concluded, and that Council would defer consideration of the Official Plan and zoning by-law amendments until a subsequent meeting of Council.

ADJOURNMENT

6:48 p.m. The meeting adjourned.

APPENDIX IV:

STAFF PLANNING REPORTS TO COUNCIL

ST. THOMAS	**Report No.** PD-06-2020
	File No. 3-01-20
Directed to: Mayor Joe Preston and Members of City Council	**Date Authored:** 2/10/2020 **Meeting Date:** 2/18/2020
Department: Planning & Building Services Department	**Attachment**
Prepared by: Jim McCoomb, Manager of Planning Services	
Subject: Proposed Official Plan and Zoning By-law Amendments, Positioned for Growth Implementation	

RECOMMENDATION:

THAT: Report PD-06-2020 relating to proposed official plan and zoning by-law amendments to implement the recommendations of the Positioned for Growth study be received for information; and further,

THAT: Council authorize staff to prepare draft amendments to the St. Thomas Official Plan and By-law 50-88 to designate Area 1 for residential use and implement the recommendations of the Positioned for Growth study and address policy matters in the Official Plan related to housing; and further,

THAT: a public meeting be scheduled for ***April 6th, 2020 at 5:15 p.m.*** in accordance with Ontario Regulations 543/06 and 545/06, as amended.

ORIGIN:

On July 15th, 2019 Council received a status report on the progress of the Positioned for Growth study. That report recommended approval of Area 1 as the preferred area and authorized staff to proceed with the next steps in the study process (Report PD-34-2019). Council authorized staff and the consulting team to proceed with the preparation of the Official Plan and Zoning by-law amendments for Area 1.

The need for additional lands for residential growth derived from a study completed by Dillon Consulting and Watson & Associates (Update of the Population Forecast, Housing Demand and Residential Land Need – Final Report, June 2018) that was completed in support of the Long Term St. Thomas-Elgin Affordable & Social Housing Strategy (Tim Welch Consulting Inc., June 2018). These two documents also contain recommendations for policy changes to the City's Official Plan (OP) to update housing targets and establish policies to assist in the implementation of affordable housing.

REPORT:

Dillon Consulting is completing a Planning Justification Report (PJR) in support of the Official Plan and Zoning By-law amendments that are required to implement the recommendations of the Positioned for Growth study. The PJR analyzes the proposed changes from the standpoint of the 2014 Provincial Policy Statement, the City's Official Plan policies and the regulations of the St. Thomas Zoning By-law 50-88. The draft PJR recommendations relative to planning matters include:

1. Adjust the Settlement Area Boundary within the Official Plan to include Area 1.
2. Designate Area 1 as Residential within Official Plan Schedule A (Land Use Plan).
3. Update the Zoning By-law to convert the Employment Lands in Area 1 to Residential.

In addition to the implementation of the Positioned for Growth recommendations, the proposed Official Plan amendment will implement some policy changes to the OP based on the recommendations of the Population Forecast, Housing Demand and Residential Land Need study and the Affordable Housing Strategy. These are considered housekeeping changes as they largely update information already contained in the plan based on the results of the studies.

Proposed changes from the Population Forecast, Housing Demand and Residential Land Need study include:

- 2017 to 2041 Population Forecast: 38,900 to 50,600 population
- 20-Year (2018 – 2038) Housing Demand of 5110 units (3,975 low density; 567 medium density and 568 high density)
- 20-Year (2018 – 2038) Housing Mix of 78% low density; 11% medium density; and 11% high density residential units
- 20-Year (2018 – 2038) Residential Land Supply Requirement of 76 hectares of residential designated lands in the Official Plan.

Proposed changes from the Affordable Housing Strategy include:

- The definition for affordable housing as found in Section 6 of the 2014 Provincial Policy Statement (PPS)

be incorporated into the Official Plan.

- The OP incorporate a target of constructing 807 units (35 per year) of affordable housing by 2041.
- The City include policies to permit second units (additional dwelling units) in single detached, semi-detached and townhouse dwellings.

It is noted that the Affordable Housing Strategy recommended that the City strengthen its affordable housing policies in the OP to address inclusionary zoning. However, the Province through Bill 108 has effectively taken inclusionary zoning off the table as an option except in very particular circumstances and no changes to the OP are proposed at this time.

Other reports being completed in support of the Positioned for Growth study include the Municipal Servicing and Transportation Technical Memos, the Fire Location Study report and the Parks and Recreation Master Plan. Staff will report back to Council in March to advise when all the reports are complete and available for review on the City's website.

STAFF RECOMMENDATION:

Staff are recommending that:

- Council designate Area 1 to support future residential development;
- Council amend the Official Plan and Zoning By-law to implement the recommendations of the Positioned for Growth study, the Population Forecast, Housing Demand and Residential Land Need Update and the Affordable & Social Housing Strategy;
- Council establish a date for the statutory public meeting as required by the Planning Act to support the proposed Official Plan and Zoning By-law amendments; and
- A public open house be held in accordance with the approved Positioned for Growth work plan for the afternoon of the public meeting as an opportunity for further public engagement.

Respectfully submitted,

Jim McCoomb, MCIP, RPP
Manager of Planning Services

Reviewed By: _____ Env. Services _____ Treasury _____ Parks _____ HR _____ City Clerk _____ Other

ST.THOMAS	**Report No.** PD-10-2020
	File No. 135
Directed to: Mayor Joe Preston and Members of City Council	**Date Authored:** 3/3/2020 **Meeting Date:** 3/9/2020
Department: Planning & Building Services Department	**Attachment**
Prepared by: Jim McCoomb, Manager of Planning Services	
Subject: Positioned for Growth Documentation, Planning & Engineering	

RECOMMENDATION

THAT: Report PD-10-2020 relating to documentation for the Positioned for Growth study be received for information.

ORIGIN:

On February 18th, 2020 Council received a report on the progress of the Positioned for Growth study with a recommendation to establish a public meeting date for the necessary Official Plan and Zoning By-law amendments required to implement Area 1 as the preferred option for new residential growth going forward.

The decision to move forward with Area 1 is the culmination of a two-phase approach by which alternative areas were evaluated and a preferred alternative was identified and documented. Four technical areas were reviewed including planning, engineering, fire services and parks and recreation. This has resulted in four documents being prepared in support of the Positioned for Growth Study, being:

Transportation Technical Memo
Engineering Technical Memo
Parks and Recreation Master Plan (2020)
Fire Station Location Study

A Planning Justification Report (PJR) has been prepared to support the proposed Official Plan and Zoning By-law amendments needed to implement Area 1 from a land use planning perspective. The PJR briefly summarizes the study process and then examines the land use planning rationale behind Area1 from the perspective of the Provincial Policy Statement and the policies of the Official Plan. The Transportation and Engineering Technical Memos are attached to the PJR as Appendices B and C. This is being provided to Council early in advance of the public meetings as there is considerable information to review.

The draft Official Plan and zoning amendments are found in Appendices D and E of the PJR. The PJR may be accessed on the City's website at the following page:

https://www.stthomas.ca/positionedforgrowth

The Parks and Recreation Master Plan and the Fire Station Location Study will be provided separately by others for Council's review.

Respectfully submitted,

Jim McCoomb, MCIP, RPP
Manager of Planning Services

Reviewed By: Env. Services | Treasury | Parks | HR | City Clerk | Other

ST. THOMAS	**Report No.** PD-43-2020
	File No. 135
Directed to: Mayor Joe Preston and Members of City Council	**Date Authored:** 11/19/2020 **Meeting Date:** 12/07/2020
Department: Planning & Building Services Department	**Attachment**
Prepared by: Jim McCoomb, Manager of Planning Services	
Subject: Positioned for Growth, Area 1 Technical Working Group	

RECOMMENDATION:

THAT: Report PD-43-2020 relating to the Area 1 Technical Working Group for the Positioned for Growth study be received for information.

ORIGIN:

The Planning Justification Report (PJR) for the Positioned for Growth study concluded with 6 key recommendations. One of those was to establish a developer/landowners group to encourage coordination and ease of development. Staff have had further discussions with Dillon Consulting, who prepared the PJR, to obtain clarification on the intended composition and purpose of the group. Dillon advises that their intent was for a technical working group similar to what has been established in the past for other growth area studies. The composition would be the landowners/developers and/or their representatives, key City staff and agency staff on an as required basis (i.e. KCCA). Based on this, the group will be referred to as the Area 1 Technical Working Group.

It is proposed that the staff to be assigned to the group will consist of the Manager of Development & Compliance from Environmental Services, the Director of Planning & Building Services and the Manager of Planning Services. The group will meet on a monthly or as required basis and provide periodic status updates to Council on progress being made towards bringing development of Area 1 to fruition. Meetings of the group will begin just after the new year and will be conducted virtually in accordance with Covid-19 protocols.

Respectfully submitted,

Jim McCoomb, MCIP, RPP
Manager of Planning Services

Reviewed By:

Env. Services	Planning & Building	Treasury	City Clerk	City Manager	

ST. THOMAS
THE RAILWAY CITY

	Report No. PD-12-2021
	File No. 135
Directed to: Mayor Joe Preston and Members of City Council	**Date Authored:** 02/09/2021 **Meeting Date:** 02/16/2021
Department: Planning & Building Services Department	**Attachment** MMAH Comments
Prepared by: Jim McCoomb, Manager of Planning Services	
Subject: Positioned for Growth, Official Plan and Zoning By-law Amendments	

RECOMMENDATION

THAT: Report PD-12-2021 relating to the Official Plan and Zoning By-law Amendments for Area 1 for the Positioned for Growth study be received for information.

ORIGIN:

The public meeting for the Positioned for Growth Official Plan and Zoning By-law amendments was held via Zoom Webinar on June 24th, 2020. Since the public meeting, staff have been working with the consultants representing the major landowners to discuss possible adjustments to the boundary between the proposed Residential and the Natural Heritage designations in an effort to recognize farm washouts that the developers would like to fill in. This approach has been done in the past so long as it can be supported with sufficient justification to address the Natural Heritage policies of the Official Plan. However, this has been complicated by the fact that there is an update being completed to the Lynhurst Area Subwatershed Study that has a direct relationship to any changes to the Natural Heritage designation. The consultants completing the subwatershed update have identified some potential concerns with some of the proposed alterations, therefore they are considered premature until the subwatershed update has been further advanced.

While staff had hoped to continue to work with the landowner's consultants on this matter, staff are also mindful that significant time has elapsed since the public meeting and feel it is time to move on with the City's amendments. Further, the amendment to the Official Plan (OP) also deals with updates to the OP document to implement recommendations that have come from other foundation studies such as the City's housing study. For this reason staff have placed the amendments on the February 16th 2021 agenda for Council's consideration.

It is noted that the developers will be required to submit zoning amendment applications in the future once their particular subdivision configurations are worked out. They will have the opportunity at that time to apply for concurrent amendments to the Official Plan, with justification, should they still seek to adjust the boundary where the washouts exist.

Staff also circulated the draft Official Plan amendment to the Ministry of Municipal Affairs and Housing for review under their One Window Plan Review function. The Ministry provided a few comments (attached), which staff have already responded to (also attached).

Respectfully submitted,

Jim McCoomb, MCIP, RPP
Manager of Planning Services

Reviewed By:

Env. Services	Planning & Building	Treasury	City Clerk	City Manager	

Ministry of
Municipal Affairs
and Housing

Municipal Services Office
Western Ontario
2nd Floor
659 Exeter Road
London ON N6E 1L3
Tel: 519 873-4020
Toll Free: 1 800 265-4736

Ministère des
Affaires municipales
et du Logement

Bureau des services aux municipalités
de l'Ouest de l'Ontario
2e étage
659 Exeter Road
London ON N6E 1L3
Tél : 519 873-4020
Sans frais : 1 800 265-4736

Ontario

December 14, 2020

Sent via e-mail only

Jim McCoomb
Manager of Planning Services
City of St. Thomas
9 Mondamin Street
St. Thomas Ontario, N5P 2T9
jmccoomb@stthomas.ca

Subject: **One Window Provincial Review Comments**
City of St. Thomas
Draft Official Plan Amendment 97 (Positioned for Growth)
MMAH File # 34-EOPA-206579

Dear Jim McCoomb:

Thank you for circulating draft City of St. Thomas Official Plan Amendment 97 (OPA 97) to the Ministry of Municipal Affairs and Housing for review and comment. This matter was further circulated through the One Window Planning Service to the Ministry of Agriculture, Food, and Rural Affairs (OMAFRA), the Ministry of Natural Resources and Forestry (MNRF), the Ministry of the Environment, Conservation and Parks (MECP), and the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI). It is recognized that the Official Plan Amendment (OPA) is exempt from the Minister's approval and the following One Window comments are provided to the City for its consideration in making a decision on this matter.

It is understood that OPA 97 proposes several amendments to existing Official Plan policies, as well as adds new policies, including:

- Expansion of the City's Settlement Area, including the re-designation of rural lands and employment lands to residential;
- Refinements to the City's Population Projections and Population Capacity to 2038
- The addition of Additional Dwelling Unit policies; and,
- The addition of Affordable Housing Definition and Target sections

The current Provincial Policy Statement (PPS) came into effect on May 1, 2020. You can download a copy of the new PPS at https://www.ontario.ca/page/provincial-policy-statement-2020. Consideration was given to this matter in terms of the criteria and policies of the PPS, 2020.

It is understood that the City of St. Thomas is currently working on an update to its Official Plan. This process involves undertaking a Comprehensive Review (CR) to ensure the Official Plan is consistent with the PPS, 2020. While it is understood that a CR was undertaken to inform this amendment, typically amendments of this scope and scale that consider a range of City-wide policy provisions would be part of a municipality's Official Plan update under Section 26 of the Planning Act.

The following suggestions identify where additional justification may be needed to demonstrate consistency with the PPS 2020, prior to the City's decision regarding the proposed settlement area expansion in OPA 97.

- The lands considered for settlement area boundary expansion in preferred Area 1 are currently designated "Employment Lands" and "Rural Area". The "Rural Area" designation in the St. Thomas Official Plan consists of Canada Land Inventory (CLI) Class 1-3 prime agricultural lands. Clarification is suggested about how the proposed settlement area boundary expansion is consistent with PPS sections 1.1.3.8 and 2.3.5 for the removal of land from prime agricultural areas for settlement boundary expansions. To demonstrate consistency with the PPS, additional rationale is suggested for the following areas:

    - In accordance with PPS policy 1.1.3.8 c) 2., the City should be satisfied that sufficient analysis was undertaken to demonstrate that alternative locations have been evaluated, and that there are no reasonable alternatives which avoid prime agricultural areas.

    - PPS policy 1.1.3.8 d) requires that new or expanding settlement areas comply with the Minimum Distance Separation (MDS) formulae. It has not been demonstrated how MDS has been complied with. Additional justification is needed to address the existing livestock operations identified in Appendix A of the PJR.

- The City should be satisfied that the existing official plan includes provisions to require that necessary technical studies, such as environmental impact statements, agricultural impact assessments, cultural heritage studies, and archaeological assessments, be provided for future development applications on lands within the proposed settlement area boundary expansion to ensure that future development is consistent with the PPS.

We trust that these comments are helpful to the City in its consideration of the Official Plan Amendment. Provincial staff are available to discuss these comments. If you have any questions or concerns, please contact the undersigned. By copy of this letter, MMAH requests the City provide the undersigned with notice of decision for this OPA.

Kind regards,
David Stubbs

Planner
Ministry of Municipal Affairs and Housing

Municipal Services Office – West

CC (e-mail only): Nancy Rutherford, OMAFRA
Karina Cerniavskaja, MNRF
Katherine Kirzati, MHSTCI
Barbara Slattery, MECP

McCoomb, Jim

From: McCoomb, Jim
Sent: December 16, 2020 11:43 AM
To: 'Stubbs, David (MMAH)'
Cc: Knieriem, Michelle (MMAH); Pompilii, Lou; McClure, Kevin
Subject: RE: City of St. Thomas - Positioned for Growth

Good morning David, and thank you for sending along the comments on the City's draft OPA 97 (Positioned for Growth).

With regards to the suggestions made on page 2 of your correspondence, we offer the following reply:

- *In accordance with PPS policy 1.1.3.8 c) 2., the City should be satisfied that sufficient analysis was undertaken to demonstrate that alternative locations have been evaluated, and that there are no reasonable alternatives which avoid prime agricultural areas.*

The selection of Area 1 was made only after a comprehensive selection process that examined four candidate areas. Each area was examined using 20 evaluation criteria during Phase 1 of the Positioned for Growth study. One of these criteria was Agricultural Impacts. The analysis determined that all 4 areas equally consist of Prime Agricultural Lands. There are no candidate areas that consist of lower capability agricultural soils and there are no options within the City limits to avoid prime agricultural areas.

- *PPS policy 1.1.3.8 d) requires that new or expanding settlement areas comply with the Minimum Distance Separation (MDS) formulae. It has not been demonstrated how MDS has been complied with. Additional justification is needed to address the existing livestock operations identified in Appendix A of the PJR.*

The 5 existing livestock operations in proximity to Area 1 identified in Part A of the PJR were identified as part of a desktop exercise, hence the reference to "preliminary analysis". Each was examined more closely and it was determined that 2 have been demolished since the air photo was taken (one due to a subdivision being built on the lands); 1 is a storage shed and is now located adjacent to the new subdivision, so it cannot be converted; 1 is an old barn that is used for storage on a property zoned for Highway Commercial use so livestock is not permitted; and 1 was not a livestock operation but a landowner keeping a couple of ponies and a couple of goats, essentially as pets. That location is not zoned for farm use and is separated from the potentially developable lands in Area 1 by a ravine that is approximately 120 meters wide, so it has been determined to not be of any impact from an MDS perspective.

- *The City should be satisfied that the existing official plan includes provisions to require that necessary technical studies, such as environmental impact statements, agricultural impact assessments, cultural heritage studies, and archaeological assessments, be provided for future development applications on lands within the proposed settlement area boundary expansion to ensure that future development is consistent with the PPS.*

The City is satisfied that such policies do exist, and through the update to the Official Plan that is currently underway we will be updating all policies to ensure compliance with the 2020 PPS.

Once again, thank you for the comments on OPA 97. We look forward to continued dialogue with the Province as we move forward with the Official Plan review and update.

Regards,

Jim

Jim McCoomb, MCIP, RPP
Manager of Planning Services
City of St. Thomas
Planning and Building Services Department
Central Elgin Planning Office, 9 Mondamin Street
St. Thomas, ON N5P 2T9
(☎) Phone 519-631-1680 ext 4188 | (☎) Fax 519-633-4581 | (✉) jmccoomb@stthomas.ca | (🖳) www.stthomas.ca

This email may contain legally privileged and confidential information intended only for the individual(s) or entity(s) named in the message. If the reader of this message is not the intended recipient, or the agent responsible to deliver it to the intended recipient, you are hereby notified that any review, dissemination, distribution or copying of this communication is prohibited. If this communication was received in error, please notify us by reply email and delete the original message.

Please consider the environment before printing this email

From: Stubbs, David (MMAH) <David.Stubbs@ontario.ca>
Sent: December 14, 2020 12:19 PM
To: McCoomb, Jim <jmccoomb@stthomas.ca>
Cc: Knieriem, Michelle (MMAH) <Michelle.Knieriem@ontario.ca>
Subject: RE: City of St. Thomas - Positioned for Growth

CAUTION:
This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon Jim,

Please find attached one-window comments for City of St. Thomas OPA 97 (Positioned for Growth)

Thank you,

David Stubbs
Planner
Ontario
Ministry of Municipal Affairs and Housing
Municipal Services Office - Western
659 Exeter Road, 2nd Floor
London, ON N6E 1L3
Ph: 519-873-4031
Fax: 519-873-4018
Email: David.Stubbs@Ontario.ca

APPENDIX V:

PLANNING JUSTIFICATION REPORT (DILLON CONSULTING, FEBRUARY 2020)

DILLON CONSULTING

CITY OF ST. THOMAS

Positioned for Growth – Planning Justification Report

February 2020 – 18-9022

Table of Contents

1.0 **Introduction** **1**

1.1 Area 1 Context 2

2.0 **Planning Policy Framework** **6**

2.1 Provincial Policy Statement (2014) 6

2.2 St. Thomas Official Plan (Office Consolidation January 2019) 23

2.3 St. Thomas Zoning By-law (50-88) 27

3.0 **Conclusions** **28**

3.1 Recommendations and Next Steps 28

Figures

Figure 1: Area 1 Location in City of St. Thomas

Figure 2: Area 1 Proximity to Other Settlement Areas

Figure 3: Parcels with Additional Supply Limitations as Identified in the 2018 Employment Lands

Appendices

Appendix A - Settlment Boundary Expansion Analysis
Appendix B – Transportation Technical Memo
Appendix C – Engineering Technical Memo
Appendix D - Proposed Official Plan Amendment
Appendix E - Proposed Zoning By-law Amendment

1.0 Introduction

The City of St Thomas has a long history of proactively working with private and public sector partners to position the City for growth and to capitalize on emerging residential, commercial, industrial and institutional development opportunities. In 2010, a settlement area expansion exercise was conducted which reviewed lands within the north-west quadrant of the City along with other land blocks on the west and south-east sides of St. Thomas to accommodate residential and employment growth to 2031. These lands were assessed based on criteria derived from the Provincial Policy Statement (2005) at that time. Based on the high-level assessment, areas of lands on the western side of the City were screened out of the 2010 Settlement Area Expansion and other areas were identified as preferred to accommodate the growth forecast to 2031.

Since the 2010 settlement area expansion (OPA 66), the City has conducted a number of studies to comprehensively review and understand the 2041 land needs of the City. These studies included the 2016 St. Thomas Retail Market Analysis, the 2018 St. Thomas Employment Review and the 2018 Update of the Population Forecast, Housing Demand, and Residential Land Need study ("2018 Population Update"). These studies were undertaken as part of the City's comprehensive review of its Official Plan, and identify a forecast of 50,600 people and 23,800 jobs by 2041 for the City of St. Thomas. After factoring in available land within the City limits, the 2018 Population Update established the need for an additional 76 gross hectares of residential land to accommodate 1,048 residential units to 2041.

To plan for this growth, in December 2018, Council initiated the work plan for the Positioned for Growth (PFG) study which includes a review of four technical areas: planning, engineering, fire services, and parks and recreation. The Positioned for Growth Study is intended to:

- Undertake the necessary Planning and Engineering analysis to identify the preferred expansion lands;
- Prepare the required Planning and Engineering documents to support an amendment to the Official Plan to bring the lands into the Settlement Area and designate them for development; and
- Identify the infrastructure and community services required to support the growth.

Building on the work undertaken in 2010, the Positioned for Growth Study assessed the suitability of the remaining lands located within the municipal boundary of the City and outside of the City's urban built area and settlement area for future residential use.

The Positioned for Growth Study was completed in two phases: (1) evaluation of alternatives, and (2) preferred alternative and documentation. Phase 1 of the project included establishing evaluation criteria derived from by the policies of the Provincial Policy Statement (2014) and evaluating the Four Potential

Settlement Areas to identify a preferred alternative. The results of this analysis identified Area 1 as the preferred area to accommodate future residential development. Details on the process and the results of Phase 1 can be found in **Appendix A**.

To support the Positioned for Growth Study the following documents have also been prepared:

- Positioned for Growth: Transportation Technical Memo (2019) **(Appendix B)**
- Positioned for Growth: Engineering Technical Memo (2020) **(Appendix C)**
- Positioned for Growth: Parks and Recreation Master Plan (2020)
- Positioned for Growth: Fire Station Location Study (underway)

As part of Phase 2, this report along with supporting documentation is being provided in support of the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) ("the proposed amendments") required to bring Area 1 into the Settlement Area and designate the land for residential development. The purpose of this report is to review the proposed amendments with respect to their conformity/consistency with the Provincial Policy Statement, the City of St,. Thomas Official Plan and in the context of the City of St. Thomas Zoning By-law. A copy of the proposed OPA and ZBA have been incldued in **Appendix D and E** respectively

1.1 Area 1 Context

As shown in **Figure 1**, Area 1 is located in the north-western boundary of the City of St. Thomas east of Sunset Drive and west of Wellington Road with Major Line bisecting the area. The area is contiguous with residential land uses within the Municipality of Central Elgin and the Talbotville area in the Township of Southwold as shown in **Figure 2**. Area 1 is 63 hectares in size and is proposed to accommodate up to 1,387 residential units.

As identified in the Transportation Technical Memo **(Appendix B)**, the existing road configuration within, and adjacent to, Area 1 does not require any significant road improvement or changes to accommodate projected growth. The technical report identifies potential road improvements within the City of St. Thomas relating to turn lanes and intersection control (traffic signals). This includes: improvements at Sunset Drive and Major Line via turn lanes; Sunset Drive, Wellington Road, and Talbot Street Roundabout improvements; and upgrades to Major Line from Sunset Drive to the rail crossing. There is also an opportunity to serve Area 1 with conventional transit service once the core internal road network is established with the planned connections out to the broader road network. The technical report considers and identifies opportunities for active transportation including providing sidewalk, cycling infrastructure in future road design, and multi-use trails.

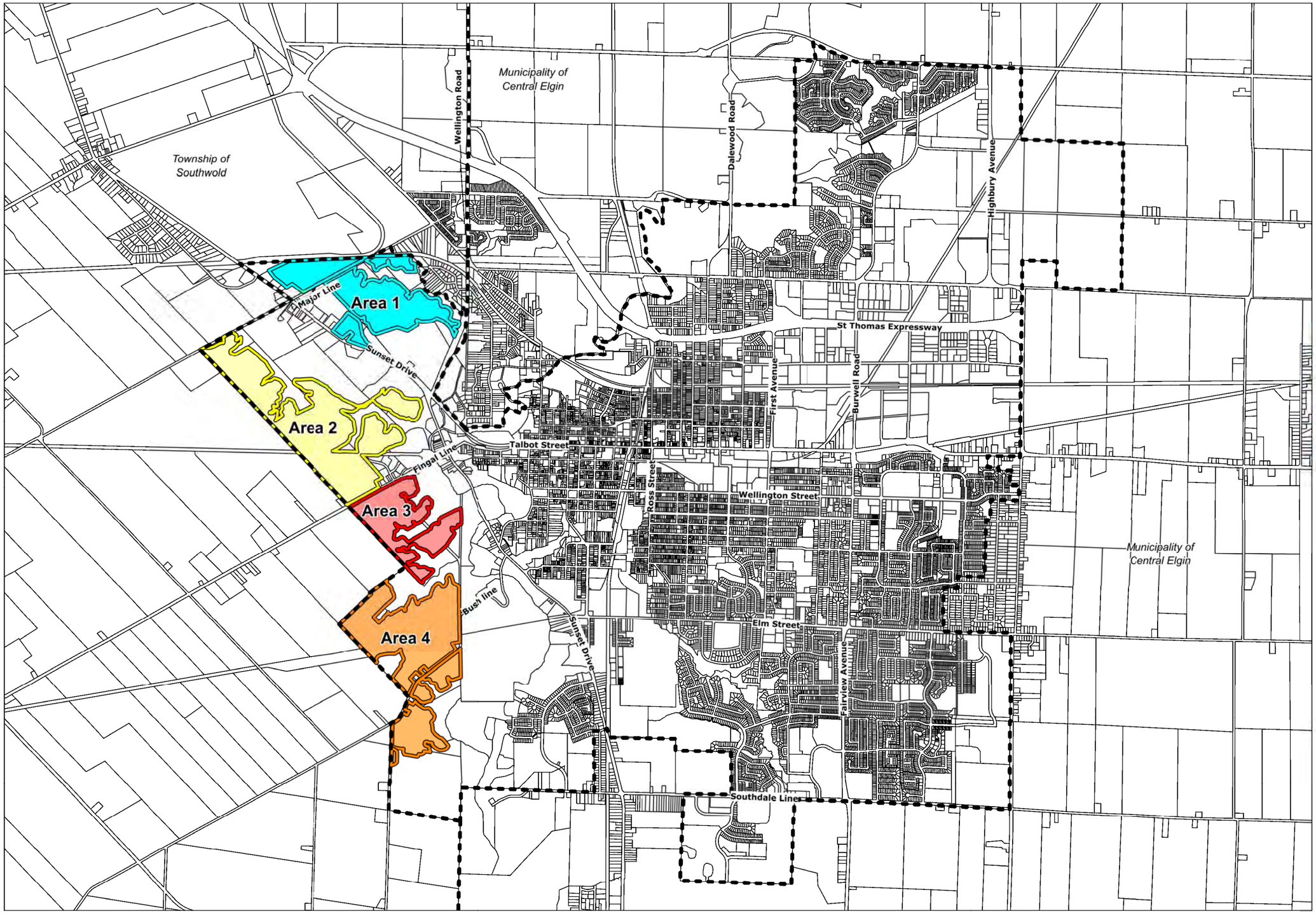
Area 1 will be serviced by municipal sewage and water servicing as identified through the Positioned for Growth: Engineering Technical Memo (2020) **(Appendix C)**. Area 1 is in close proximity to an existing water distribution system with opportunities to connect a proposed 300 mm diameter trunk watermain

to the Township of Southwold Water System, and the City of St. Thomas water system. The proposed trunk watermain could connect to an existing 300 mm diameter watermain (Township of Southwold system off the St. Thomas Secondary System) and to an existing 350 mm diameter water main (St. Thomas water system).

For municipal sewage, the Engineering Technical Memo identifies a proposed pump station at Dodd's Creek crossing at Wellington Road, and an upgrade/replacement of Sunset pumping station and forcemain to service the projected population for the area, and with consideration to future potential settlement area expansions. It also identifies the need for a forcemain between the two Kettle Creek crossings. As identified through the Parks and Recreation Master Plan (2020), Area 1 will include a neighbourhood park including playground equipment to provide accessible free play for children in the area and connections to the core area through a multi-use trail along the abandoned rail corridor that borders the north boundary of Area 1.

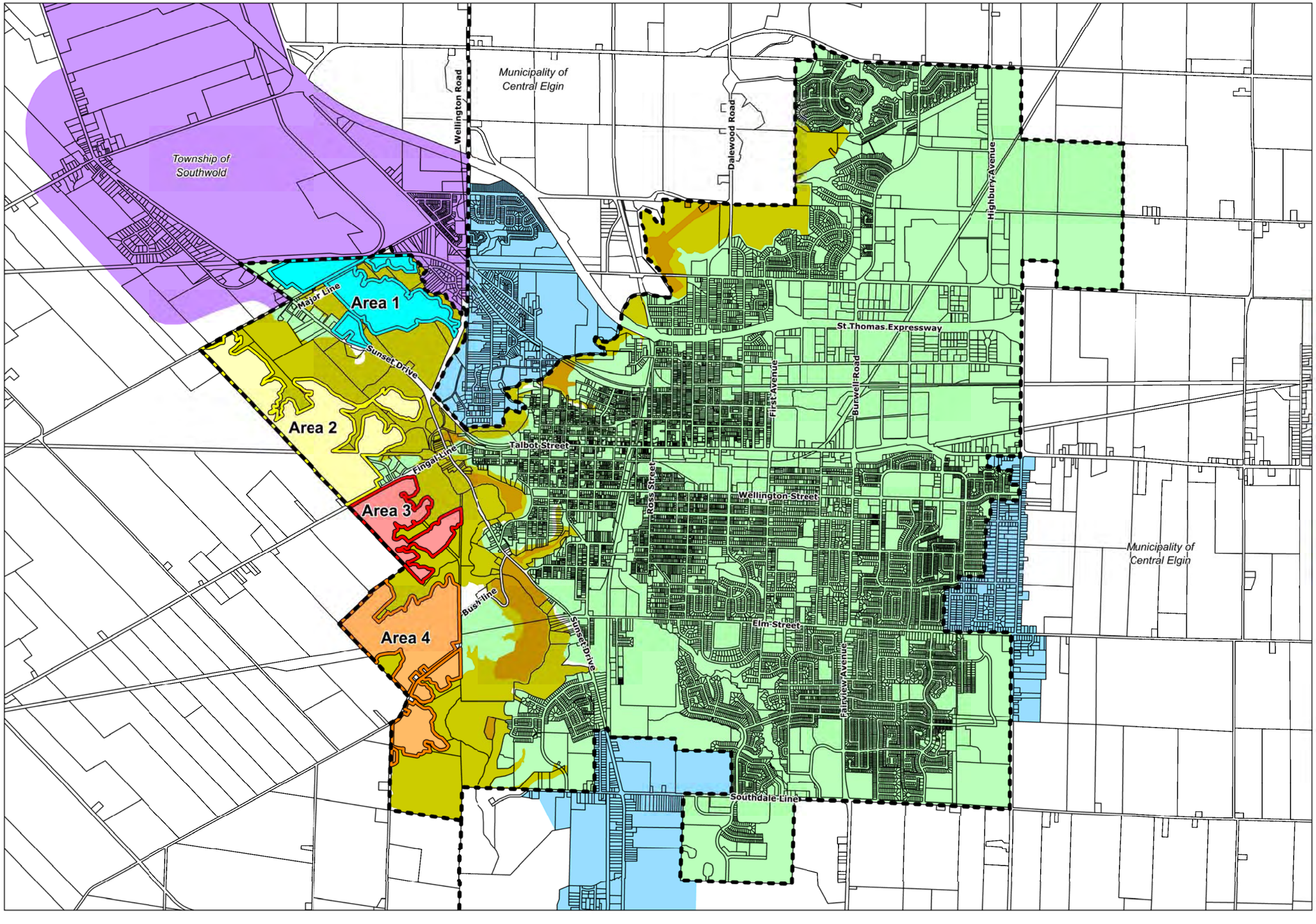
City of St Thomas Settlement Expansion

Figure 1: Area 1 Location in St. Thomas



City of St Thomas Settlement Expansion

Figure 2: Area 1 Proximity to Other Settlement Areas



2.0 Planning Policy Framework

The proposed amendments required to expand the Settlement Area to include Area 1 and re-designation of the lands for residential use are subject to Provincial and local planning policies and regulations, including the Provincial Policy Statement 2014, the City of St. Thomas Official Plan (Office Consolidation January 2019) and the City of St. Thomas Zoning By-law (50-88).

2.1 Provincial Policy Statement (2014)

The Provincial Policy Statement (PPS) provides policy direction on matters of Provincial interest related to land use planning and development. It is required that decisions affecting planning matters "shall be consistent with" the PPS policy statements. This section presents key policies of the PPS, their application to Area 1, and demonstrate how the expansion of the Settlement Area to include Area 1 and the re-designation of land to accommodate residential uses is consistent with the PPS.

Vision for Ontario's Land Use Planning System (Part VI)

The vision within the PPS states that growth and development should be within urban or rural settlement areas while avoiding significant or sensitive resources. Another component of the vision states that that land use should be carefully managed to accommodate appropriate development to meet current and future needs while simultaneously achieving efficient development patterns. Efficient development patterns are described as optimizing the use of the land, resources, and public investment in infrastructure and public service facilities.

Consistency of Area 1:
The addition of Area 1 to the City of St. Thomas Settlement Area is in consistent with the vision of the PPS. By completing this Municipal Comprehensive Review and adding Area 1 to the Settlement Area, the City is carefully managing land use to meet current and future needs. The extension of municipal servicing to Area 1 provides an opportunity to extend servicing to unserviced lots along Sunset Drive and plan for the logical extension of servicing to benefit future development beyond the 20 year planning horizon.

Healthy, Liveable, and Safe Communities (Part V, Policy 1.1.1)

The PPS requires municipalities to support healthy, liveable, and safe communities. Municipalities can achieve this by managing and directing land use into land use patterns that are efficient and resilient. To do so, municipalities consider current and projected needs related to infrastructure and public service facilities, accessibility, cost-effective development patterns, the need to accommodate an appropriate range and mix of residential and other land uses, as well as impacts on the environment.

Policy 1.1.1 states:

Healthy, liveable and safe communities are sustained by:

a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term;

b) accommodating an appropriate range and mix of residential (including second units, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs;

c) avoiding development and land use patterns which may cause environmental or public health and safety concerns;

d) avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas which are adjacent or close to settlement areas;

e) promoting cost-effective development patterns and standards to minimize land consumption and servicing costs;

f) improving accessibility for persons with disabilities and older persons by identifying, preventing and removing land use barriers which restrict their full participation in society;

g) ensuring that necessary infrastructure, electricity generation facilities and transmission and distribution systems, and public service facilities are or will be available to meet current and projected needs; and

h) promoting development and land use patterns that conserve biodiversity and consider the impacts of a changing climate.

Consistency of Area 1:

Area 1 provides sufficient land to accommodate the City's forecasted residential land demand to 2041. The forecasted need included consideration for the demand for low, medium, and high density residential development across the City. Area 1 will support the land demand needed to accommodate low and medium density residential built form.

The delineation of Area 1 avoids existing environmental features and directs development to land that do not have known environmental constraints. Site level opportunities to further consider and mitigate impacts on the environment (e.g., development buffers, Species-at-Risk) will be established during future development approval phases.

The transportation and municipal servicing required to accommodate Area 1 have been presented in **Appendix B and C**. Area 1 is in proximity to existing Residential and Highway Commercial land uses and will use the existing transportation network that can more efficiently accommodate projected growth. Area 1 also provides for an opportunity to extend water and wastewater servicing to the existing, unserviced businesses along Sunset Drive. For increased efficiency of infrastructure and resources, municipal servicing can be sized to accommodate potential future settlement area expansions in the City's remaining lands. In addition, the City is undertaking a Development Charges Background Study to identify how to finance growth-related capital costs.

Sufficient Land (Part V, Policy 1.1.2)

The PPS requires municipalities do long term planning and make sufficient land available to accommodate needs for up to 20 years.

Policy 1.1.2 states:

Sufficient land shall be made available to accommodate an appropriate range and mix of land uses to meet projected needs for a time horizon of up to 20 years. However, where an alternate time period has been established for specific areas of the Province as a result of a provincial planning exercise or a provincial plan, that time frame may be used for municipalities within the area.

Within settlement areas, sufficient land shall be made available through intensification and redevelopment and, if necessary, designated growth areas.

Consistency of Area 1:

By adding Area 1 to the Settlement Area, the City is ensuring that sufficient land is available to accommodate residential land needed to satisfy the 20 year forecasted demand. As part of the residential land need analysis, opportunities for intensification were identified and factored into the land needs analysis. An additional 76 hectares were identified on top of these intensification opportunities, to accommodate the population growth to 2041.

Land Use Patterns (Part V, Policy 1.1.3.2)

An efficient use of resources is a driving theme of the PPS. This extends to decisions regarding land use patterns including consideration of infrastructure, public service facilities, transit, and active transportation. Development must strive to minimize negative impacts to air quality, and climate change, and promote energy efficiency while avoiding the need for the unjustified and or uneconomic expansion of services.

Policy 1.1.3.2 states:

Land use patterns within settlement areas shall be based on:

a) densities and a mix of land uses which:

1. efficiently use land and resources;

2. are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion;

3. minimize negative impacts to air quality and climate change, and promote energy efficiency;

4. support active transportation;

5. are transit-supportive, where transit is planned, exists or may be developed; and

6. are freight-supportive.

Consistency of Area 1:
As addressed under Policy 1.1.1, Area 1 will utilize existing road infrastructure, enable the extension of water and wastewater servicing to existing unserviced businesses, and will provide sufficient capacity to service potential future settlement areas.

Planning for Area 1 will ensure that development within the area is transit supportive and that active transportation opportunities will be provided. As identified through the Parks and Recreation Master Plan (2020) this will include a neighbourhood park and connections to the multi-use trail network. The efficient use of land and the support for active transportation and transit users will minimize negative impacts on air quality and climate change.

New Development (Part V, Policy 1.1.3.6)

The PPS suggests that new development should occur adjacent to the existing built up area with a compact form to allow for an efficient use of resources.

Policy 1.1.3.6 states:

> *New development taking place in designated growth areas should occur adjacent to the existing built-up area and shall have a compact form, mix of uses and densities that allow for the efficient use of land, infrastructure and public service facilities.*

Consistency of Area 1:
Area 1 is in proximity to the existing built up area of the City including being adjacent to existing Highway Commercial lands along Sunset Drive. It is also contiguous with Residential land uses within the Municipality of Central Elgin and the Talbotville area in the Township of Southwold.

The addition of Area 1 to the Settlement Area allows the City to provide a mix of uses and densities that align with the long-term demand for low, medium, and high density residential across the City as a whole. In addition, Area 1 will use the existing road infrastructure and will enable the extension of municipal servicing to support existing adjacent land uses.

Phasing Policies (Part V, Policy 1.1.3.7)

The PPS requires that municipalities establish and implement phasing policies to ensure that new development within designated growth areas does not supersede intensification and redevelopment. Phasing is also required to ensure that public service facilities and infrastructure are provided in a timely and orderly manner to complement the growth.

Policy 1.1.3.7 states:

> *Planning authorities shall establish and implement phasing policies to ensure:*
>
> *a) that specified targets for intensification and redevelopment are achieved prior to, or concurrent with, new development within designated growth areas; and*

b) the orderly progression of development within designated growth areas and the timely provision of the infrastructure and public service facilities required to meet current and projected needs.

Consistency of Area 1:
The addition of Area 1 to the Settlement Area is supported by servicing and transportation studies that identify appropriate phasing for servicing. Site level opportunities for phasing development will be refined as part of a future development approvals process.

Settlement Area Expansion (Part V, Policy 1.1.3.8)

In order to permit a settlement area expansion, the PPS requires a comprehensive review addressing projected land need infrastructure and public service facilities, prime agricultural lands, minimum distance separation formulae, impacts on agricultural operations, the wise use and management of resources, and protecting public health and safety.

Policy 1.1.3.8 states:

A planning authority may identify a settlement area or allow the expansion of a settlement area boundary only at the time of a comprehensive review and only where it has been demonstrated that:

- *a) sufficient opportunities for growth are not available through intensification, redevelopment and designated growth areas to accommodate the projected needs over the identified planning horizon;*
- *b) the infrastructure and public service facilities which are planned or available are suitable for the development over the long term, are financially viable over their life cycle, and protect public health and safety and the natural environment;*
- *c) in prime agricultural areas:*
    1. *the lands do not comprise specialty crop areas;*
    2. *alternative locations have been evaluated, and*
        - *i. there are no reasonable alternatives which avoid prime agricultural areas; and*
        - *ii. there are no reasonable alternatives on lower priority agricultural lands in prime agricultural areas;*
- *d) the new or expanding settlement area is in compliance with the minimum distance separation formulae; and*
- *e) impacts from new or expanding settlement areas on agricultural operations which are adjacent or close to the settlement area are mitigated to the extent feasible.*

In determining the most appropriate direction for expansions to the boundaries of settlement areas or the identification of a settlement area by a planning authority, a planning authority shall apply the policies of Section 2: Wise Use and Management of Resources and Section 3: Protecting Public Health and Safety.

Consistency of Area 1:

Appendix A of this report outlines the process undertaken to analyse and evaluate the Potential Settlement Areas. This includes the development of evaluation criteria informed by the PPS including Policy 1.1.3.8, as well as the Transportation Technical Report, the Engineering Technical Memo, and a range of other studies which comprise the Municipal Comprehensive Review.

Area 1 can accommodate a forecasted demand for growth that cannot be accommodated through intensification, redevelopment, and existing designated growth areas within the City over the 20 year horizon as established through the Update of the Population Forecast, Housing Demand, and Residential Land Need (2018). Transportation, water, and sanitary servicing can be provided to Area 1 in an efficient manner as confirmed as part of the Transportation Technical Report and the Engineering Technical Memo. Financial viability is being assessed through the (ongoing) Development Charges Background Study. Site level opportunities to further protect and enhance the natural environment will be established as part of future development approvals processes.

Area 1 includes land classified as prime agricultural land and does not comprise specialty crop areas. As part of the Settlement Boundary Expansion Analysis, alternative potential settlement areas were evaluated. There were no reasonable alternatives to avoid prime agricultural land or lower priority agricultural lands as all of the potential settlement areas include prime agricultural lands. Area 1 was selected as the preferred area given that it is surrounded by designated urban uses through the City of St. Thomas Official Plan to the west, the Municipality of Central Elgin Official Plan to the east, and the Township of Southwold to the north. To assess the minimum distance separation requirements, an evaluation of the capability of existing barns within and adjacent to the potential settlement areas was undertaken. Any barns on lands in proximity to Area 1 that would be capable of agricultural use have already been designated for urban land uses or would be impacted by intervening urban development. Therefore no minimum distance separation is anticipated to be required.

Coordination (Part V, Policy 1.2)

The PPS encourages coordination with Aboriginal communities and adjacent planning authorities regarding planning matters. This includes encouraging coordination regarding managing growth and development, natural heritage, population and employment projections, housing needs, infrastructure, and public service facilities. The PPS also encourages planning processes that recognizes those organizations and authorities that support a comprehensive approach to planning.

Policy 1.2 includes the following provisions:

1.2.1 A coordinated, integrated and comprehensive approach should be used when dealing with planning matters within municipalities, across lower, single and/or upper-tier municipal boundaries, and with other orders of government, agencies and boards including:

a) managing and/or promoting growth and development;

b) economic development strategies;

c) managing natural heritage, water, agricultural, mineral, and cultural heritage and archaeological resources;
d) infrastructure, electricity generation facilities and transmission and distribution systems, multimodal transportation systems, public service facilities and waste management systems;
e) ecosystem, shoreline, watershed, and Great Lakes related issues;
f) natural and human-made hazards;
g) population, housing and employment projections, based on regional market areas; and
h) addressing housing needs in accordance with provincial policy statements such as the Ontario Housing Policy Statement.

1.2.2 Planning authorities are encouraged to coordinate planning matters with Aboriginal communities.

1.2.3 Planning authorities should coordinate emergency management and other economic, environmental and social planning considerations to support efficient and resilient communities.

1.2.4 Where planning is conducted by an upper-tier municipality, the upper-tier municipality in consultation with lower-tier municipalities shall:
a) identify, coordinate and allocate population, housing and employment projections for lower-tier municipalities. Allocations and projections by upper-tier municipalities shall be based on and reflect provincial plans where these exist;
b) identify areas where growth or development will be directed, including the identification of nodes and the corridors linking these nodes;
c) identify targets for intensification and redevelopment within all or any of the lower-tier municipalities, including minimum targets that should be met before expansion of the boundaries of settlement areas is permitted in accordance with policy 1.1.3.8;
d) where transit corridors exist or are to be developed, identify density targets for areas adjacent or in proximity to these corridors, including minimum targets that should be met before expansion of the boundaries of settlement areas is permitted in accordance with policy 1.1.3.8; and
e) identify and provide policy direction for the lower-tier municipalities on matters that cross municipal boundaries.

1.2.5 Where there is no upper-tier municipality, planning authorities shall ensure that policy 1.2.4 is addressed as part of the planning process, and should coordinate these matters with adjacent planning authorities.

Consistency of Area 1:

The City of St. Thomas will be consulting with local First Nations communities within southwestern Ontario on the Positioned for Growth process and the proposed settlement area expansion into Area 1. The City will focus its consultation efforts on communities with known or potential interest in the St. Thomas area. Consultation will be initiated through written and verbal communication and, if necessary, the City will follow up during the process to ensure those communications were received. The City will further include the First Nations communities in the circulation of notices of the statutory public meetings in advance of Council's consideration of the required Official Plan and zoning by-law amendments to implement the study recommendations.

Employment (Part V, Policy 1.3)

The PPS requires municipalities to promote economic development and competitiveness by providing employment lands and protecting them over the long term. The PPS permits conversion of employment lands only as part of a comprehensive review and if there is a demonstrated need for the conversion.

Policy 1.3 includes the following provisions:

1.3.1 Planning authorities shall promote economic development and competitiveness by:

a) providing for an appropriate mix and range of employment and institutional uses to meet long-term needs;

b) providing opportunities for a diversified economic base, including maintaining a range and choice of suitable sites for employment uses which support a wide range of economic activities and ancillary uses, and take into account the needs of existing and future businesses;

c) encouraging compact, mixed-use development that incorporates compatible employment uses to support liveable and resilient communities; and

d) ensuring the necessary infrastructure is provided to support current and projected needs.

1.3.2 Employment Areas

1.3.2.1 Planning authorities shall plan for, protect and preserve employment areas for current and future uses and ensure that the necessary infrastructure is provided to support current and projected needs.

1.3.2.2 Planning authorities may permit conversion of lands within employment areas to non-employment uses through a comprehensive review, only where it has been demonstrated that the land is not required for employment purposes over the long term and that there is a need for the conversion.

1.3.2.3 Planning authorities shall protect employment areas in proximity to major goods movement facilities and corridors for employment uses that require those locations.

Consistency of Area 1:
The 2018 Employment Land Review background study completed as part of this Municipal Comprehensive Review demonstrates the City's conformity with the PPS by planning for, protecting, and preserving employment areas with consideration to long term need, infrastructure, and economic competitiveness.

The background studies as part of this Municipal Comprehensive Review identified the need to convert lands currently designated as Employment within Area. Further discussion on the conversion of the employment lands within Area 1 can be found in **Section 2.2** of this report.

Housing (Part V, Policy 1.4)

The PPS requires municipalities to provide for a range and mix of housing types and densities in alignment with projected need and the regional market. This includes maintaining an available supply for a minimum of ten years and permitting and facilitating a range of housing to meet the needs of current and future residents as well as housing densities that support an efficient use of land, resources, and infrastructure.

Policy 1.4.1 includes the following provisions:

1.4.1 To provide for an appropriate range and mix of housing types and densities required to meet projected requirements of current and future residents of the regional market area, planning authorities shall:

a) maintain at all times the ability to accommodate residential growth for a minimum of 10 years through residential intensification and redevelopment and, if necessary, lands which are designated and available for residential development; and

b) maintain at all times where new development is to occur, land with servicing capacity sufficient to provide at least a three-year supply of residential units available through lands suitably zoned to facilitate residential intensification and redevelopment, and land in draft approved and registered plans.

1.4.3 Planning authorities shall provide for an appropriate range and mix of housing types and densities to meet projected requirements of current and future residents of the regional market area by:

a) establishing and implementing minimum targets for the provision of housing which is affordable to low and moderate income households. However, where planning is conducted by an upper-tier municipality, the upper-tier municipality in consultation with the lower-tier municipalities may identify a higher target(s) which shall represent the minimum target(s) for these lower-tier municipalities;

b) permitting and facilitating:

1. all forms of housing required to meet the social, health and well-being requirements of current and future residents, including special needs requirements; and

2. all forms of residential intensification, including second units, and redevelopment in accordance with policy 1.1.3.3;

c) directing the development of new housing towards locations where appropriate levels of infrastructure and public service facilities are or will be available to support current and projected needs;

d) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation and transit in areas where it exists or is to be developed; and

e) establishing development standards for residential intensification, redevelopment and new residential development which minimize the cost of housing and facilitate compact form, while maintaining appropriate levels of public health and safety.

Consistency of Area 1:

The addition of Area 1 into the Settlement Area allows the City to provide the range of housing types and densities identified as part of the forecasted market demand. Area 1 allows for the efficient use of land, infrastructure, and public service facilities. Site level opportunities for active transportation and transit have been identified through the supporting studies as part of this Municipal Comprehensive Review.

Public Spaces, Recreation, Parks, Trails, and Open Space (Part V, Policy 1.5)

The PPS encourages the promotion of healthy and active communities through planning for public spaces, recreation, parks, and trails.

Policy 1.5.1 states:

Healthy, active communities should be promoted by

a) planning public streets, spaces and facilities to be safe, meet the needs of pedestrians, foster social interaction and facilitate active transportation and community connectivity;

b) planning and providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, public spaces, open space areas, trails and linkages, and, where practical, water-based resources;

c) providing opportunities for public access to shorelines; and

d) recognizing provincial parks, conservation reserves, and other protected areas, and minimizing negative impacts on these areas.

Consistency of Area 1:

The development of Area 1 provides opportunities to promote healthy and active communities due to its proximity to community parks (Cowan Park and Athletic Park) and the future neighbourhood park identified as part of the Parks and Recreation Master Plan (2020). While currently Area 1 has limited active transportation opportunities, the Transportation Technical Report (**Appendix B**) and the Parks and Recreation Master Plan (2020) considers and identifies such opportunities including providing sidewalk, cycling infrastructure in future road design, and multi-use trails.

Infrastructure and Public Service Facilities (Part V, Policy 1.6)

The PPS requires that planning for infrastructure and public service facilities is coordinated with land use planning as well as the optimization of the use of existing infrastructure and facilities.

Policy 1.6 includes the following provisions:

1.6.1 Planning for infrastructure, electricity generation facilities and transmission and distribution systems, and public service facilities shall be coordinated and integrated with land use planning so that they are:.

a) financially viable over their life cycle, which may be demonstrated through asset management planning; and

b) available to meet current and projected needs.

1.6.2 Planning authorities should promote green infrastructure to complement infrastructure.

1.6.3 Before consideration is given to developing new infrastructure and public service facilities:

a) the use of existing infrastructure and public service facilities should be optimized; and

b) opportunities for adaptive re-use should be considered, wherever feasible.

1.6.4 Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services.

Consistency of Area 1:

The addition of Area 1 into the Settlement Area is supported by the Engineering Technical Memo, Transportation Technical Report, Parks and Recreation Master Plan (2020), and Fire Station Location Study reflecting the integration of land use planning with the provision of infrastructure and public service facilities. This includes consideration of the financial viability of infrastructure over their lifecycle which will further be supported by the City's ongoing Development Charges Background Study.

Sewage, Water, and Stormwater (Part V, Policy 1.6.6)

The PPS requires municipalities to plan for sewage and water services that accommodate projected growth in an efficient manner and that optimizes the use of existing services. The PPS identifies that municipal sewage and municipal water services are the preferred form of servicing for settlement areas. Stormwater management is directed to minimize contaminant loads, and to promote stormwater management best practices.

Policy 1.6.6 includes the following provisions:

1.6.6.1 Planning for sewage and water services shall:

a) direct and accommodate expected growth or development in a manner that promotes the efficient use and optimization of existing:

1. municipal sewage services and municipal water services; and

2. private communal sewage services and private communal water services, where municipal sewage services and municipal water services are not available;

b) ensure that these systems are provided in a manner that:

1. can be sustained by the water resources upon which such services rely;

2. is feasible, financially viable and complies with all regulatory requirements; and

3. protects human health and the natural environment;

c) promote water conservation and water use efficiency;

d) integrate servicing and land use considerations at all stages of the planning process; and

e) be in accordance with the servicing hierarchy outlined through policies 1.6.6.2, 1.6.6.3, 1.6.6.4 and 1.6.6.5.

1.6.6.2 Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas. Intensification and redevelopment within settlement areas on existing municipal sewage services and municipal water services should be promoted, wherever feasible.

1.6.6.7 Planning for stormwater management shall:

a) minimize, or, where possible, prevent increases in contaminant loads;

b) minimize changes in water balance and erosion;

c) not increase risks to human health and safety and property damage;

d) maximize the extent and function of vegetative and pervious surfaces; and

e) promote stormwater management best practices, including stormwater attenuation and re-use, and low impact development.

Consistency of Area 1

Through the evaluation of the potential settlement areas, Area 1 was identified as providing opportunities to optimize the use of existing servicing and to accommodate project growth in an efficient manner. It also provides the opportunity to upgrade servicing in existing developed areas to municipal sewage and water services. The inclusion of Area 1 within the Settlement Area will allow for existing development to be provided with municipal sewage and water services reflecting the preferred form of servicing for settlement areas. Site level opportunities for stormwater management will be identified as part of the site plan approval process.

Transportation Systems (Part V, Policy 1.6.7)

The PPS establishes that transportation systems should be safe and address projected needs and planning for transportation systems should be integrated with land use considerations. The PPS requires that existing and planned transportation infrastructure is used efficiently and that land use patterns, density, and mix of uses support transit and active transportation.

Policy 1.6.7 includes the following provisions:

1.6.7.1 Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.

1.6.7.2 Efficient use shall be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.

1.6.7.3 As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be maintained and, where possible, improved including connections which cross jurisdictional boundaries.

1.6.7.4 A land use pattern, density and mix of uses should be promoted that minimize the length and number of vehicle trips and support current and future use of transit and active transportation.

1.6.7.5 Transportation and land use considerations shall be integrated at all stages of the planning process.

Consistency of Area 1:
Area 1 allows for the utilization of the existing transportation network resulting in an opportunity to more efficiently accommodate projected growth. Integrating planning for land use and transportation, Area 1 will be supported by a road network, active transportation, and transit as identified in the Positioned for Growth: Transportation Technical Report (**Appendix B**). This includes the provision of trails and sidewalks to increase user safety.

Waste Management (Part V, Policy 1.6.10)

The PPS encourages municipalities to consider the impacts of land use patterns and development on waste management including waste generation and diversion and the provision of waste management systems that are of appropriate size and type to accommodate needs.

Policy 1.6.10.1 states:

Waste management systems need to be provided that are of an appropriate size and type to accommodate present and future requirements, and facilitate, encourage and promote reduction, reuse and recycling objectives. Planning authorities should consider the implications of development and land use patterns on waste generation, management and diversion.

Waste management systems shall be located and designed in accordance with provincial legislation and standards.

Consistency of Area 1:
Opportunities to optimize waste management for the Area 1 lands will be confirmed through the development approvals process.

Energy Conservation, Air Quality, and Climate Change (Part V, Policy 1.8)

The PPS requires municipalities to support energy efficient, reduced greenhouse gas emissions, and climate change adaptation. This is to be achieved through land use and development patterns that are compact, transit-support, and maximize vegetation in settlement areas.

Policy 1.8.1 states:

Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and climate change adaptation through land use and development patterns which:

a) promote compact form and a structure of nodes and corridors;

b) promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;

c) focus major employment, commercial and other travel-intensive land uses on sites which are well served by transit where this exists or is to be developed, or designing these to facilitate the establishment of transit in the future;

d) focus freight-intensive land uses to areas well served by major highways, airports, rail facilities and marine facilities;

e) improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion;

f) promote design and orientation which:

1. maximizes energy efficiency and conservation, and considers the mitigating effects of vegetation; and

2. maximizes opportunities for the use of renewable energy systems and alternative energy systems; and

g) maximize vegetation within settlement areas, where feasible.

Consistency of Area 1

The development of Area 1 provides opportunities for the City to promote energy efficiency and reducing greenhouse gases. Area 1 can accommodate low impact development, energy efficient building designs and minimize impact on air quality. The City should implement policies that promote best practices in energy conservation, air quality and climate change, to be implemented as part of the development approvals process. The delineation of Area 1 recognizes existing environmental features and further opportunities to maximize vegetation with the settlement area will be identified during site plan approval.

Natural Heritage (Part V, Policy 2.1)

The PPS requires municipalities to protect natural features and areas for the long term including during development and site alteration.

Policy 2.1 includes the following provisions:

2.1.1 Natural features and areas shall be protected for the long term.

2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

Consistency of Area 1

The delineation of Area 1 recognizes existing known environmental features. Site level opportunities to further protect and enhance the natural environment (e.g., development buffers, Species-at-Risk assessment) will be established as part of future development approvals processes.

Water (Part V, Section 2.2)

The PPS includes a number of provisions regarding the protection, improvement, or restoration of the quality and quantity of water. Planning authorities are required to identify surface water features, ground water features, hydrologic functions, and natural heritage features and areas which are necessary for ecological and hydrological integrity of the watershed. Development is required to implement necessary restrictions to protect drinking water supplies and designated vulnerable areas, as well as vulnerable surface and ground water.

Policy 2.2.1 states:

Planning authorities shall protect, improve or restore the quality and quantity of water by:

a) using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development;

b) minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts;

c) identifying water resource systems consisting of ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed;

d) maintaining linkages and related functions among ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas;

e) implementing necessary restrictions on development and site alteration to:

1. protect all municipal drinking water supplies and designated vulnerable areas; and

2. protect, improve or restore vulnerable surface and ground water, sensitive surface water features and sensitive ground water features, and their hydrologic functions;

f) planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality;

g) ensuring consideration of environmental lake capacity, where applicable; and

h) ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.

Consistency of Area 1:

At the time of development, a stormwater management report and Environmental Impact Study would be required to confirm the method to protect the quality and quantity of water.

Agriculture & Removal of Land from Prime Agricultural Areas (Part V, Section 2.3)

The PPS requires the protection of prime agricultural areas for the long-term use of agriculture, in the priority order of, from highest to lowest, specialty crop areas, Class 1 soils, Class 2 soils, and Class 3 soils. PPS Policy 1.1.3.8 details those characteristics and conditions that would qualify the removal of land from agricultural use.

Policy 2.3 includes the following provisions:

2.3.1 Prime agricultural areas shall be protected for long-term use for agriculture.

Prime agricultural areas are areas where prime agricultural lands predominate. Specialty crop areas shall be given the highest priority for protection, followed by Canada Land Inventory Class 1, 2, and 3 lands, and any associated Class 4 through 7 lands within the prime agricultural area, in this order of priority.

2.3.5.1 Planning authorities may only exclude land from prime agricultural areas for expansions of or identification of settlement areas in accordance with policy 1.1.3.8.

Consistency Area 1:

Area 1 is considered a prime agricultural area and does not comprise specialty crop. Consistent with Policy 1.1.3.8, as part of the Settlement Boundary Expansion Analysis, alternative locations to accommodate forecasted growth were evaluated. There were no reasonable alternatives to avoid prime agricultural land or lower priority agricultural lands. See the subsection regarding Settlement Area Expansion (Part V, Policy 1.1.3.8) for further details.

Cultural Heritage and Archaeology (Part V, Section 2.6)

The PPS requires municipalities to conserve significant built heritage resources and significant cultural heritage landscapes. The PPS also requires the protection of archaeological resources by not permitting

development on lands with such resources unless significant archaeological resources have been conserved.

Policy 2.6 includes the following provisions:

2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

2.6.2 Development and site alteration shall not be permitted on lands containing archaeological resources or areas of archaeological potential unless significant archaeological resources have been conserved.

2.6.5 Planning authorities shall consider the interests of Aboriginal communities in conserving cultural heritage and archaeological resources.

Consistency of Area 1:

No significant cultural heritage landscapes have been identified in Area 1. Before development can occur in Area 1, an Archaeological Assessment and Built Heritage & Cultural Heritage Impact Assessment will be required to confirm the presence of significant archeological resources and heritage features.

Natural Hazards (Part V, Section 3.1)

The PPS generally requires that development be directed away from land susceptible to flooding and erosion and requires municipalities to consider the potential impacts of climate change on these risks. In some situations, development and site alteration would be permitted in hazardous areas where the effects and risk to public safety are minor and where certain standards can be met.

Policy 3.1 includes the following provisions:

3.1.3 Planning authorities shall consider the potential impacts of climate change that may increase the risk associated with natural hazards.

3.1.7 Further to policy 3.1.6, and except as prohibited in policies 3.1.2 and 3.1.5, development and site alteration may be permitted in those portions of hazardous lands and hazardous sites where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards, and where all of the following are demonstrated and achieved:

a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;

b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies;

c) new hazards are not created and existing hazards are not aggravated; and

d) no adverse environmental impacts will result.

Consistency of Area 1:
In several areas, Area 1 is adjacent to lands which have flood and erosion hazard potential. At the time of development, a geotechnical analysis will be required to determine the stable top of slope and confirm development is consistent with the PPS.

Part V, Section 3.2 – Human-made Hazards

The PPS requires that development on, abutting, or adjacent to lands impacted by human-made hazards be rehabilitated or remediated, as appropriate, to address/mitigate issues or ensure no adverse effects.

Policy 3.2.2 states:

Sites with contaminants in land or water shall be assessed and remediated as necessary prior to any activity on the site associated with the proposed use such that there will be no adverse effects..

Consistency of Area 1:
Area 1 has no known human-made hazards including environmental soils contamination. To confirm conformity with the PPS and the condition of the environmental soils, a Phase 1 Environmental Site Assessment will be required in advance of development.

The expansion of the City's Settlement Area to include Area 1, and re-designation of the subject lands to accommodate residential uses, is in conformity with the policies of the PPS.

2.2 St. Thomas Official Plan (Office Consolidation January 2019)

The development of Area 1 for residential uses conforms to the overall policy framework of the Official Plan, which promote long term planning for housing needs, provision of public services and infrastructure, and protecting and preserving the environment. However, an Official Plan Amendment is required to expand the City's Settlement Area to include Area 1 and re-designate the Area 1 lands Residential. The proposed amendment to the City of St. Thomas Official Plan is presented in **Appendix D**

Area 1 includes lands designated Employment in the City of St. Thomas Official Plan. The following policies were considered in evaluating the conversion of these lands to accommodate residential uses.

Employment Land Supply and Conversions (Policies 5.1.10.3.1 and 5.11.4)

The Official Plan includes provisions regarding maintaining an adequate supply of employment lands to 2037 as well as criteria for conversion. A conversion from an employment to a non-employment use must occur as part of a comprehensive review and meet a series of conditions including: that the subject lands are not required over the long term; the overall viability of the employment area will not be adversely affected; there are land use compatibility issues with the site constraining the potential for employment uses; infrastructure will be able to accommodate the conversion; and the conversion would be in conformity with the goals of the Official Plan.

Policy 5.10.3.1 states:

The City will maintain an adequate supply of lands designated for employment purposes to accommodate employment growth to the year 2037. Key land supply priorities include:
i) maintaining an adequate supply of serviced and serviceable land, recognizing variations in development requirements;
ii) providing a variety of choice in terms of location, property size and configuration, cost, and the range of permitted uses;
iii) ensuring an efficient configuration of employment areas in terms of road networks, property shapes and sizes;
iv) providing infrastructure and infrastructure improvements;
v) monitoring the rate of employment growth and the supply of employment lands to ensure that sufficient lands are designated to meet employment growth targets and the needs of existing and new businesses.

Policy 5.11.4 includes the following provisions:

5.11.4.1 The City may only permit the conversion of lands within an "Employment" area to non-employment uses through a comprehensive review of the official plan as defined in the Provincial Policy Statement in effect at the time.

5.11.4.2 Requests for conversion of employment land shall be assessed applying the following criteria:
i) it has been demonstrated that the land is not required over the long term for employment purposes;
ii) there is a need for the conversion as established by the municipal comprehensive review;
iii) the conversion will not adversely affect the overall viability of the employment area
iv) the conversion will not create incompatibilities with adjacent land uses or impact the ability of adjacent lands or development to be used or continue to be used for employment purposes;
v) the site is constrained for traditional industrial development because of land use compatibility issues with adjacent sensitive non-employment land uses;
vi) infrastructure exists or is planned to accommodate the proposed conversion
vii) the conversion would be in conformity with the goals of the official plan.

Compliance of subject lands:

Area 1 includes a triangular-shaped portion of lands north of Major Line which are currently designated as Employment in the City of St. Thomas Official Plan (the subject lands). The subject lands are vacant, adjacent to existing agricultural uses to the north and south, and commercial uses along Sunset Drive to the west. The adjacent designated land uses include Industrial to the north (Southwold Township), Residential to the east and west (Southwold and Central Elgin), Highway Commercial to the west, and Rural to the south (St. Thomas). As part of this Positioned for Growth study, the lands north of Major Line within Area 1 are proposed to be designated as Residential.

The lands designated as Employment within Area 1 are appropriate for conversion to non-employment as it complies with the criteria for conversion in the City's Official Plan:

- The conversion is occurring through a comprehensive review of the Official Plan.
- There is a demonstrated need for the conversion. The 2018 Update of the Population Forecast, Housing Demand, and Residential Land Need identified a need for an additional 76 gross hectares of land to meet the forecasted market demand for residential uses to 2041. The Positioned for Growth Study recommended Area 1 as the preferred land to accommodate this growth (see Section 2.0 of this report for evaluation process and results).
- The subject lands are not required over the long term for employment uses. The 2018 Employment Land Review established employment growth projections for the City to 2037 and reviewed and assessed the ability of the Employment supply to accommodate this growth. The supply and demand analysis identified an overall supply deficit (51 hectares), and highlighted additional limitations within some of the land supply that would restrict the ability to accommodate the 2037 demand (see **Figure 3**). The subject lands designated Employment within Area 1 were identified as having additional constraints that limit the ability of the lands to contribute to the long term employment land demand. This included the configuration of the site and potential for land use incompatibilities with adjacent lands. It was also identified in the 2018 Employment Land Review that the subject site be considered for conversion in the future when full services are available. Therefore, these lands were identified as not being required over the long term for employment uses.
- Conversion of the subject lands would not adversely affect the viability of the employment area. The subject lands are disconnected from the primary designated employment area located in the north-east area of the City.
- Conversion of the subject lands will not create land use incompatibilities with adjacent lands. The subject site is in proximity to existing and planned Residential uses within the Municipality of Central Elgin, the Township of Southwold, the City of St. Thomas and adjacent to Highway Commercial lands in the City of St. Thomas and vacant Employment lands within the Township of Southwold. Conversion of these lands to Residential mitigates the potential for land use compatibility issues with the adjacent Residential lands. The rail corridor can be used as a buffer to mitigate and potential impacts to the vacant employment lands in the Township of Southwold.
- Infrastructure is planned to accommodate the conversion of the subject site. The servicing and transportation studies completed as part of this Municipal Comprehensive Review ensures that infrastructure is planned to accommodate the proposed conversion to a Residential designation, please see **Appendix B and C** for more information.
- The conversion is in conformity with the goals of the Official Plan. The applicable goals include: providing a sufficient supply of residential lands serving the market demand for housing type, density, unit size, etc. (Policy 5.1.2); and providing and maintaining a sufficient supply of land to accommodate employment growth (Policy 5.10.2).

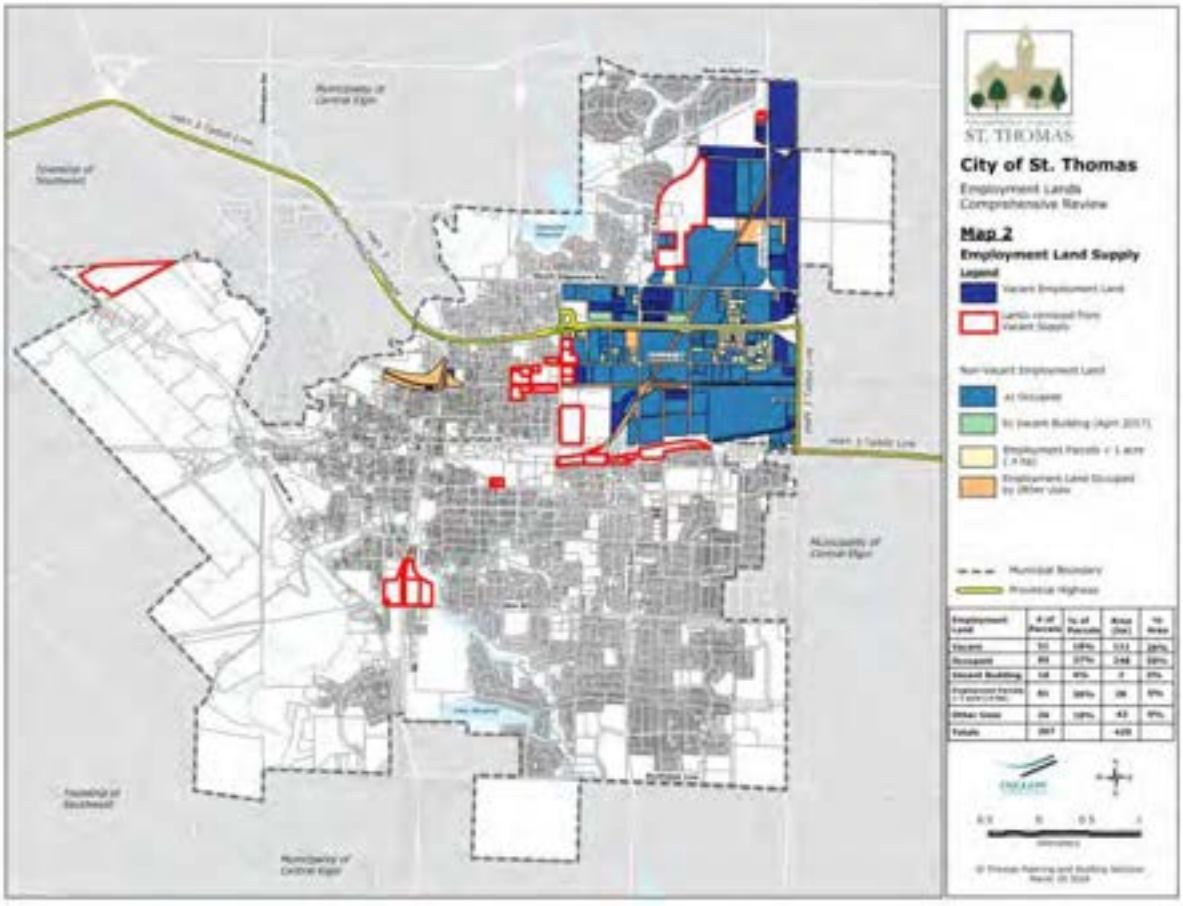


Figure 4: Parcels with Additional Supply Limitations as Identified in the 2018 Employment Lands Review

Environment (Policy 8.3.2)

In addition to the Employment policies, the Environment policies are important to examine as to how they are applied to the Area 1 lands. The Official Plan includes a number of provisions to protect, conserve, and mitigate negative impacts on lands designated as Natural Heritage within the Official Plan. One provision identifies that an Issues Scoping Report/Environmental Impact Study may be required where development and/or site alternative is proposed on lands within 120 metres of lands designated Natural Heritage.

Policy 8.3.1 states:

8.3.3.1 Where development and/or site alteration is proposed on lands within 120 metres of an area designated as Natural Heritage on Schedule "A" Land Use Plan, the proponent may be required to:

i) prepare in accordance with the policies of subsection 8.3.4 of this Plan, an Issues Scoping Report (ISR) and an Environmental Impact Study (EIS), if warranted by the ISR, that evaluates the ecological functions of the lands proposed for development or site alteration and demonstrates that there will be no negative impacts on the natural heritage features or on their ecological functions.

ii) where new development or site alteration is proposed that would change the use(s) or the density or intensity of development within lands that have already been the subject of an EIS, an addendum to the EIS shall be prepared in accordance with the policies of subsection 8.3.4 to demonstrate that there will be no negative impacts on the natural heritage features or on their ecological functions as a result of a change in the density, intensity or use(s).

iii) the City may seek advice from the local conservation authority and/or other relevant agencies in determining if there will be no negative impacts on the natural heritage features or on their ecological functions.

iv) the City may, at the expense of the proponent, require an independent peer review of documents and studies submitted in support of development or site alteration under subsection 8.3.4.

Compliance of subject lands:
At the time of development, an Issues Scoping Report/Environmental Impact Study will be completed to demonstrate that there will be no negative impact on natural heritage features or their ecological functions.

The expansion of the Settlement Area to include Area 1, the conversion of lands designated Employment within Area 1 and the re-designation of the Rural lands to Residential complies with the policy framework established in the Official Plan and the alignment with OP policies will be strengthened through the OPA.

2.3 St. Thomas Zoning By-law (50-88)

Currently within the City of St. Thomas zoning by-law, Area 1 is predominantly zoned Residential Development Zone - R7. This zone permits no land, building or structure shall be used except for the purpose of agriculture or uses existing at the date of the passing of the by-law. The lands north of Major Line are zoned Employment Lands (EL). The remaining land is zoned Natural Heritage (NH), which permits no land, building or structure to be used except for the purpose of conservation of the natural environment or forest, wildlife and fisheries management.

To be consistent with the proposed Official Plan Amendment, a Zoning By-law Amendment is required. The proposed amendment to the St. Thomas Zoning By-law is presented in **Appendix E**.

3.0 Conclusions

In conclusion, the expansion of the Settlement Area to include Area 1 and the re-designation of the subject lands from Rural and Employment to Residential in the City of St. Thomas Official Plan represents good planning. This includes the findings that:

- Sufficient opportunities for growth are not available through intensification, redevelopment and designated growth areas to accommodate the projected needs over a 20 year horizon and that a settlement area expansion is required;
- There are no alternatives for settlement area expansions through which to avoid prime agricultural lands and there are no reasonable alternatives on lower priority agricultural lands within prime agricultural areas;
- The expanded settlement area is in compliance with the minimum distance separation formula and the impacts on adjacent or close by agriculture operations can be mitigated to the extent possible;
- The expansion of the Settlement Area to include Area 1 is consistent with the Provincial Policy Statement;
- The re-designation of the subject lands to Residential is in conformity with the Provincial Policy Statement;
- The extension of servicing to Area 1 provides broader benefit to unserviced Highway Commercial lands along Sunset Drive and the ability to size appropriately to accommodate future growth in Area 2 and 3;
- The development of Area 1 would utilize existing capacity in the municipal road system; and
- The existing and planned infrastructure and public service facilities are suitable for the development over the long term and provide an opportunity to extend municipal services to existing land uses.

3.1 Recommendations and Next Steps

Based on the results of the Phase 1 and 2 analysis, it is recommended to:

1. **Adjust the Settlement Area boundary within the Official Plan to include Area 1**. As outlined in the OPA (**Appendix D**), it is recommended that the Settlement Area boundary be adjusted to include Area 1.
2. **Designate Area 1 as Residential within Official Plan Schedule A.** As outlined in the OPA (**Appendix D**) and illustrated in **Schedule A** in the appendix, it is recommended that Area 1 be designated as Residential and subject the applicable Official Plan policies.
3. **Update Zoning Bylaw to Convert the Employment Lands in Area 1 to Residential**: As outlined in the ZBA (Appendix E), it is recommended that the lands northeast of Major Line and Sunset Boulevard that are currently zoned Employment Land be converted to Residential.

4. **Update the Development Charges study for infrastructure as required.** The technical memos for transportation and engineering (sanitary, water, and storm servicing) outline infrastructure costs that should be incorporated into the development charges study.
5. **As part of the next phase of settlement area expansion (Phase 3), undertake a Block Plan of Subdivision for Area 1.** Complete detailed support studies as required such as Natural Heritage/Environmental Impact Study, Geotechnical Study, Archaeological Assessment, and Built Heritage & Cultural Heritage Impact Assessment as part of the requirements to support a Block Plan of Subdivision.
6. **As part of the next phase of settlement area expansion (Phase 3), establish a developer/landowners group to encourage coordination and ease of development.** Area 1 includes four pieces of land in separate ownership with access needs which will require some assembly of land or coordination. The City should establish a developer/landowners group to encourage ease of development.

Appendix A

Settlement Boundary Expansion Analysis

A1.0 Settlement Boundary Expansion Analysis

This appendix to the Planning Justification Report documents the process undertaken to select the area preferred for settlement boundary expansion. This begins with a process overview, followed by a description of the potential settlement areas, the policy context setting the framework for the analysis, the methodology, the analysis results, and the proposed settlement area expansion.

A1.1 Process Overview

The Positioned for Growth Study was completed in two phases: (1) evaluation of alternatives, and (2) preferred alternative and documentation as part of a Municipal Comprehensive Review. This appendix provides details for Phase 1.

Public and stakeholder engagement was undertaken during both phases of the process, and a Steering Committee of City staff representatives was initiated to guide the process and deliverables of the assignment. Consultation materials have been included in **Attachment 1**. The public and stakeholder engagement activities included:

- **Public Event #1**: Coffee Conversations was held in May 2019 and provided an informal setting for the public to give input on the evaluation criteria for the settlement boundary expansion analysis and on the opportunities or issues within each of the Four Potential Settlement Areas.
- **Reference Committee Meeting**: On June 17, 2019, the Reference Committee was presented with the preliminary results of the evaluation including the preferred area. Approval was given to proceed with Area 1 as the preferred area and complete the documentation to conclude phase 2 of the PFG study.
- **Landowner Meeting:** A meeting with landowners of the Four Potential Settlement Areas was held on July 8, 2019 to review the evaluation assessment and obtain feedback on the preferred area recommendation.
- **Public Event #2:** An open house was held on July 8, 2019 to share the evaluation assessment and obtain feedback on the preferred area recommendation.

A1.2 Description of Potential Settlement Areas

Four Potential Settlement Areas were assessed to accommodate residential growth to 2041. These four Potential Settlement Areas, as shown in **Figure A1**, are the remaining lands within the City limits that can be made available to accommodate residential settlement area expansion and are currently not designated for urban use within the City's Official Plan. The Potential Settlement Areas are all separated from to the existing built area of St Thomas due to natural heritage features within the western area of the municipality. An additional description of each of the four areas is presented below.

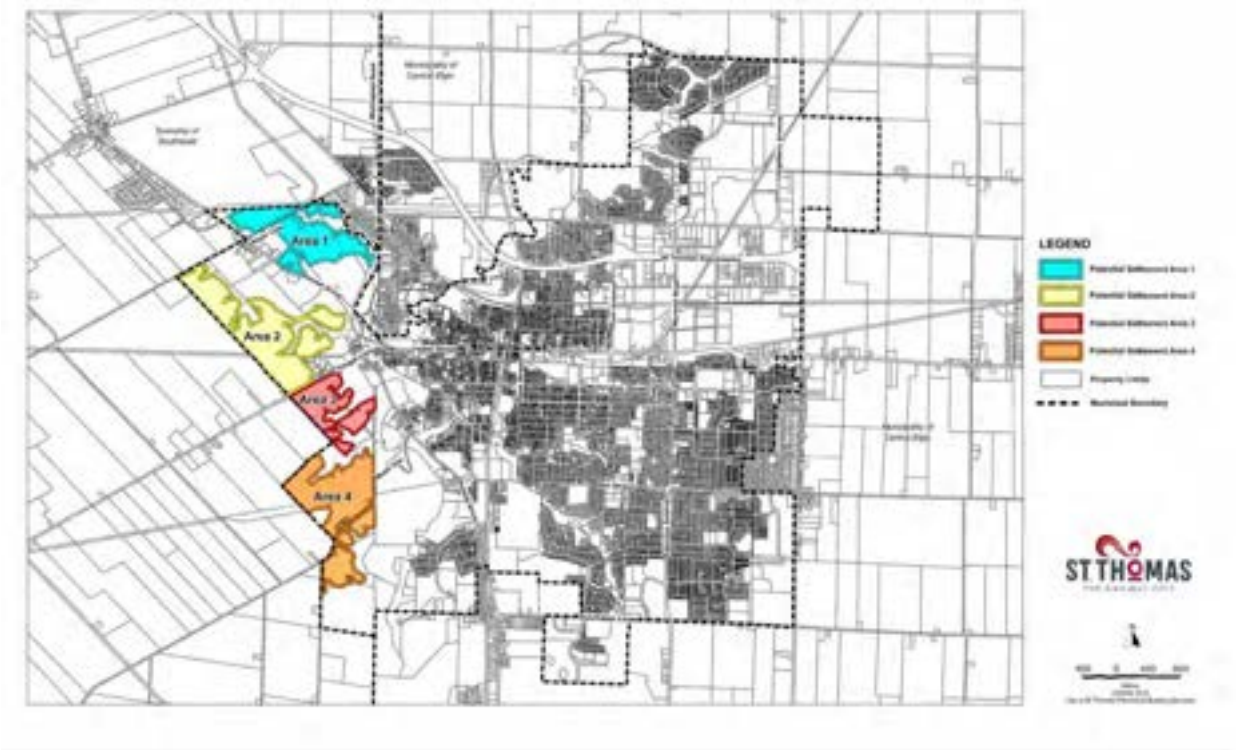


Figure A1: Positioned for Growth Study Area – Potential Settlement Areas

Area 1

Area 1 comprises 63 net hectares of land designated as Rural Area and Employment lands and located north of Sunset Drive and west of Wellington Road. The lands are in proximity to existing built up areas including the Lynhurst neighbourhood within the Municipality of Central Elgin, Talbotville in the Township of Southwold and Highway Commercial lands located along Sunset Drive. The lands are also bordered and partially fragmented by natural heritage features. The area is comprised of prime agricultural land. The existing land use in Area 1 is primarily agricultural with a potential livestock operation in the northeast quadrant with another just outside of the area.

Area 2

Area 2 is 101 net hectares of land designated as Rural Area and is located south of Sunset Drive and north of Fingal Line. The lands are bordered by and fragmented by natural heritage features to the east and is in in close proximity to the existing built up area designated as Residential on Munro Avenue. The topography of the area includes steep hills in the east. The area is comprised of prime agricultural land The existing land use in Area 2 is primarily agricultural with a potential livestock operations and barns within the north end of the area and others just outside of the area along Fingal Line.

Area 3

Area 3 is 39 net hectares of land designated as Rural Area and is located south of Fingal Line and west of Sunset Drive. The lands are bordered by natural heritage features to the east and is in close proximity to the existing built up area designated as Residential on Munro Avenue. The area is comprised of prime agricultural land The existing land use in Area 3 is primarily agricultural with barns having the potential to house livestock within the area and other just outside of the area along Fingal Line.

Area 4

Area 4 is 88 net hectares of land designated as Rural Area and is located west of Sunset Drive and north and south of Bush Line. The lands are adjacent to vacant lands currently designated as Residential to the east and is otherwise bordered and fragmented by natural heritage features. The area is comprised of prime agricultural land. The existing land use in Area 4 is primarily agricultural with potential livestock operations and barns within the area and outside of the area.

A1.3 Policy Context

Settlement boundary expansions within the City of St. Thomas are subject to the policies of the Provincial Policy Statement (PPS) and the City of St. Thomas Official Plan (OP). The following sections summarize the relevant policies that guide settlement boundary expansion processes and presents how the policies have been applied to this study.

A1.3.1 Provincial Policy Statement

The 2014 Provincial Policy Statement (PPS) outlines specific requirements for municipalities when seeking to conduct a settlement Area boundary expansion. Section 1.1.3.8 of the PPS requires that a settlement area boundary expansion can only be undertaken as part of a comprehensive review of the Official Plan and sets out additional requirements that must be met:[1]

"A planning authority may identify a *settlement area* or allow the expansion of a *settlement area* boundary only at the time of a *comprehensive review* and only where it has been demonstrated that:

a) sufficient opportunities for growth are not available through *intensification*, *redevelopment* and *designated growth areas* to accommodate the projected needs over the identified planning horizon;
b) the *infrastructure* and *public service facilities* which are planned or available are suitable for the development over the long term, are financially viable over their life cycle, and protect public health and safety and the natural environment;
c) in *prime agricultural areas*:
    3. the lands do not comprise *specialty crop areas*;
    4. alternative locations have been evaluated, and

[1] In July 2019, the Province released proposed amendments to the Provincial Policy Statement to reflect other recent changes including those of the approved Growth Plan, 2019. The proposed changes are open to public comment until October 21, 2019. This planning justification report is based on the in force and in effect PPS (2014).

iii. there are no reasonable alternatives which avoid *prime agricultural areas*; and
iv. there are no reasonable alternatives on lower priority agricultural lands in *prime agricultural areas*;

d) the new or expanding *settlement area* is in compliance with the *minimum distance separation formulae*; and
e) impacts from new or expanding *settlement areas* on agricultural operations which are adjacent or close to the *settlement area* are mitigated to the extent feasible.

In determining the most appropriate direction for expansions to the boundaries of *settlement areas* or the identification of a *settlement area* by a planning authority, a planning authority shall apply the policies of Section 2: Wise Use and Management of Resources and Section 3: Protecting Public Health and Safety."

These policies were used to establish the process and criteria to evaluate the Potential Settlement Areas in St. Thomas. **Section 1.3.3** (Policy Application) of this Appendix describes how each element of this policy has been addressed by the City.

In addition to the PPS policies specific to Settlement Area Expansion as outlined above, a number of other policies informed the settlement boundary expansions analysis including: managing and directing land use to achieve efficient and resilient development and land use patterns (Policy 1.1); coordination (1.2); housing (1.4); public spaces, recreation, parks, trails and open space (1.5); infrastructure and public service facilities (1.6); energy conservation, air quality, and climate change (1.8); natural heritage (2.1); water (2.2); agriculture (2.3); minerals and petroleum (2.4); mineral aggregate resources (2.5); cultural heritage and archaeology (2.6); natural hazards (3.1); and human-made hazards (3.2). **Section 1.3.3 of this Appendix** demonstrates how the Positioned for Growth Study and the City's other background studies have been undertaken to confirm to the Provincial Policy Statement.

A1.3.2 St. Thomas Official Plan

Within the City's Official Plan, the four Potential Settlement Areas are currently designated as Rural Area. Permitted uses within the Rural Area designation includes existing farm operations and buildings and structures essential to the operations including residences, barns, and other buildings supporting the farm operations. The policies currently do not permit new livestock operations within the Rural Area.

The City of St. Thomas Official Plan must be consistent with the PPS. This includes the provision of policies related to settlement area expansion. The four Potential Settlement Areas are subject to Section 5.15 Rural Area of the St. Thomas OP which establishes criteria for settlement area expansion.

Section 5.15.3.7 of the Official Plan states:

"Expansion of the St. Thomas Urban Service Area onto prime agricultural lands shall be considered based on the following criteria:

ii. necessity for the land use change based on 20 year demand and growth projections;

iii. amount of land supply required to accommodate the 20 year growth projections, taking into consideration the amount of vacant land already designated for the proposed use and potential for infilling or development; and

iv. rationale for the choice of location including alternative locations that avoid prime agricultural land, alternative locations of lower capability agricultural lands in prime agricultural areas, viability of the parcel for agriculture, logical extension and/or rounding out of the existing community, land use compatibility, physical site suitability, adequacy of hard services, availability of municipal services, mitigation of impacts on surrounding agricultural operations based Minimum Distance Separation requirements, impact on aggregate resources and environmental impacts."

The next appendix **Section 1.3.3** describes how these policies have been applied to inform the Positioned for Growth study.

A1.3.3 Policy Application

The Provincial and municipal policy context requires that a settlement area expansion be only considered as part of a municipal comprehensive review (MCR). The Positioned for Growth study is being undertaken as part of the City's municipal comprehensive review study to review and update its Official Plan to accommodate growth to 2041. The City has undertaken a number of background studies and analysis to support the City of St. Thomas' MCR, a full list of these studies, including this Positioned for Growth study, is included in **Table 1**. These background studies have been undertaken to inform the evaluation of the Potential Settlement Areas, as described in the following section.

Table A1: Studies Undertaken to Support the City of St. Thomas' Municipal Comprehensive Review

Study	Prepared By	Policy Addressed	Description
Retail Market Study (2016)	Dillon Consulting with W. Scott Morgan and Associates	Intensification and redevelopment opportunities and physical constraints within built area boundary (1.1.3.8(a))	Undertaken in 2016 to review the citywide retail supply and demand. The study identified that the majority of the retail market demand could be accommodated by the existing vacant supply.
Employment Lands Review (2018)	Dillon Consulting with Watson and Associates Economists Ltd.	Population and employment projections and alternative direction for growth (1.1.3.8(a)) Intensification and redevelopment opportunities and physical constraints within built area boundary (1.1.3.8(a))	Updated employment projections for the City of St. Thomas to 2037 and assessed the alignment of land supply with the forecasted demand. Identified and considered opportunities for intensification and

Study	Prepared By	Policy Addressed	Description
		St. Thomas OP Policy 5.15.3.7	infill for employment uses, as well as physical constraints within the built area (e.g., land use compatibility, contaminated sites, etc.)
Long Term St. Thomas-Elgin Affordable Housing Strategy (2018)	Tim Welch Consulting	Population and employment projections and alternative direction for growth (1.1.3.8(a))	Assessed needs related to affordable housing within the City and as alternative directions for growth.
Update of the Population Forecast, Housing Demand, and Residential Land Need (2018)	Dillon Consulting with Watson and Associates Economists Ltd.	Population and employment projections and alternative direction for growth (1.1.3.8(a)) Intensification and redevelopment opportunities and physical constraints within built area boundary (1.1.3.8(a)) St. Thomas OP Policy 5.15.3.7	Updated population projections for the City of St. Thomas to 2041 and assessed the alignment of land supply with the forecasted demand. Identified and considered opportunities for residential intensification and infill.
Positioned for Growth: Planning Justification Report (2019)	Dillon Consulting	Assess alternative locations and reasonable alternatives on lower priority agricultural lands (1.1.3.8(c)) Compliance with minimum distance separation formulae (1.1.3.8.(d)) Mitigate impacts on agricultural operations (1.1.3.8(e)) PPS Section 2: Wise Use and Management of Resources PPS Section 3: Protecting Public Health and Safety St. Thomas OP Policy 5.15.3.7	Assessed potential settlement boundary expansion areas with consideration to prime agricultural lands, the minimum distance separation formulae, and impacts on agricultural operations. Evaluation and justification considered and applied applicable sections of the PPS including Section 2 and 3.
Positioned for Growth: Transportation Technical Report (2019)	Dillon Consulting	Infrastructure is suitable for the development over the long term (1.1.3.8.(b))	Identified long term transportation infrastructure needs including for road, transit, and active transportation.

Study	Prepared By	Policy Addressed	Description
Positioned for Growth: Engineering Technical Memo (2020)	Dillon Consulting	Infrastructure is suitable for the development over the long term (1.1.3.8.(b))	Identified long term municipal servicing needs related to water and sanitary servicing.
Positioned for Growth: Parks and Recreation Master Plan (2020)	Dillon Consulting with Monteith Brown Planning Consultants	Public service facilities are suitable for the development over the long term (1.1.3.8.(b))	Identifying opportunities to provide parks and recreation services over the long term.
Positioned for Growth: Fire Station Location Study (underway)	Dillon Consulting	Public service facilities are suitable for the development over the long term (1.1.3.8.(b))	Identifying strategies to provide fire protection services over the long term.
St. Thomas Development Charges Background Study (underway)	Watson and Associates	Financial viability over the full life cycle of assets (1.1.3.8(b))	Assessing financial impacts of and planning for the anticipated growth.

A1.4 Methodology and Evaluation Criteria

In order to assess the four Potential Settlement Areas, evaluation criteria was developed to address the requirements of the PPS and incorporate community and stakeholder input. The following themes were identified and a full list of evaluation criteria have been included in **Attachment 2**:

1) Proximity To Existing Built-Up Area
2) Proximity To Other Planned Areas Facilities, Parks & Open Spaces
3) Land Use Compatibility
4) Housing
5) Ease Of Development
6) Natural Heritage
7) Surface & Groundwater
8) Agricultural Impacts
9) Mineral & Petroleum Resources
10) Cultural Heritage & Archaeology
11) Natural Hazards

12) Human-Made Hazards
13) Transit And Active Transportation
14) Road Improvements
15) Water Improvements
16) Sanitary Sewer System
17) Emergency Services
18) Air Quality And Climate Change
19) Overall Capital Costs
20) Cross Jurisdictional

The criteria were used to evaluate the four Potential Settlement Areas shown in **Figure A1**. To support the evaluation, the consulting team identified infrastructure requirements and capital costs based on a preliminary analysis and order of magnitude cost estimates. The assessment results are discussed in **Section 1.5**.

A1.5 Potential Settlement Expansion Area Analysis Results Summary

This section presents a summary of the evaluation of the four Potential Settlement Areas. A series of maps illustrating existing conditions regarding transportation, natural heritage, agriculture, etc., were generated to inform the analysis. These figures can be found in **Attachment 3**. The complete results of the evaluation process are presented in **Attachment 4** and the Transportation and Engineering Technical Memos have been included in **Appendix B** and **C** of the Planning Justification Report**.** In completing the analysis, several evaluation criteria themes did not have significant variations when applied to the four Potential Settlement Areas.[2] A summary of the Potential Settlement Area analysis results is provided below.

Area 1

- Area 1 comprises 63 net hectares and could accommodate approximately 1,390 residential units or 2,340 people resulting in sufficient area to accommodate the demand to 2041.
- Area 1 is in proximity to not contiguous with the existing built area of St. Thomas and would require an extension of municipal infrastructure.
- Due to its proximity to Highway Commercial uses along Sunset Drive and Lynhurst neighbourhood in the Municipality of Central Elgin Talbotville area in the Township of Southwold, Area 1 is preferred from the perspective of proximity to the built up area and other facilities.

[2] These criteria were: Land Use Compatibility, Ease of Development, Natural Heritage, Surface and Groundwater, Mineral and Petroleum Resources, Cultural Heritage and Archaeology, Natural Hazards, Human Made Hazards, Transit and Active Transportation, Emergency Services, Air Quality and Climate Change, and Cross Jurisdictional.

- Area 1 is surrounded by Natural Heritage features to the south, east and west of the three areas of land designated Rural Areas south of Major Line. The lands north of Major Line have limited Natural Heritage features identified that will require a buffer.
- Area 1 includes several parcels of land, in varying sizes and separate ownerships; with access needs and/or some assembly of land or coordination among owners will be required. The rail corridor and the two hydro corridors that may require buffers/setbacks.
- Based on preliminary analysis, the potential livestock operations in Area 1 are not likely to require minimum distance separations. Area 1 is preferred from the perspective of agricultural impacts as it is surrounded by lands designated for urban or natural heritage/natural hazard land uses.
- Based on order of magnitude costs, Area 1 is least preferred for wastewater servicing, most preferred for water improvements, and most preferred for road improvements.
- The extension of municipal servicing to Area 1 will have a broader benefit to lands along Sunset Drive, which will be able to connect to municipal servicing. In addition, municipal servicing could be sized to accommodate future growth in Areas 2 and 3.

Area 2

- Area 2 is 101 net hectares and could accommodate 2,224 residential units or 3,750 people resulting in sufficient area to accommodate the demand to 2041.
- Area 2 is not contiguous with the existing built area of St. Thomas and would require an extension of infrastructure.
- Area 2 is surrounded by Natural Heritage features to the east. Several areas of land may be a challenge to access while avoiding Natural Heritage features and their buffers.
- Area 2 includes a former rail corridor with different ownership bisecting the lands, several areas that have narrow or no access options without impacting the natural heritage system and steep topography to the east.
- Area 2 includes an existing active livestock operations and potential MDS concerns onlands adjacent to the area along Fingal Line, based on preliminary analysis, is likely to require a minimum distance separation and other mitigation measures to manage land use conflict. This could limit the availability of land being considered for the settlement area expansion.
- Based on order of magnitude costs, Area 2 is least preferred for road improvements and neutral/midrange for water improvements and sanitary servicing.
- The extension of municipal servicing to Area 2 can be sized to accommodate future growth in Area 3.

Area 3

- Area 3 is 39 net hectares resulting in insufficient area to accommodate the demand to 2041. It could accommodate 859 residential units or 1,448 people. Area 3 is least preferred from the perspective of housing.
- Area 3 is not contiguous with the existing built area of St. Thomas and would require an extension of infrastructure.
- Area 3 is surrounded by Natural Heritage features to the east and south. One area may be a challenge to access while avoiding Natural Heritage features and their buffers.
- Area 3 includes several areas that have narrow access options without impacting the natural heritage system and the developable area is constrained by presence of natural heritage features.
- Area 3 includes an existing barn with a potential to house livestock and potential MDS concerns on lands adjacent to the area along Final Line, which, based on preliminary analysis, is likely to require a minimum distance separation and other mitigation measures to manage land use conflict. This could limit the availability of land being considered for the settlement area.
- Based on order of magnitude costs, Area 3 is preferred for road improvements, and neutral/midrange for water improvements and sanitary servicing.
- The extension of municipal servicing to Area 3 can be sized to accommodate future growth in Area 2.

Area 4

- Area 4 is 88 net hectares and could accommodate 1,938 residential units or 3,267 people resulting in sufficient area to accommodate the demand to 2041.
- Area 4 is not contiguous with the existing built area of St. Thomas and would require an extension of infrastructure.
- Area 4 is surrounded by Natural Heritage features to the east, north and south. Several areas may not be feasible for development due to remaining amount of land once buffers are applied.
- Area 4 includes a former rail corridor with different owner bisecting the lands, possible environmental soils constraints, as well as four separate pieces of land in multiple ownership with access needs and some land assembly required.
- Impacted by minimum distance separation requirements due to proximity to the City's existing Wastewater Treatment Plant on Bush Line and Sunset Drive.
- Based on order of magnitude costs, Area 4 preferred for sanitary servicing and least preferred for road improvements, and water improvements.
- Area 4 includes existing buildings which may have a potential to house livestock, which, based on preliminary analysis, is likely to require a minimum distance separation and other mitigation measures to manage land use conflict. This could limit the availability of lands being considered for the settlement area.

A1.6 Preferred Settlement Area Expansion

Based on the high-level evaluation of the four areas, Area 1 has been identified as the preferred area, as it:

- Is in proximity to the existing built area and the most continuous with the existing community.
- Utilizes the City's existing road network and capacity.
- Provides good access to Highway 401, London, adjacent communities and Downtown.
- Would support the extension of servicing to the Highway Commercial Lands along Sunset Drive.
- Municipal servicing could be oversized to accommodate Area 2 and 3 in the future.
- Presents the least impact on agricultural lands.

The body of the Planning Justification Report presents a detailed analysis and justification for the expansion of the settlement area and land use designation change for Area 1. The associated infrastructure and transportation requirements are included in **Appendix B and C**.

Attachment A1

Consultation Materials

DILLON CONSULTING

Coffee Conversations

DILLON CONSULTING

Evaluation of Settlement Expansion Areas

We will be using the following criteria to assess the four potential Settlement Expansion Areas:

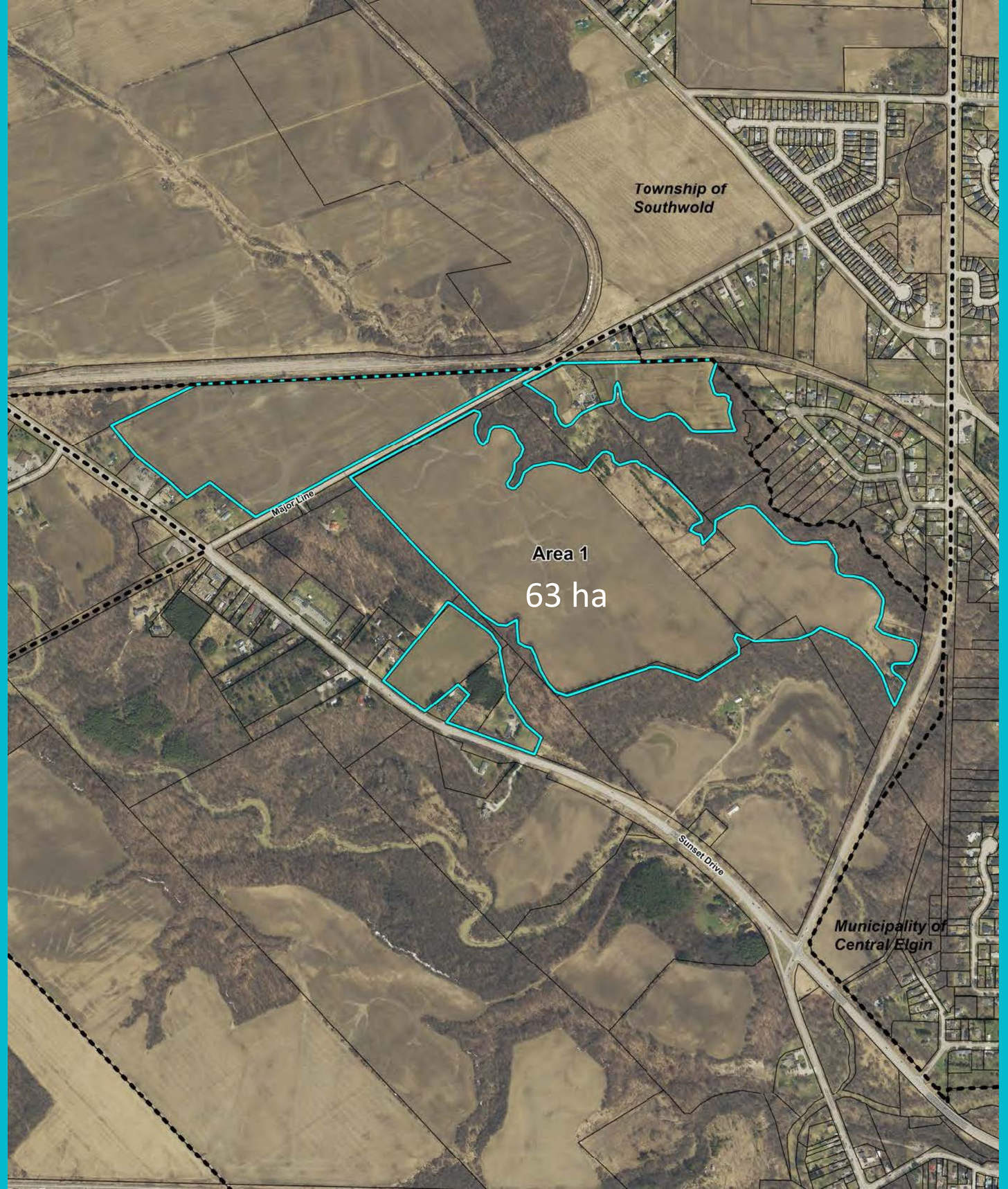
1. **Proximity to existing built-up areas?**
   (Efficient use of land, infrastructure, and public services)
2. **Proximity to work/live/play connections?**
   (Employment, recreation, and other existing or planned facilities)
3. **Separated from industries and other major facilities?**
   (Adverse environmental effects and risks to public health/safety)
4. **Sufficient residential land for future growth?**
5. **Constraints impacting development opportunities?**
6. **Buffering of development from natural heritage areas?**
   (*Significant natural features, species at risk)*
7. **Potential for disturbances to water resources?**
   (Sensitive and/or vulnerable surface water and groundwater)
8. **Potential to impact local agriculture?**
   (Avoidance of prime agricultural land, proximity to active livestock operations)
9. **Subject to flooding, erosion or other natural hazards?**
10. **Expansion area contains:**
    a) **Mineral or petroleum resources?**
    b) **Significant cultural heritage landscapes?**
    c) **Human-made hazards?**
       (Such as environmental soil contamination?
11. **Efficiently serviced by:**
    a) **Existing or future/planned transit service?**
    b) **Existing road network?**
    c) **Municipal water services?**
    d) **Municipal sewage services?**
12. **Efficient delivery of emergency services?**
13. **Minimizes impacts to air quality and climate change, and/or promotes energy efficiency?**
14. **Capital costs associated with servicing area?**
    (Order of magnitude costs)
15. **Cross-jurisdictional issues and opportunities?**

Have we missed anything? Leave us your feedback below.

ST. THOMAS
THE RAILWAY CITY

OPPORTUNITIES

- Vacant lands adjacent to existing developed area
- Good connectivity to existing urban area, employment area to the north, London and Highway 401
- Close proximity to existing water distribution system (incl. St. Thomas Area Secondary Distribution Supply System)
- Existing Highway Commercial lands to the west could be serviced simultaneously
- Downstream sanitary servicing could be designed to also accommodate Area 2 and Area 3, should they be developed in future
- Access to Sunset Drive, Wellington Road, and Major Line
- County / arterial roads could be expanded/upgraded if necessary
- Good potential for active transportation corridor along rail corridor to the north
- Good opportunity for extension of transit service and could service Lynhurst neighbourhood



CONSTRAINTS/ISSUES

- Floodplain features located to the south
- Four pieces of land in separate ownerships to be developed
- Adjacent rail corridor to the north and two hydro corridors may require buffers/setback
- Prime agricultural land
- Pump station(s) would likely be required to allow sanitary servicing to cross Kettle Creek (at Wellington Road and Sunset Drive, respectively)
- Potential upgrades may be required to increase capacity of Walnut Street Pumping Station and pressurized wastewater piping
- May be cross jurisdictional/boundary issues associated with roads and servicing
- On its own, does not satisfy land need requirements

OPPORTUNITIES

- Largest area
- Vacant rail corridor presents excellent opportunity for active transportation infrastructure
- Close proximity to existing water distribution system (incl. St. Thomas Area Secondary Distribution Supply System on Major Line)
- Potential to service lands by gravity sanitary sewer along Fingal Line, in conjunction with Area 3
- Ability to access St Thomas urban area, London and Highway 401 from Fingal Line to Sunset Drive



CONSTRAINTS/ISSUES

- Development constrained by topography (steep hills to the east), natural heritage features (ability to access north portion) and rail corridor which bisects the area
- Sanitary pumping station likely required to cross Kettle Creek, west of Sunset Drive.
- Potential upgrades may be required to increase the capacity of the Walnut Street Pumping Station and pressurized wastewater piping.
- Prime agricultural land
- Active livestock operation to the north
- Separate ownership of former rail corridor and narrow land areas may cause challenges to development
- Limited road access to/from Fingal Line for the size of the area
- Future extension of Major Line would be needed to provide access to northern portion, which requires significant costs and creek crossing
- Future expansion of Fingal Line constrained by bridge crossing
- Transit service would require relatively circuitous routing

OPPORTUNITIES

Vacant lands designated for residential uses to the east, extension of servicing could benefit adjacent lands

Opportunities for development of active transportation connections



CONSTRAINTS/ISSUES

Developable area constrained by presence of natural features and general fragmentation of lands

Remediation may be required for former railway yard lands

Limited road access points to/from Bush Line due to horizontal road curvature (site lines)

Requirements for future upgrades/expansion of Bush Line may justify total replacement to accommodate transit vehicles

Fragmentation of lands would require multiple roadway intersections along Bush Line

Within minimum distance separation of former landfill and wastewater treatment plant

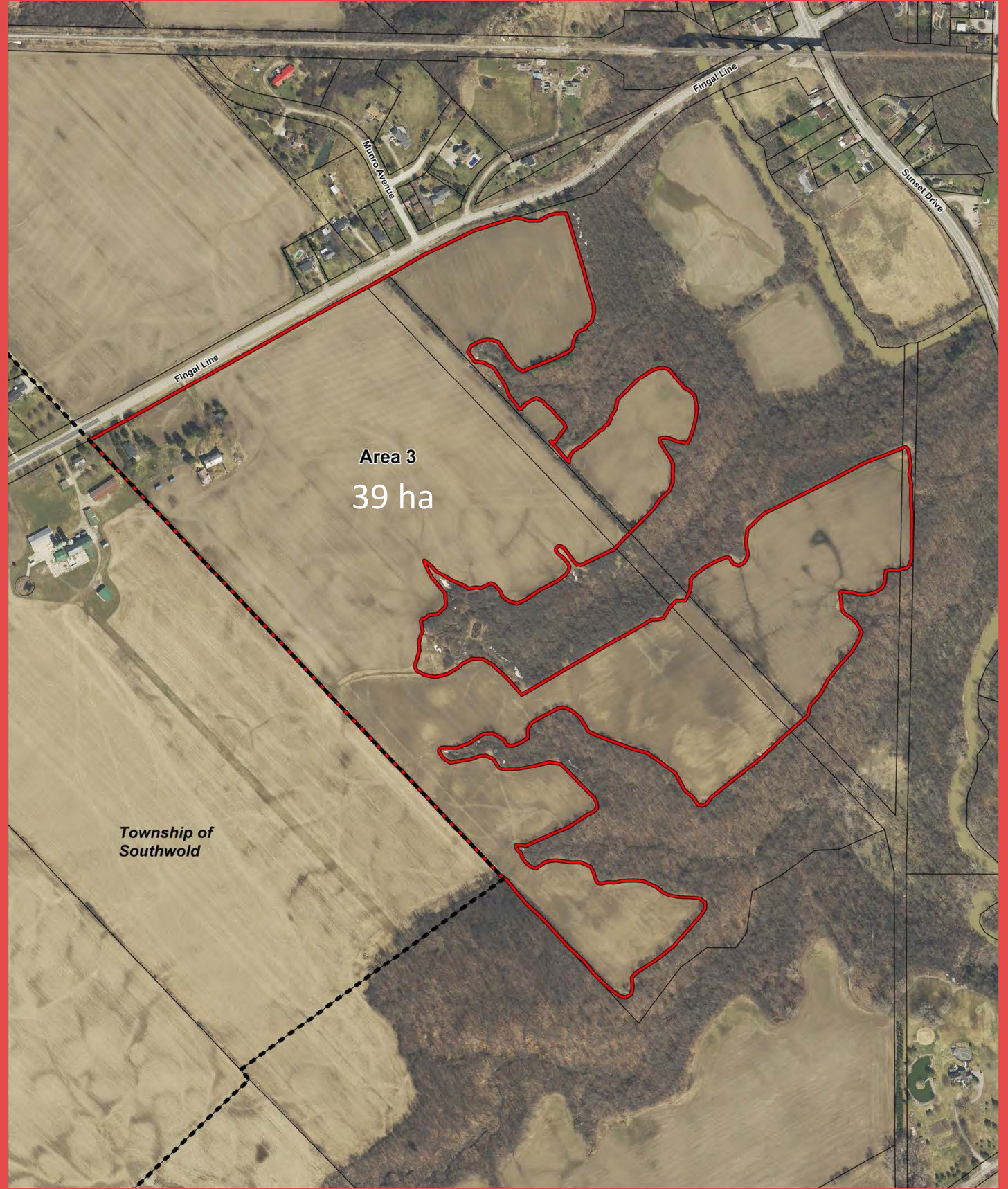
Four separate pieces of land in multiple ownership to be developed

On its own, does not satisfy projected land needs

Sanitary pumping station likely required to cross Kettle Creek

OPPORTUNITIES

- Potential to service lands by gravity sanitary sewer along Fingal Line, on conjunction with Area 2
- Ability to access St Thomas urban area, London and Highway 401 from Fingal Line to Sunset Drive
- Good road access to/from Fingal Line for size of the area
- Good proximity to elementary school (Southwold Public School)
- Opportunities for active transportation



CONSTRAINTS/ISSUES

- Small area, on its own it does not meet the City's 2041 residential land needs
- Developable area constrained by presence of natural features
- Sanitary pumping station likely required to cross Kettle Creek
- Potential upgrades may be required to increase the capacity of the Walnut Street Pumping Station and pressurized wastewater piping
- Active livestock operation to the west
- On its own, does not satisfy projected land needs
- Narrow land areas may cause challenges to development
- Future expansion of Fingal Line constrained by bridge crossing
- Transit service would require relatively circuitous routing

Reference Committee Presentation

St. Thomas Positioned For Growth

Reference Committee Presentation

June 17, 2019

DILLON CONSULTING

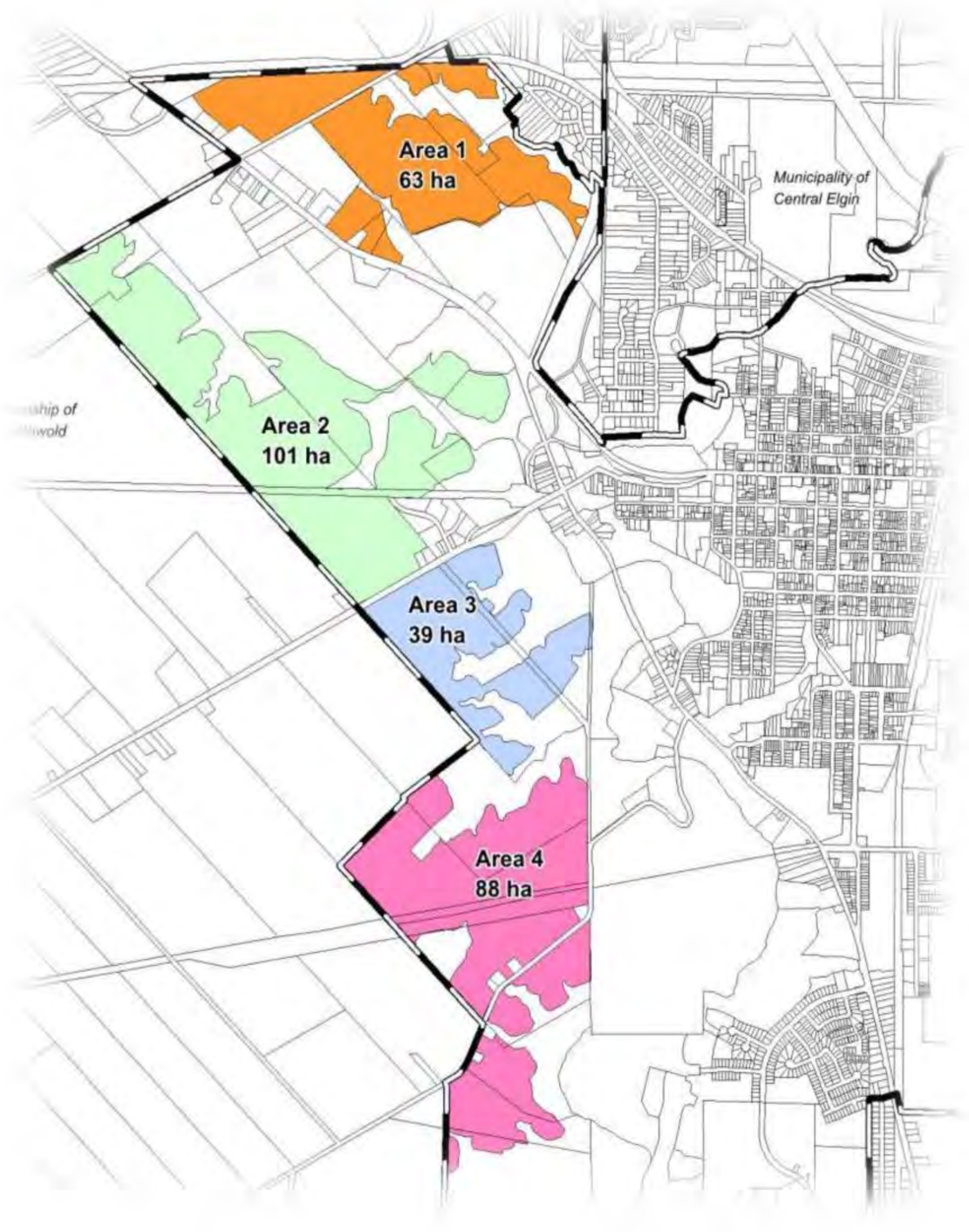
Monteith Brown planning consultants

Agenda

1. Purpose of the Project
2. Project Process and Status
3. Public Engagement – what we have heard to date
4. Evaluation Framework and Preliminary Results
5. Next Steps

St. Thomas is Growing

- The City of St. Thomas has a projected 20-year residential forecast of 50,600 people by 2041.
- In June 2018, Watson and Dillon (on behalf of the City) completed a population and housing study that identified the need for an additional 76 gross hectares of residential land to accommodate the projected population growth.
- This project builds on a study from 2010 where lands within the north-west quadrant of the City along with other land blocks on the west and south-east sides of St. Thomas were strategically assessed for residential designation.
- Remaining expansion lands from that study are being reassessed as part of this project.



Purpose of the Project

City will be a magnet for growth over the next several decades and will need to adjust Urban Area boundary to accommodate that growth.

- The *Positioned for Growth* project will:
  1. Identify preferred expansion lands through planning and engineering studies;
  2. Prepare the OPA to bring those lands into the Urban Area and designate them for development; and
  3. Identify the infrastructure and community services needed to support expected growth.

The Positioned for Growth Studies



Planning Studies

Study Purpose: *To evaluate and select the preferred settlement expansion area and facilitate/support the necessary Official Plan Amendment for the Urban Area Expansion.*



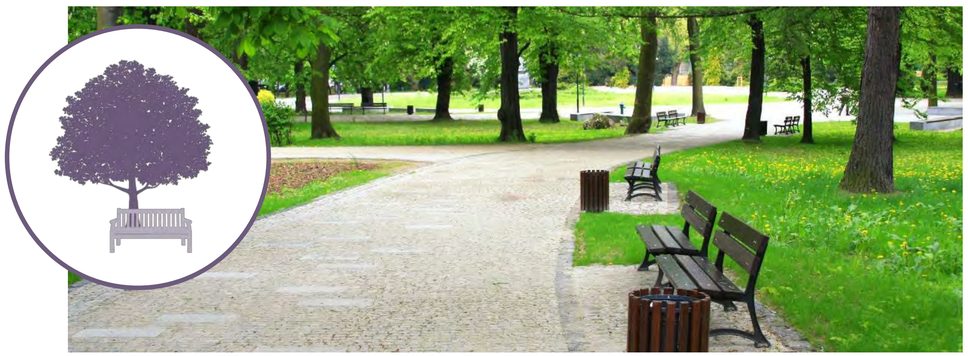
Engineering Studies

Study Purpose: *To support the selection of the preferred settlement expansion area and identify the infrastructure requirements needed to support its development.*



Fire Station Location Study

Study Purpose: *To review the City's fire stations and fire protection services delivery model to identify the most efficient and effective model to serve the City's planned Urban Area (including this settlement expansion area) and meet all current best practices and standards.*



Parks & Recreation Master Plan

Study Purpose: *To develop a community-supported plan that provides the policy framework to manage, serve and support residents and visitors with the needed parks, open space, trails, recreation and leisure recreation facilities, services and programming in a cost effective and proactive manner.*

St. Thomas Positioned for Growth
PROJECT SCHEDULE

	WORK PLAN 1: PLANNING STUDIES	January 2019				February 2019				March 2019				April 2019					May 2019				June 2019				July 2019					August 2019				September 2019				
		07	14	21	28	04	11	18	25	04	11	18	25	01	08	15	22	29	06	13	20	27	03	10	17	24	01	08	15	22	29	05	12	19	26	02	09	16	23	30
1.1	**PHASE 1: BACKGROUND AND EXISTING CONDITIONS**																																							
1.1.1	**PROJECT KICK OFF MEETING**																																							
1.1.1.1	*Prepare agenda and attend meeting*		M																																					
1.1.1.2	*Confirm project budget, schedule and work plan*																																							
1.1.1.3	*Prepare meeting minutes*																																							
1.1.2	**POLICY AUDIT**																																							
1.1.2.1	*Prepare policy audit table and conduct policy audit*																																							
1.1.2.2	*Teleconference with staff to discuss results and next steps for any gaps identified*										M																													
1.1.2.3	*Consultation with the Ministry of Municipal Affairs and Housing*																																							
1.1.3	**BACKGROUND REVIEW AND ANALYSIS OF EXISTING CONDITIONS**																																							
1.1.3.1	*Work with Planning staff to prepare existing conditions maps*																																							
1.1.3.2	*Prepare overview of technical studies completed in support of the MCR (for use in PJR)*																																							
1.1.4	**PUBLIC AND STAKEHOLDER ENGAGEMENT**																																							
1.1.4.1	*Finalize Public and Stakeholder Engagement Plan*																																							
1.1.4.2	*Work with staff to launch project website and social media campaign*																																							
1.1.4.3	*Draft project launch notices for website, newsletters and social media*																																							
1.2	**PHASE 2: EVALUATION OF ALTERNATIVES**																																							
1.2.1	**EVALUATION CRITERIA FOR SETTLEMENT EXPANSION AREA**																																							
1.2.1.1	*Prepare evaluation matrix*																																							
1.2.1.2	*Teleconference with team to review and confirm evaluation criteria*											M																													
1.2.2	**EVALUATION OF ALTERNATIVES**																																							
1.2.2.1	*Work with Planning staff to prepare issues and opportunities maps*																																							
1.2.2.2	*Evaluation workshop with staff*														M																									
1.2.3	**PUBLIC AND STAKEHOLDER ENGAGEMENT**																																							
1.2.3.1	*Draft consultation materials and prepare for event*																																							
1.2.3.2	*Coffee Conversations Public Event*																		P																					
1.2.3.3	*Draft project updates/notices for website, newsletters and social media*																																							
1.3	**PHASE 3: PREFERRED ALTERNATIVE**																																							
1.3.1	**PREFERRED SETTLEMENT BOUNDARY EXPANSION AREA**																																							
1.3.1.1	*Identify preferred settlement expansion area and prepare technical summary*																																							
1.3.2	**PUBLIC AND STAKEHOLDER ENGAGEMENT**																																							
1.3.2.1	*Draft consultation materials and prepare for event*																																							
1.3.2.2	*Positioning St Thomas for Growth Open House and Walking Tour*																								P															
1.3.2.3	*Draft project updates/notices for website, newsletters and social media*																																							
1.4	**PHASE 4: DOCUMENTATION**																																							
1.4.1	**PLANNING JUSTIFICATION REPORT**																																							
1.4.1.1	*Draft and final Planning Justification Report*																																							
1.4.2	**PREPARATION OF OPA AND ZBA**																																							
1.4.2.1	*Draft Official Plan policy directions memo*																																							
1.4.2.2	*Finalize Official Plan Amendment and review ZBA*																																							
1.4.3	**PUBLIC AND STAKEHOLDER ENGAGEMENT**																																							
1.4.3.1	*Draft consultation materials and prepare for event*																																							
1.4.3.2	*Prepare for and attend Statutory Public Meeting (for Parts 1-3)*																																					P		
1.4.3.3	*Council presentation*																																					C		
1.4.3.4	*Draft project updates/notices for website, newsletters and social media*																																							
	PROJECT MANAGEMENT																																							
	Update project schedule and submit monthly																																							
	Prepare and submit monthly invoicing																																							
	Project management calls						M				M		M			M		M							M		M													
	Quality reviews of deliverables																																							

WE ARE HERE

Legend:

Phase Duration | Task Duration | Deliverable Submitted to Client | Meeting or Teleconference M | Council Meeting C | Public Event P

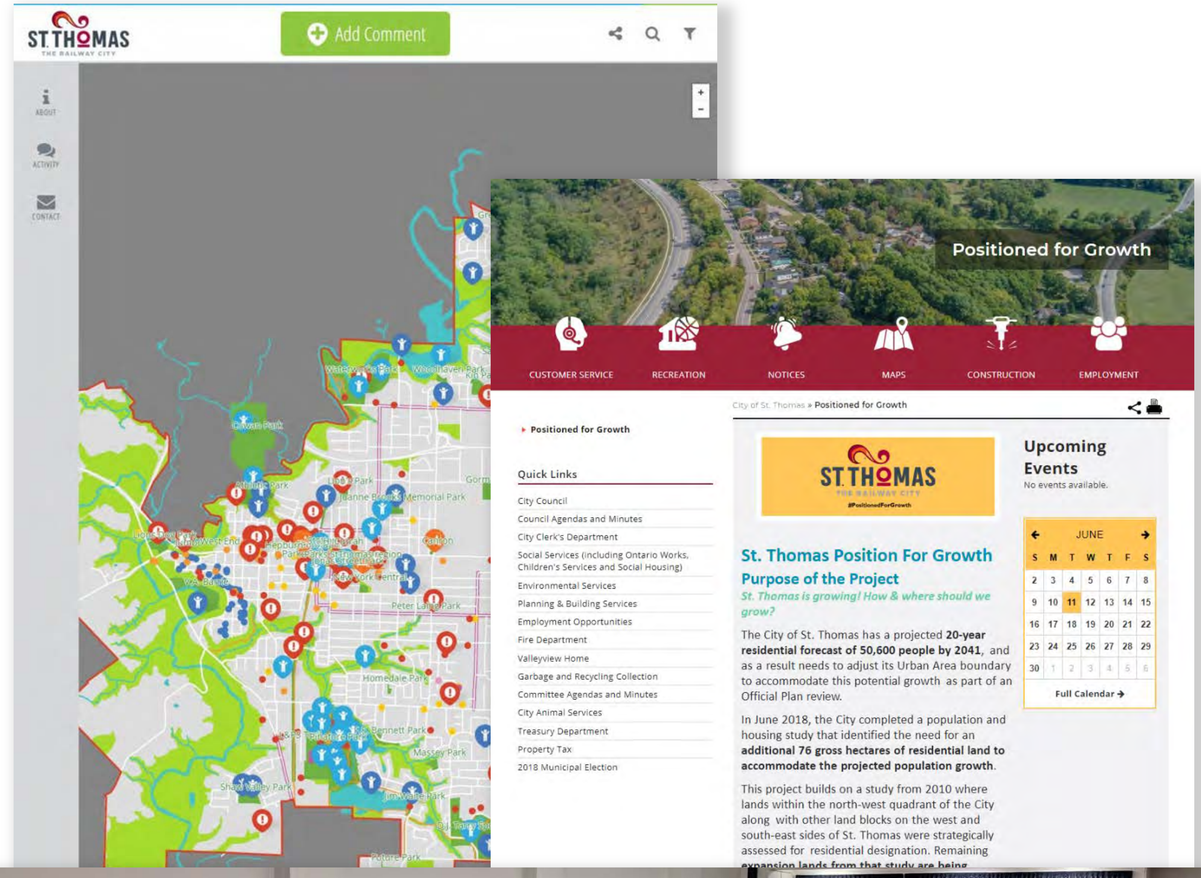
Notes:

RFP lists project start date as January 3, 2019; as that date falls on a Thursday, and in a week which starts in December 2018, this schedule shows project start from the first week in January 2019.

Public Engagement

Overview of Community Engagement

- Project Webpage: **StThomas.ca/PositionedForGrowth**
- Parks and Recreation online surveys:
  - **430 responses** on programming survey
  - **95 responses** on opportunities and constraints mapping
- Stakeholder workshops
  - **44 organizations** participated
- Coffee Conversations with the Mayor
  - **80 attendees** to two events on May 8, 2019
- Social Media:
  - **Twitter, Facebook**

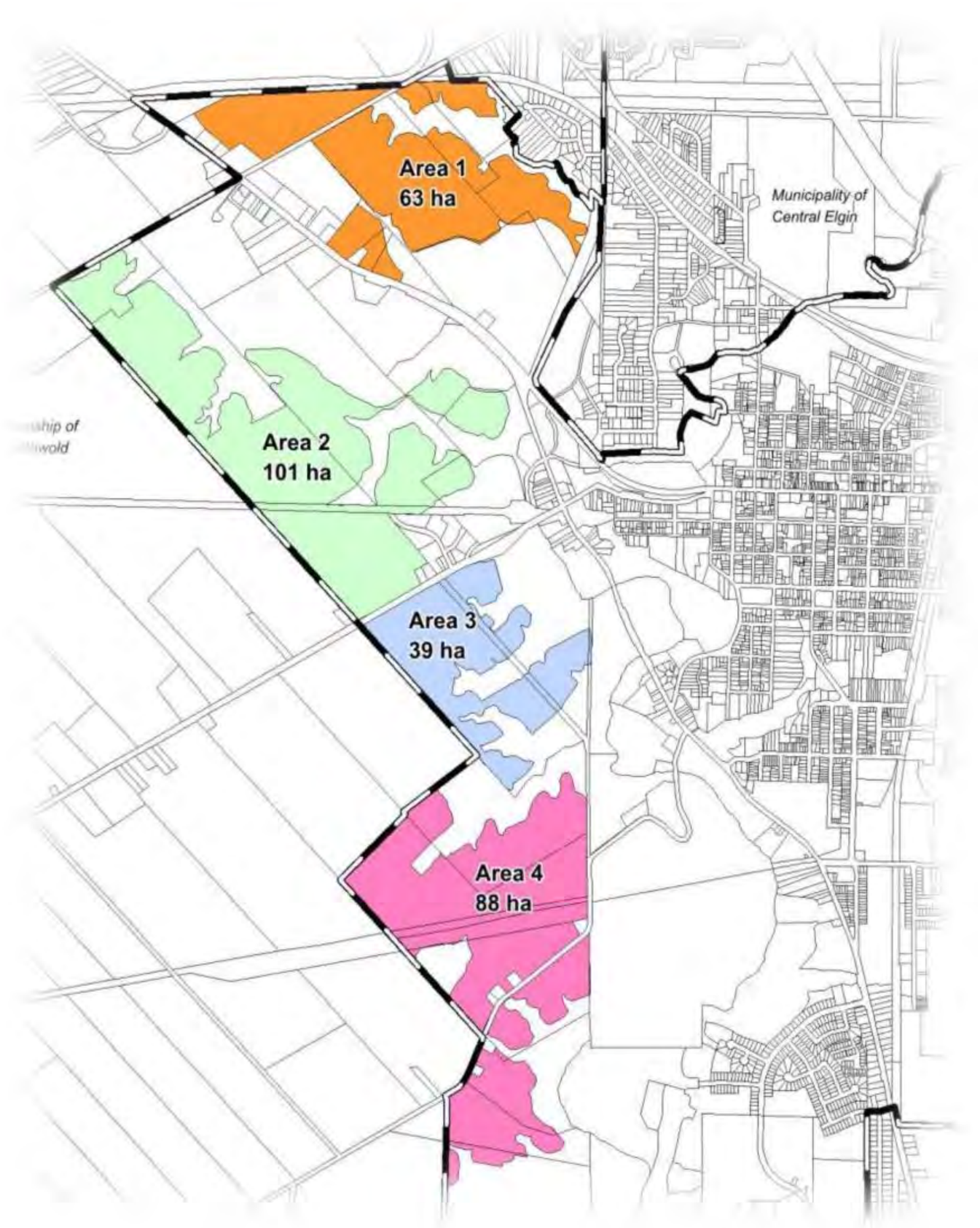




What we have heard to date

- Need for **municipal servicing** of adjacent areas and surrounding residents (including Highway Commercial lands along Sunset Drive)
- Protection and enhancement of **parks and natural heritage features**, along with improved infrastructure (i.e. splashpads, dog parks, etc.)
- Facilities and programming to support local **community placemaking** (i.e. community centres)
- Increased **affordable housing**
- Use of **inclusionary zoning**
- Ensure **traffic** flows are maintained without congestion
- Need for more **recreational trails, park washrooms, parks and open space,** and **beautification**
- Increases in **community events, aquatic recreation, concerts,** and **programming** (i.e. volleyball) put on by the City

Evaluation Framework and Preliminary Results



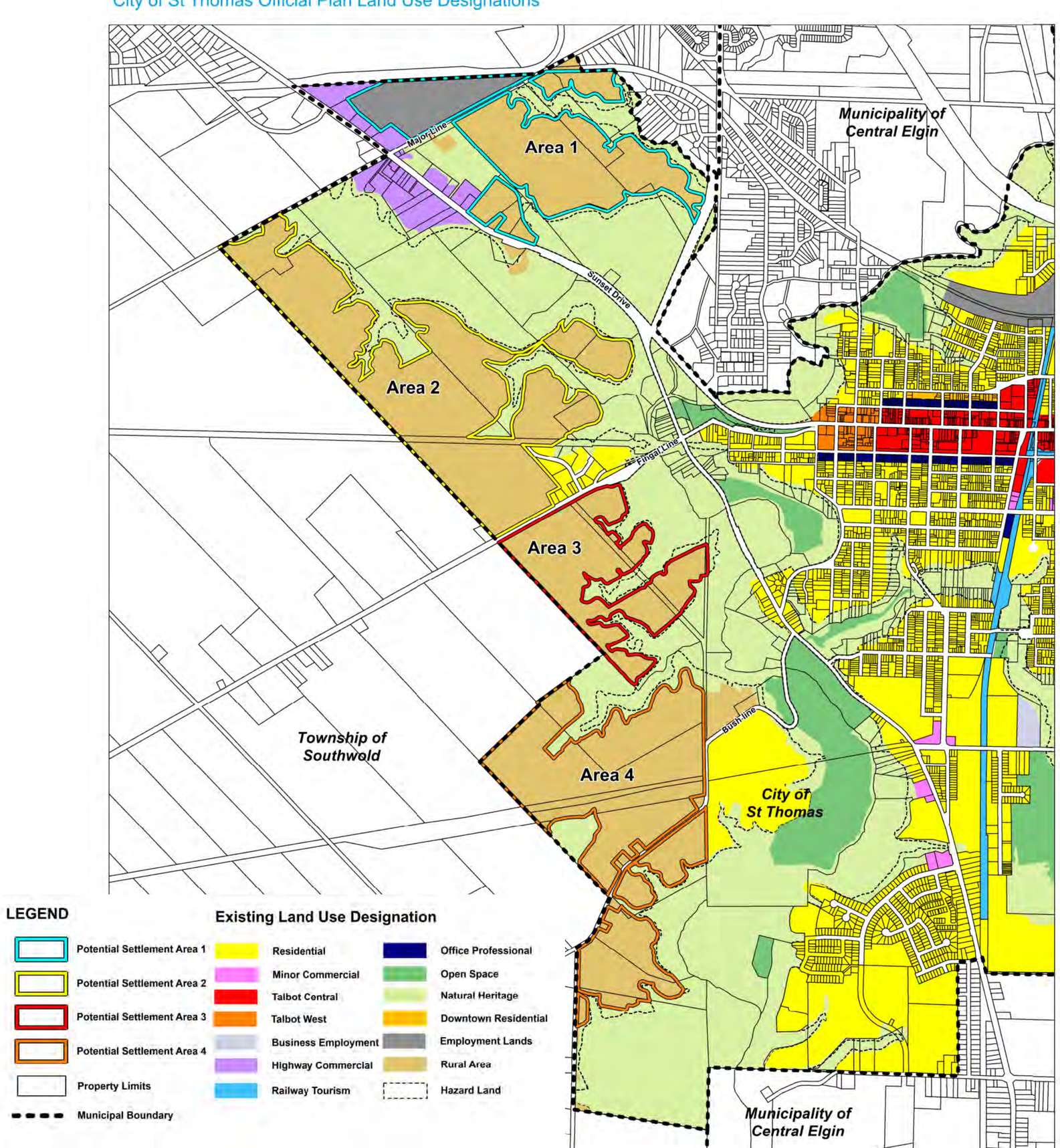
EVALUATION CRITERIA

- PROXIMITY TO EXISTING BUILT-UP AREA
- PROXIMITY TO OTHER PLANNED AREAS FACILITIES, PARKS & OPEN SPACES
- LAND USE COMPATIBILITY
- HOUSING
- EASE OF DEVELOPMENT
- NATURAL HERITAGE
- SURFACE & GROUNDWATER
- AGRICULTURAL IMPACTS
- MINERAL & PETROLEUM RESOURCE
- CULTURAL HERITAGE & ARCHAEOLOGY
- NATURAL HAZARDS
- HUMAN-MADE HAZARDS
- TRANSIT
- ROAD IMPROVEMENTS
- WATER IMPROVEMENTS
- SANITARY SEWER SYSTEM
- AIR QUALITY AND CLIMATE CHANGE
- OVERALL CAPITAL COSTS
- CROSS JURISDICTIONAL

Urban Lands

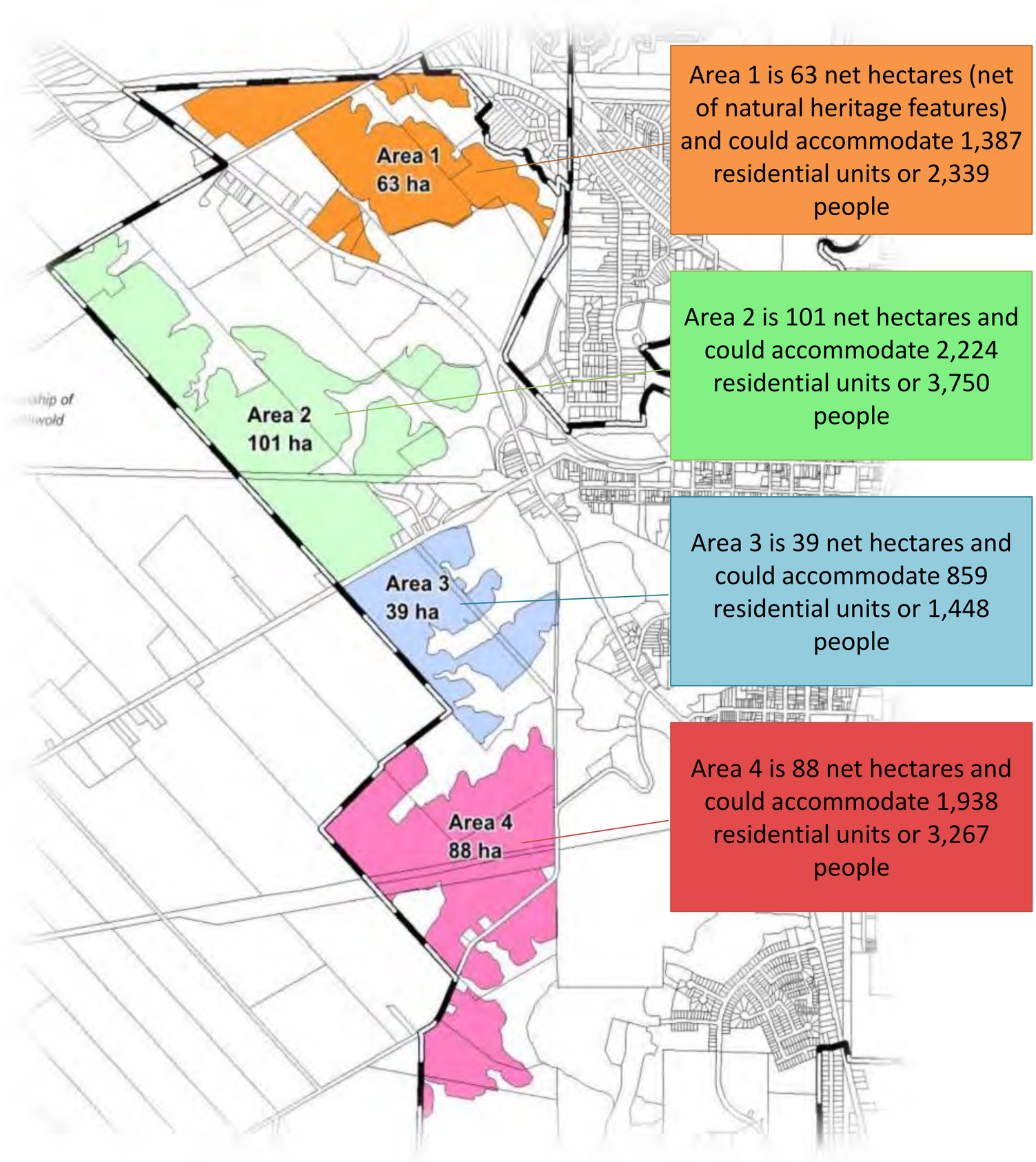
All of the areas are in proximity to urban designated lands:

- Area 1: Highway Commercial uses along Sunset Dr. and the Lynhurst neighbourhood in Central Elgin.
- Area 2 & 3: Residential neighbourhood on Munro Ave.
- Area 4: Vacant residential lands south of Bush Line.



Projected 2041 Residential Land Supply

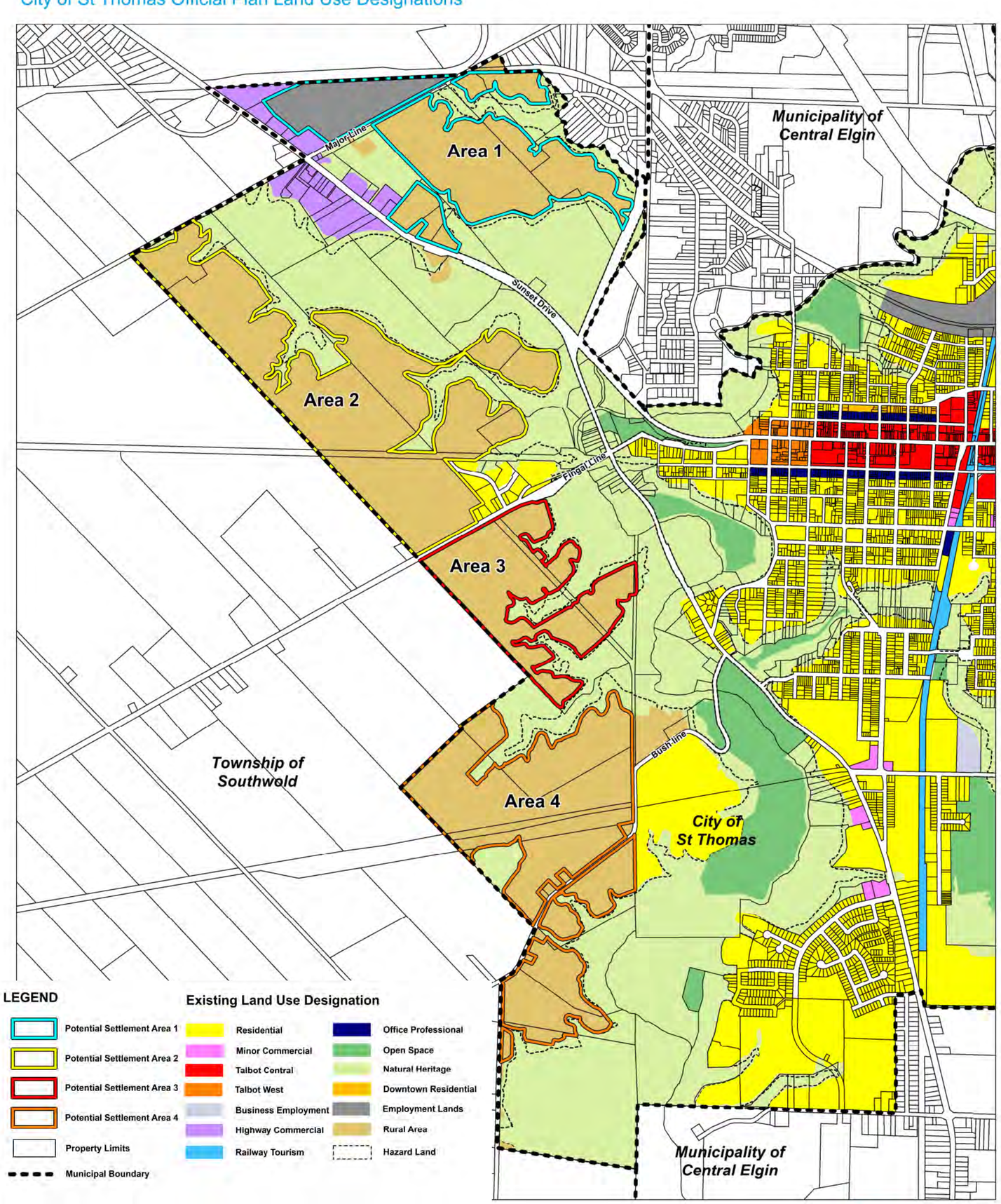
- The St. Thomas 2018 Population and Housing Study identified a need for greenfield land to accommodate 1,048 residential units.
- Individually, Area 1, 2 and 4 could provide sufficient land to accommodate the demand to 2041, Area 3 on its own does not.



Natural Heritage

All of the Areas will require buffers from the natural heritage system and an assessment of species at risk, which will be undertaken at the time of development.

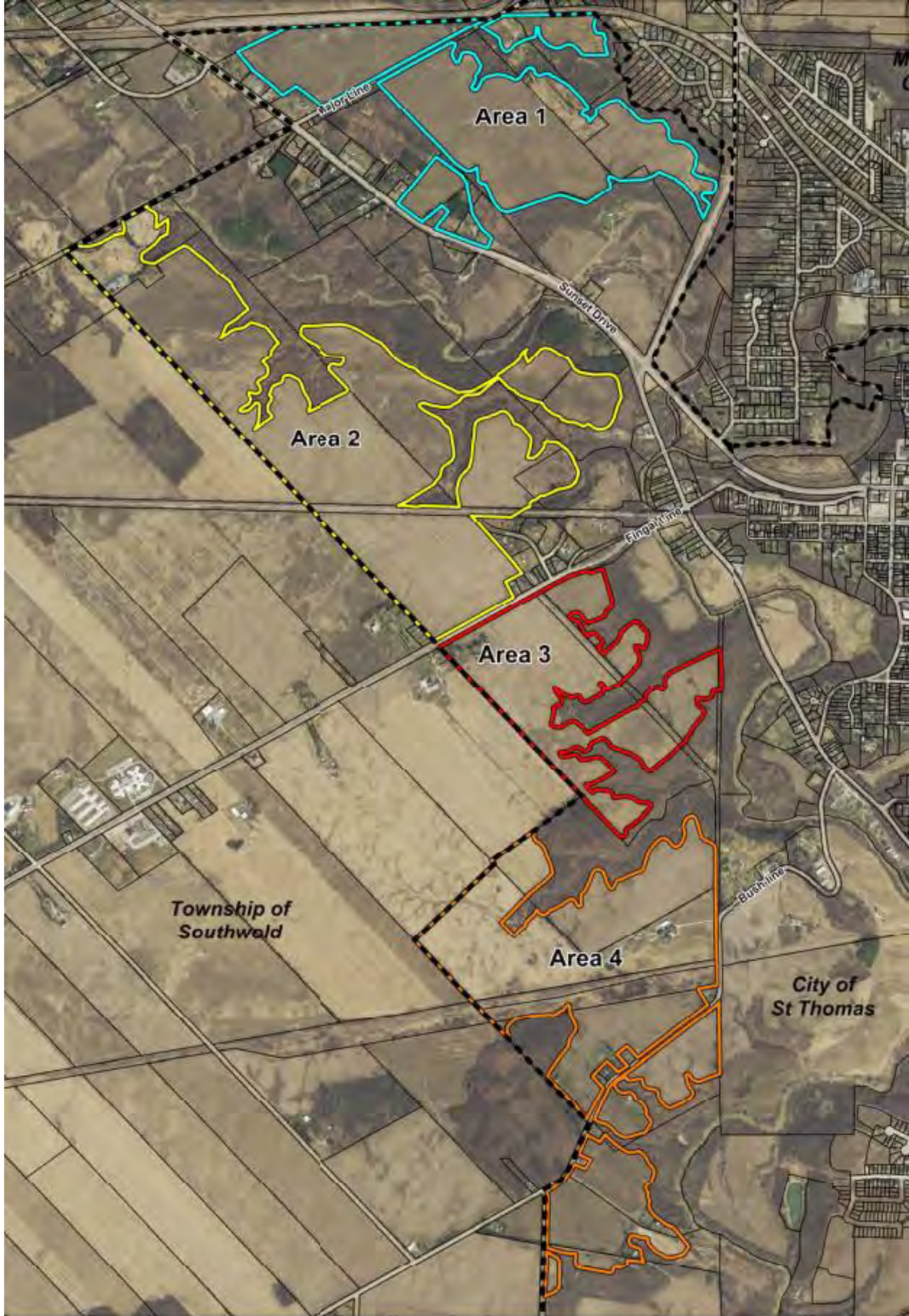
- Area 1 is surrounded by Natural Heritage features to the south, east and west of the three areas of land designated Rural Areas south of Major Line. The lands north of Major Line have limited Natural Heritage features identified that will require a buffer.
- Area 2 is surrounded by Natural Heritage features to the east. Several areas of land may be a challenge to access while avoiding Natural Heritage features and their buffers.
- Area 3 is surrounded by Natural Heritage features to the east and south. One area may be a challenge to access while avoiding Natural Heritage features and their buffers.
- Area 4 is surrounded by Natural Heritage features to the east, north and south. Several areas may not be feasible for development due to remaining amount of land once buffers are applied.



Ease of Development

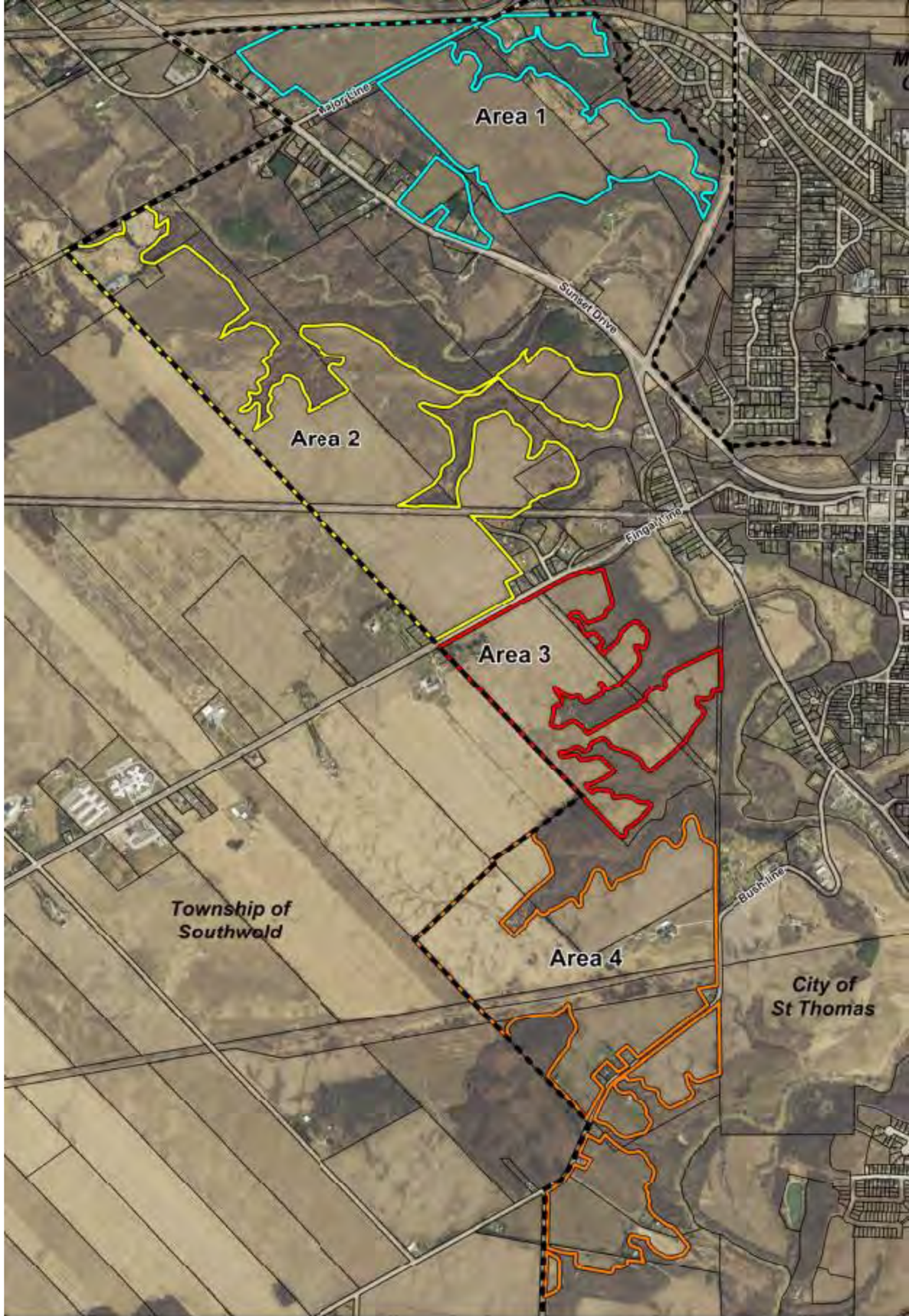
All of the Areas have several constraints to development:

- Area 1 includes four pieces of land in separate ownership with access needs and some assembly of land or coordination required, as well as adjacent rail corridor and two hydro corridors that may require buffers/setbacks.
- Area 2 includes a former rail corridor with different ownership bisecting the subject lands, several areas that have narrow or no access options without impacting the natural heritage system and steep topography to the east.
- Area 3 includes several areas that have narrow access options without impacting the natural heritage system and the developable area is constrained by presence of natural heritage features.
- Area 4 includes a former rail corridor with different owner bisecting the subject lands, possible environmental soils constraints, as well as four separate pieces of land in multiple ownership with access needs and some land assembly required.



Natural and Human-Made Hazards

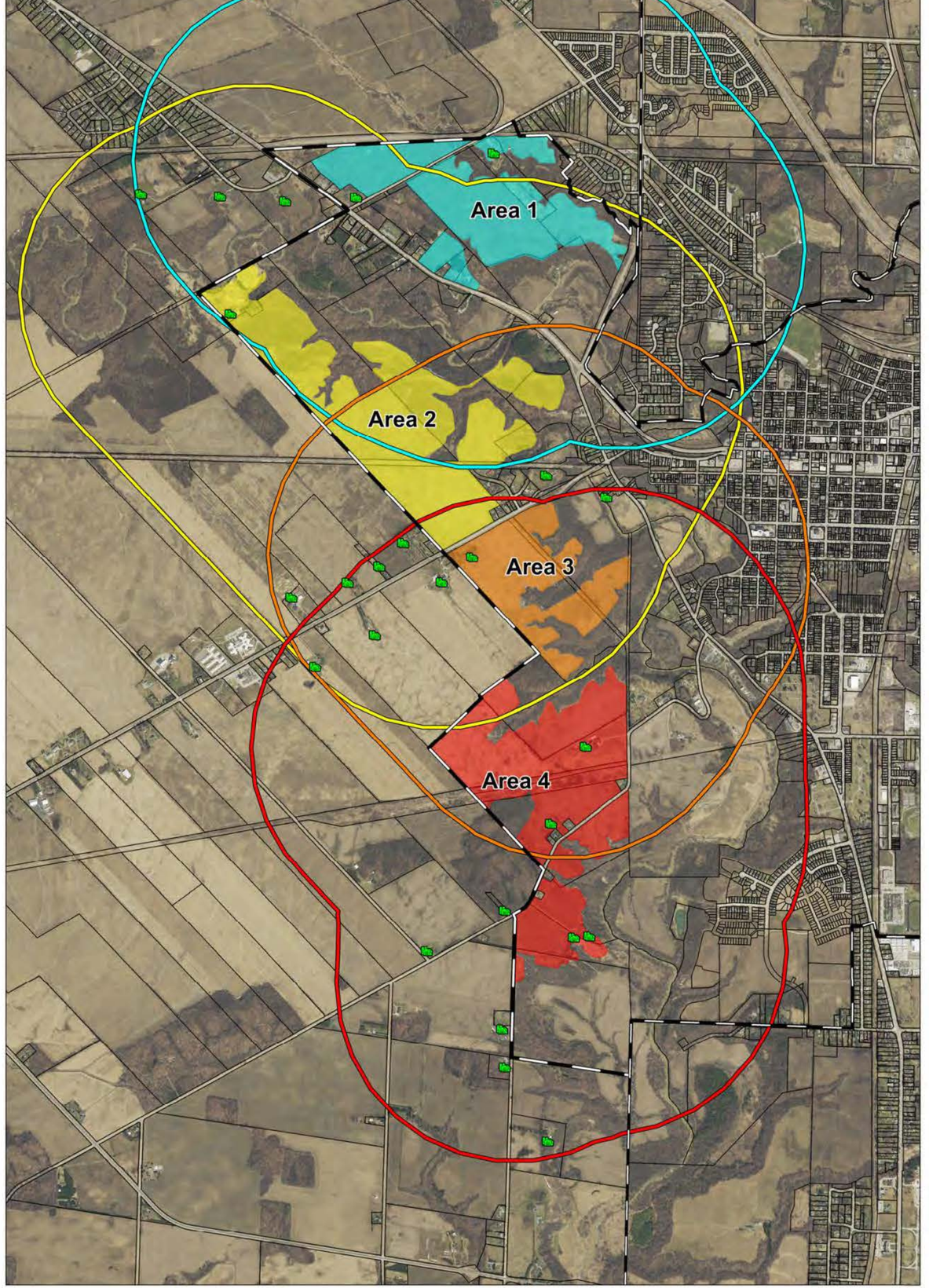
- All of the Areas have flood or erosion hazards that will need to be assessed at the time of development.
- All of the Areas will require a Phase 1 ESA at the time of development to confirm environmental soils conditions. Environmental soils contamination may be present in and around the former rail corridor lands in Area 2 and 4.
- All of the Areas will require a archaeological assessment at the time of development to confirm any archaeological resources.



Agricultural Impacts

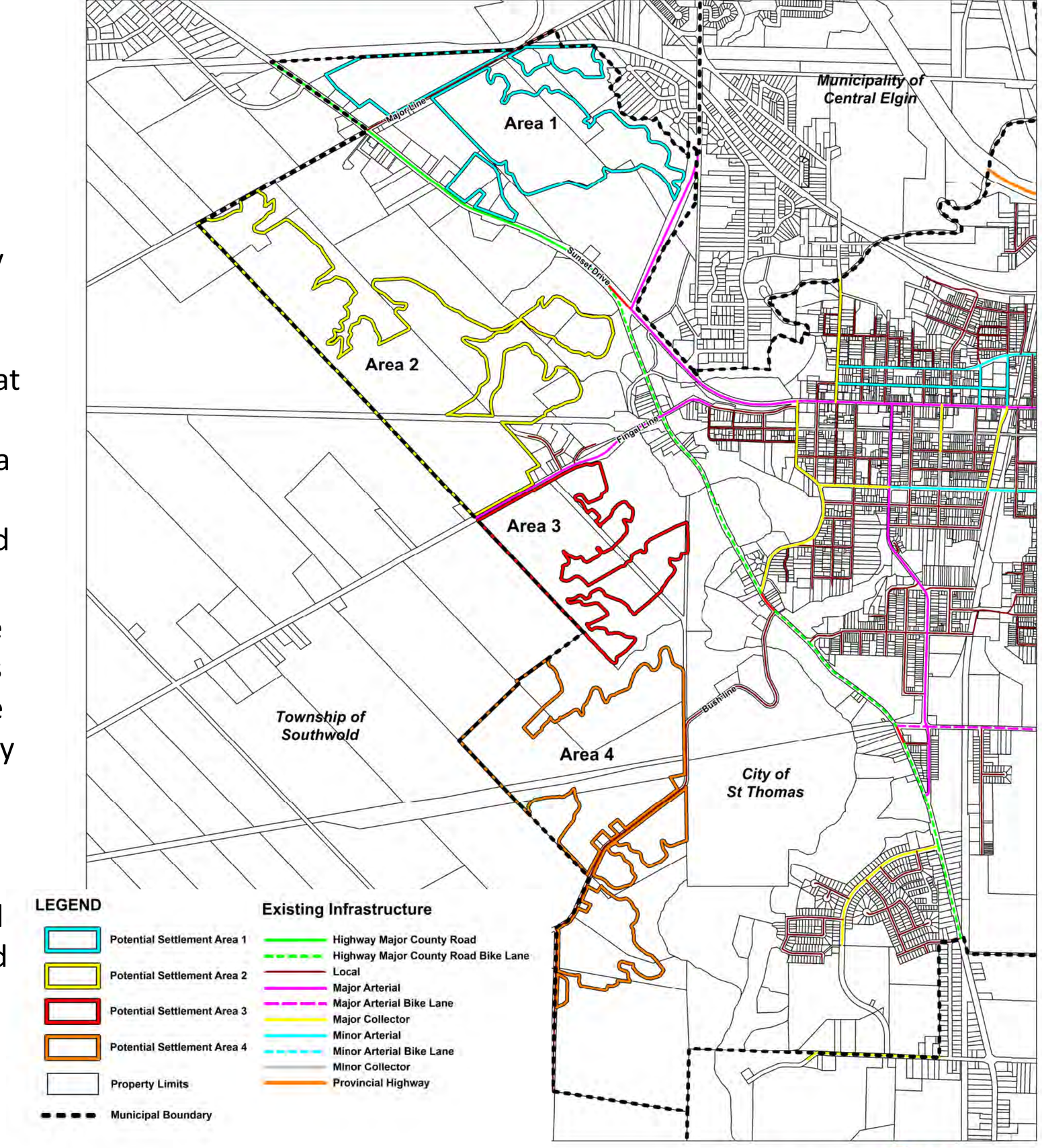
- All of the Areas are Prime Agricultural lands.
- All of the Areas include several potential active livestock operations within or around the subject areas, however:
    - Based on preliminary analysis, the potential active livestock operations in Area 1 are not likely to require minimum distance separations.
    - Area 2 and 3 are least preferred as they include existing large active livestock operations which, based on preliminary analysis, are likely to require a minimum distance separation and other mitigation measures to manage land use conflict. This could limit the availability of land being considered for the settlement area.

Note: Area 4 is likely also impacted by the minimum distance separation from the City's existing Wastewater Treatment Plant on Bush Line and Sunset Drive



Road Improvements

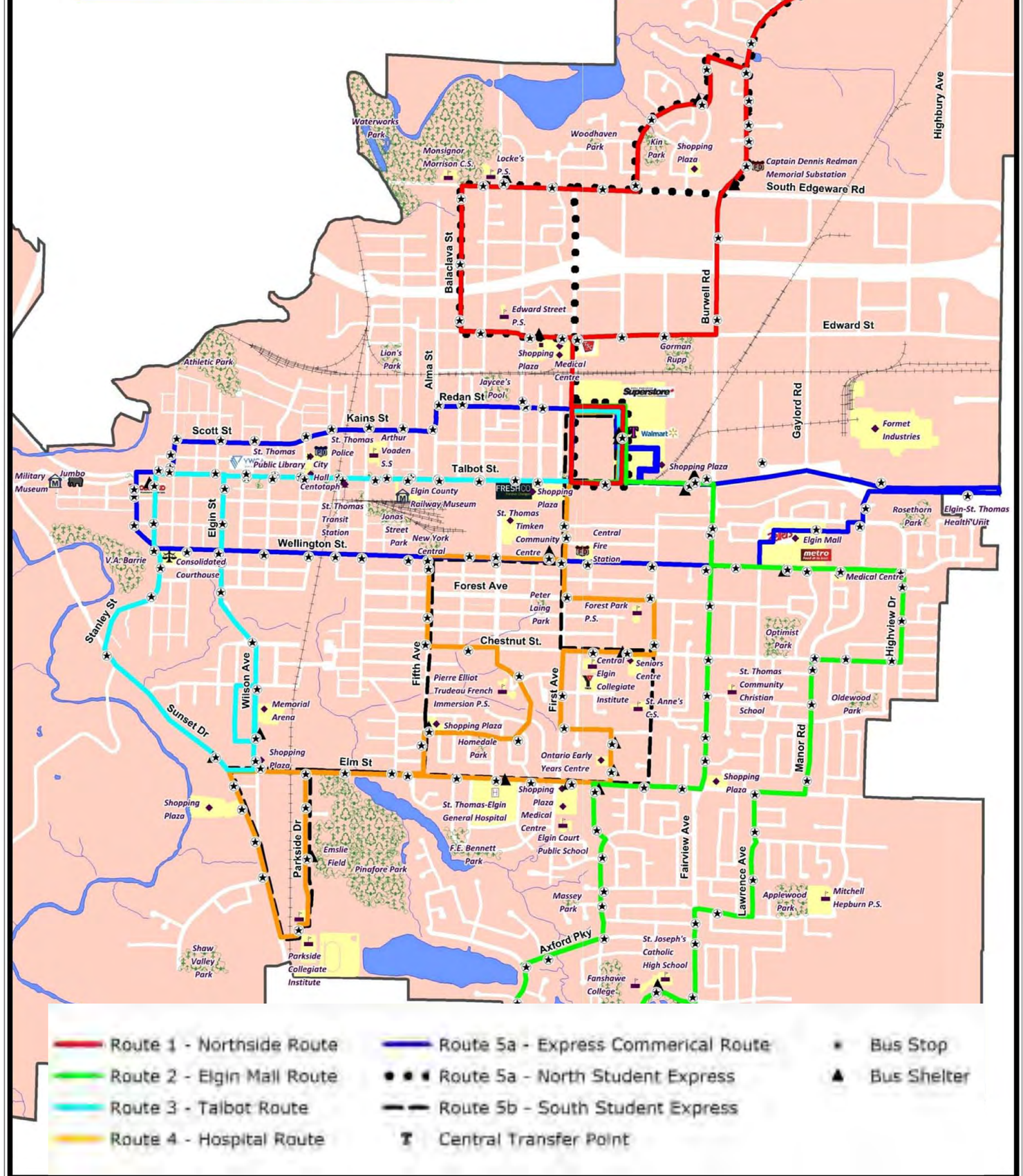
- Area 1 is preferred as it has access to Sunset Drive (Highway or Major County Road in OP) Wellington Road (Major Arterial Road) and Major Line (Local Road). Preliminary analysis suggests that the current road capacity could accommodate the development of Area 1, however if a widening or upgrading was needed, it could be accommodated within the right-of-way.
- Area 2 & 3 have access from Fingal Line (Major Arterial Road), upgrading of this road is highly constrained by the bridge at Sunset Drive. Additional capacity may be required to accommodate Area 2. Sunset Drive south of Talbot Hill may also need improvements.
- Area 4 has access from Bush Line (Local Road), which may require upgrades and additional capacity. Sunset Drive south of Talbot Hill may also need improvements.



Transit and Active Transportation

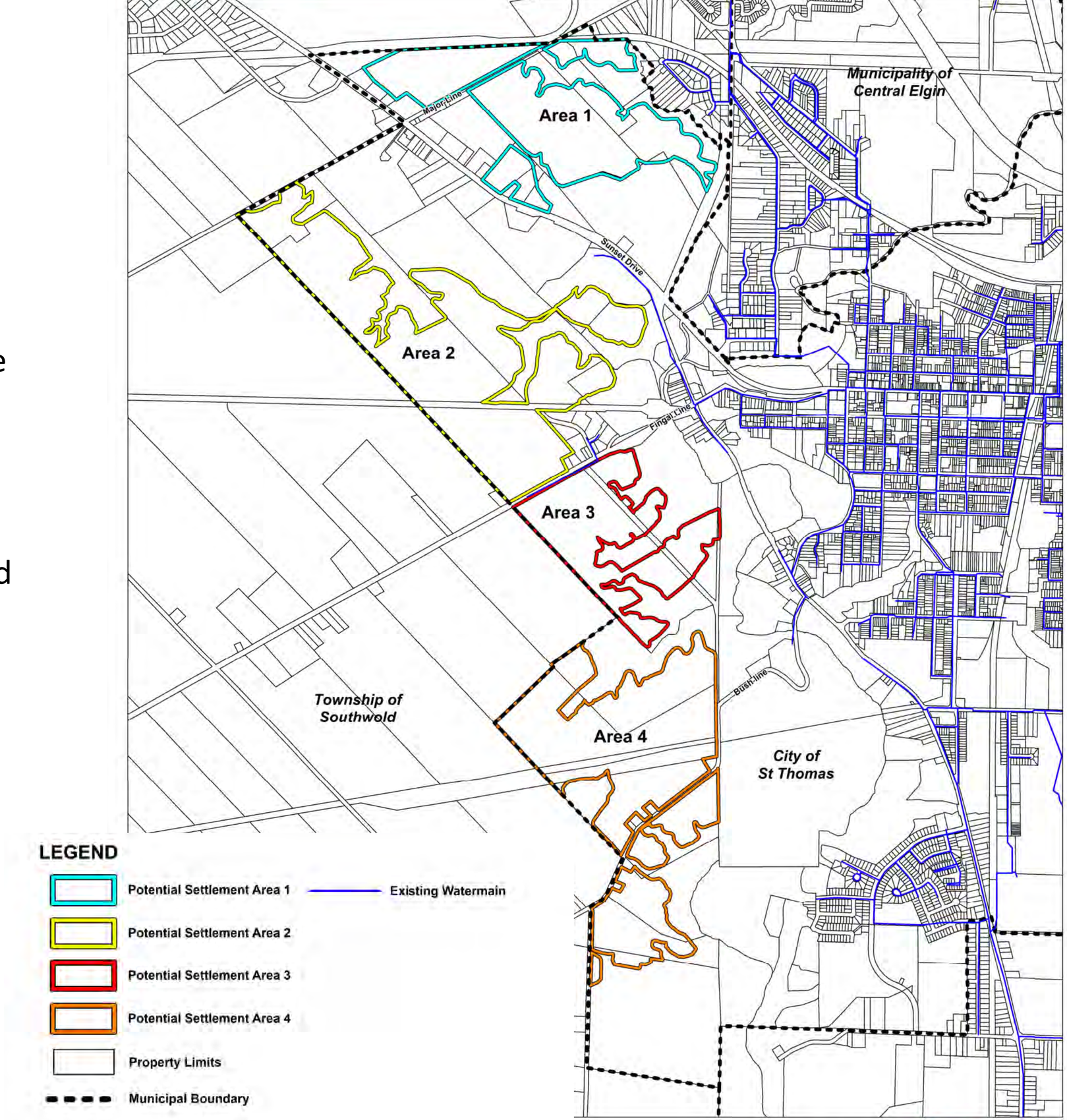
All of the Areas could be connected to the transit network, and have good to moderate active transportation opportunities:

- Area 1: Good opportunity for a multi-use trail (using the abandoned rail corridor that borders the north boundary of the area) which could connect into St. Thomas just north of Downtown.
- Area 2: Good opportunity to connect to active transportation network due to its proximity to the Trans Canada trail network using the former rail corridor.
- Area 3: Moderate opportunity to connect to active transportation network due to its proximity to the Elgin hiking trail west of Area 3 and the abandoned rail corridor north in Area 2.
- Area 4: Moderate opportunity to connect to active transportation network due to its proximity to the Elgin hiking trail south west of Area 4.



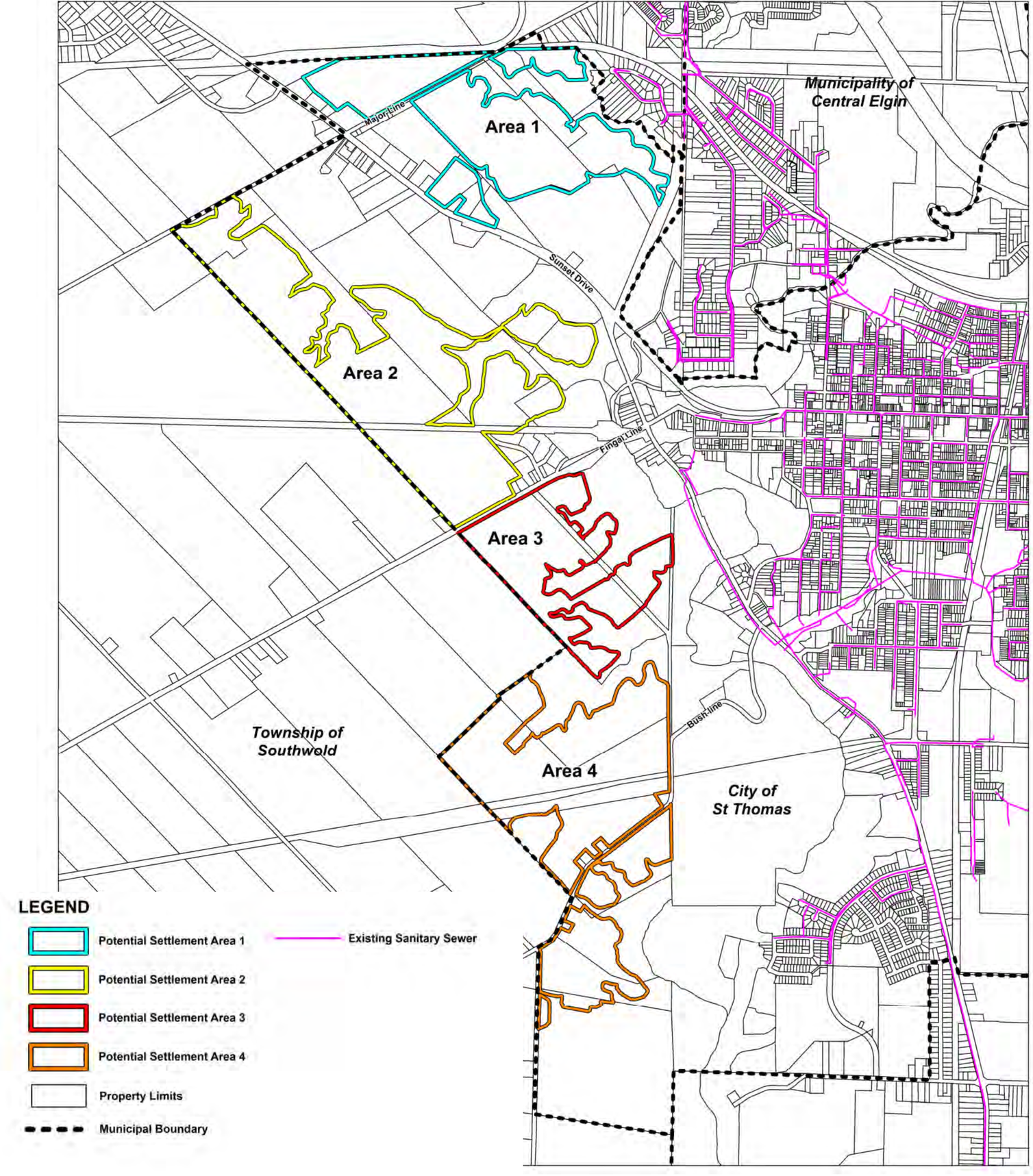
Water Improvements

- None of the Areas are currently serviced.
- Area 1 is preferred as it is in close proximity and may be able to connect to the City or a St. Thomas secondary water supply (subject to capacity). Other properties along Sunset Dr. would benefit from the extension of municipal water servicing.
- Area 2 and 3 may be able to connect to the City or Southwold systems (subject to capacity).
- Area 4 is the farthest from potential connections, could connect to the City system but may be difficult to loop.



Sanitary Sewer System

- Sanitary servicing to all Areas will require a pump station to cross the creek.
- For the other areas additional sanitary infrastructure is needed:
    - Area 1 is least preferred as it would require a second pump station and potential upgrades to increase the capacity of Sunset Pumping Station and forcemain, however sanitary servicing could be sized to accommodate Area 2 and 3.
- Area 2 & 3 can be serviced together and have a potential to service by gravity along Fingal Line, however there is potential upgrades needed to increase the capacity of Sunset Pumping Station and forcemain.



Order of Magnitude Costs

Area 1 Water: **Highest**, longer watermain to adequately service the area from multiple connections. Wastewater: **Highest**, in addition to the infrastructure required for Area 2, 3, would require an additional sanitary sewer and an additional sanitary pumping station to cross the creek. Roads: **Lowest**, anticipated to be able to accommodate demand in excess capacity in the existing road network.	**Area 2** Water: **Lowest**, within close proximity to sufficient connections. Wastewater: **Mid**, requires sanitary sewer extension, a new pumping station to cross Kettle Creek, and upgrades to the Sunset Pumping Station and forcemain. Roads: **Highest**, additional capacity may be required on Fingal Line.
Area 3 Water: **Lowest**, within close proximity to sufficient connections. Wastewater: **Mid**, requires sanitary sewer extension, a new pumping station to cross Kettle Creek, and upgrades to the Sunset Pumping Station and forcemain. Roads: **Lowest**, anticipated to be able to accommodate demand in excess capacity in the existing road network.	**Area 4** Water: **Lowest**, within close proximity to a sufficient connection. Wastewater: **Lowest**, requires sanitary sewer extension and a new pumping station to cross Kettle Creek. Roads: **Highest**, additional capacity may be required on Bush Line.

Note: Costs are growth related and would be largely be Development Charge eligible, subject to Watson's DC analysis

Summary of Evaluation

- Several evaluation criteria themes did not have significant variations when applied to the four areas:
  - Land Use Compatibility
  - Ease of Development
  - Natural Heritage
  - Surface and Groundwater
  - Mineral and Petroleum Resources
  - Cultural Heritage and Archaeology
  - Natural Hazards
  - Human Made Hazards
  - Transit and Active Transportation
  - Emergency Services
  - Air Quality and Climate Change
  - Cross Jurisdictional

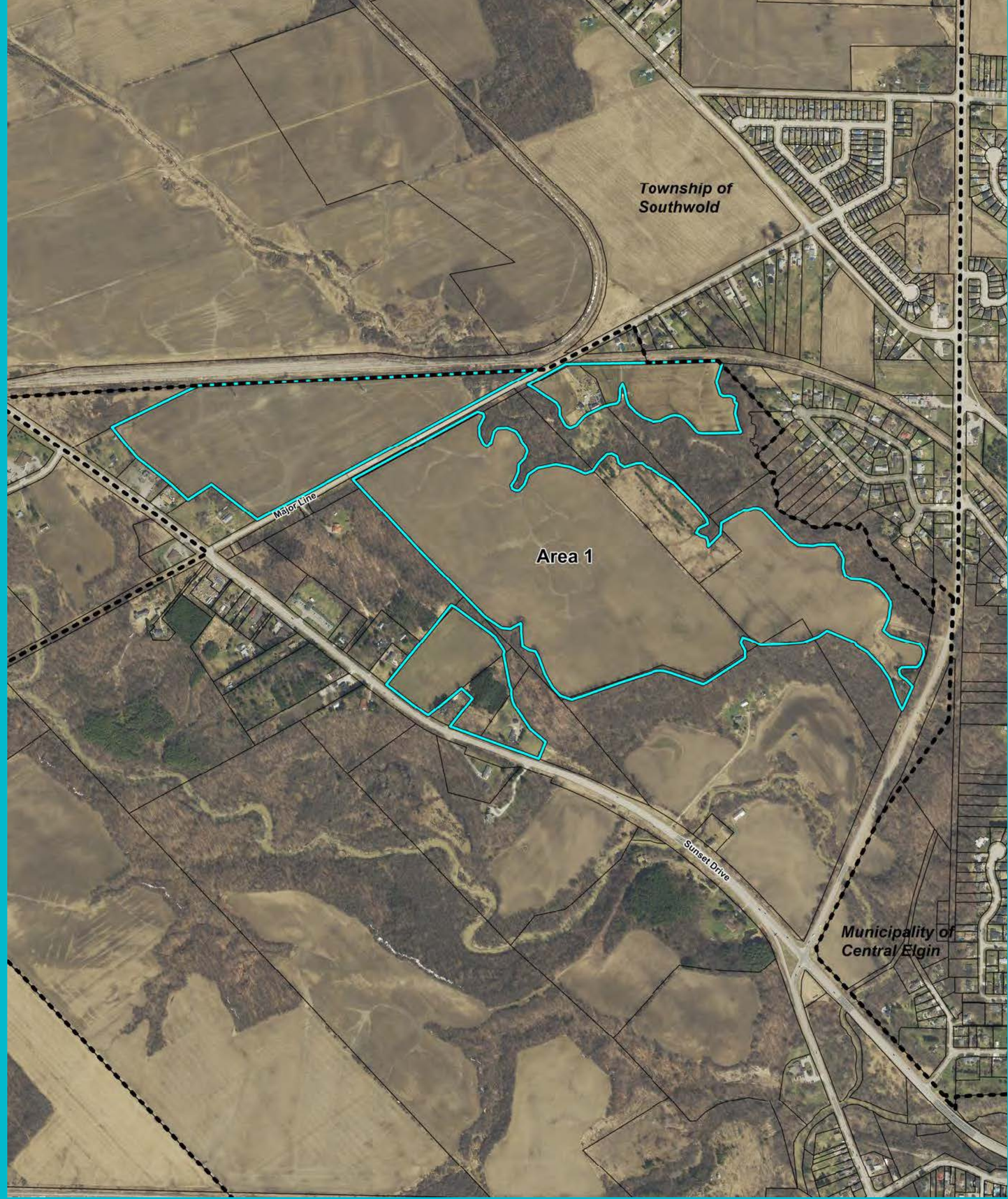
Summary of Evaluation

✓ Preferred – Neutral/Mid Range ✗ Least preferred

	Area 1	Area 2	Area 3	Area 4
Proximity to built up area and other facilities	✓	–	–	–
Housing	✓	✓	✗	✓
Agricultural Impacts	✓	✗	✗	✗
Road Improvements	✓	✗	✓	✗
Water Improvements	✓	–	–	✗
Sanitary Servicing	✗	–	–	✓
Overall Capital Costs	✓	–	✓	✗

Area 1 has been identified as the preliminary preferred area, as it:

- Is in proximity to the existing built area and the most continuous with the existing community.
- Utilizes the City's existing road network and capacity.
- Provides good access to Highway 401, London, adjacent communities and Downtown.
- Would support the extension of servicing to the Highway Commercial Lands along Sunset Drive.
- Municipal servicing could be oversized to accommodate Area 2 and 3 in the future.



Next Steps

Next Steps

- Public engagement on Preferred Settlement Area late June/early July
- Fire Station Location Study progresses with Preferred Settlement Area in July
- Parks and Recreation Facility Analysis in July
- Draft documentation over the summer: Planning Justification Report, Engineering Technical Memo(s)
- Draft Official Plan Amendment and Zoning Bylaw Amendment in September
- Draft Fire Station Location Study in the fall
- Draft Parks and Recreation Master Plan in the fall

QUESTIONS?

Landowner/Public Open House

DILLON CONSULTING

Welcome

Purpose of the Project

St. Thomas is growing! How & where should we grow?

The City of St. Thomas has a projected **20-year residential forecast of 50,600 people by 2041**, and as a result needs to adjust its Urban Area boundary to accommodate this potential growth as part of an Official Plan review.

In June 2018, the City completed a population and housing study that identified the need for an **additional 76 gross hectares of residential land to accommodate the projected population growth**.

This project builds on a study from 2010 where lands within the north-west quadrant of the City along with other land blocks on the west and south-east sides of St. Thomas were strategically assessed for residential designation. Remaining **expansion lands from that study are being reassessed** as part of this project (see graphic to the right).

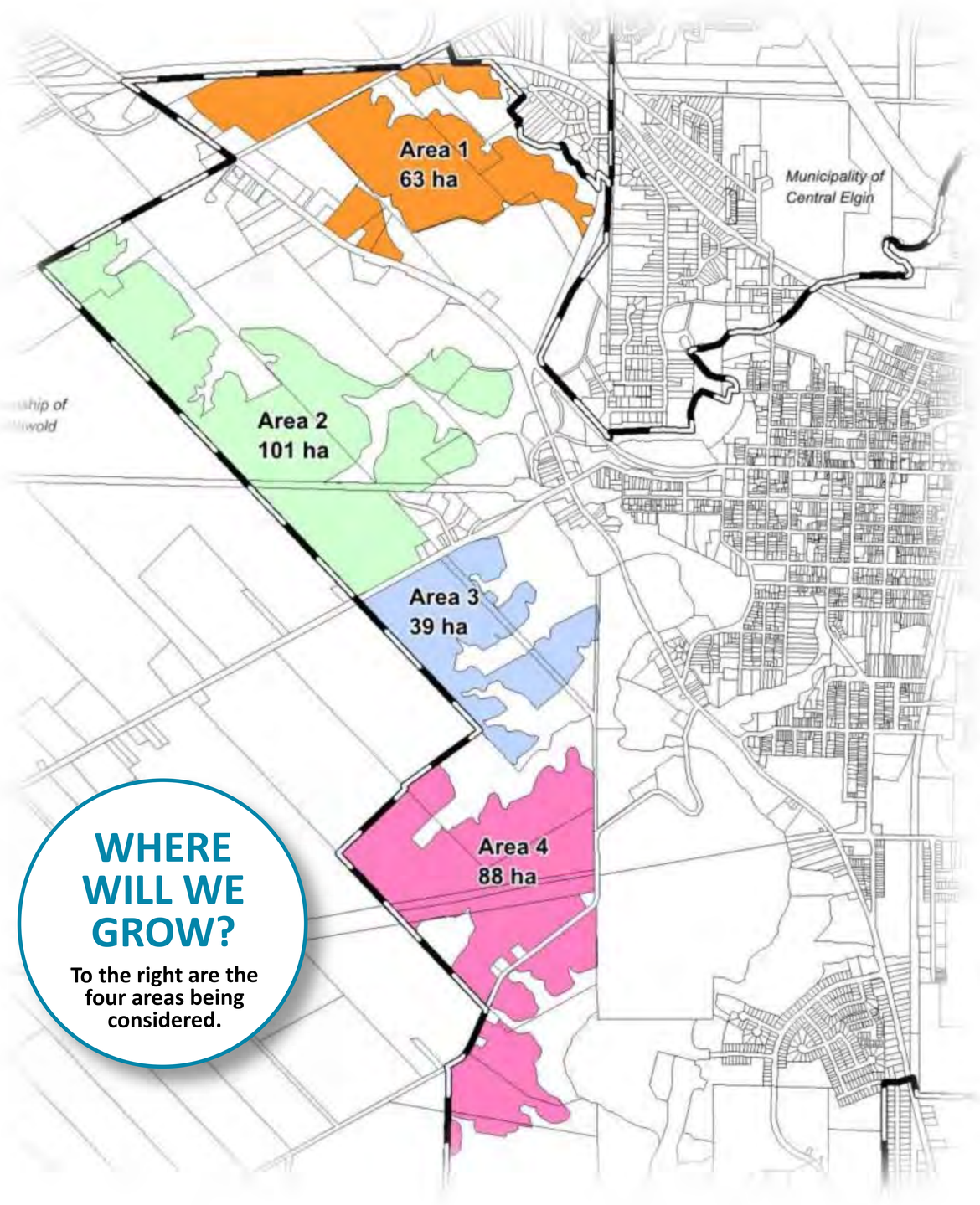
The purpose of this study is to undertake the necessary **planning and engineering studies** to support the preferred expansion lands, bring those lands into the Urban Area boundary, and designate them for development; and identify **citywide recreational and cultural infrastructure**, and **fire protection services** needed to support that growth.

The *Positioned for Growth* study will:

1. Identify preferred expansion lands through planning and engineering studies;
2. Prepare the Official Plan Amendment to bring those lands into the Urban Area and designate them for development; and
3. Identify the infrastructure and community services needed to support expected growth.

Consultation Goals

- Ensure engagement is **inclusive** of diverse stakeholder groups;
- Provide multiple touch points for **two-way conversations** with the community;
- Ensure **early and timely** communication that is in a **clear** and **accessible** format;
- Access a **wide cross-section** of the community through varied communication methods and tactics;
- Provide **transparency** through open public engagement and decision-making processes; and
- Ensure consideration of **public comments and concerns are reflected** in the project outcomes.



WHERE WILL WE GROW?

To the right are the four areas being considered.

Provide us with your feedback today! For more information, please visit

www.StThomas.ca/PositionedForGrowth

ST. THOMAS
THE RAILWAY CITY

Project Studies & Timeline

The *Positioned for Growth* Studies



Planning Studies

Study Purpose: *To evaluate and select the preferred settlement expansion area and facilitate/support the necessary Official Plan Amendment for the Urban Area Expansion.*



Engineering Studies

Study Purpose: *To support the selection of the preferred settlement expansion area and identify the infrastructure requirements needed to support its development.*



Fire Station Location Study

Study Purpose: *To review the City's fire stations and fire protection services delivery model to identify the most efficient and effective model to serve the City's planned Urban Area (including this settlement expansion area) and meet all current best practices and standards.*



Parks & Recreation Master Plan

Study Purpose: *To develop a community-supported plan that provides the policy framework to manage, serve and support residents and visitors with the needed parks, open space, trails, recreation and leisure recreation facilities, services and programming in a cost effective and proactive manner.*

Project Timelines

	January to March 2019	March to April 2019	April to July 2019	July to September 2019		
	Phase 1: Background Existing Conditions	Phase 2: Evaluation of Alternatives	Phase 3: Preferred Alternative	Phase 4: Documentation		
		Coffee Conversations Public Event	Open House Event (WE ARE HERE)	Final Planning Justification Report	Statutory Public Meeting	City Council Presentation
	Phase 1: Background Existing Conditions	Phase 2: Evaluation of Alternatives	Phase 3: Preferred Alternative	Phase 4: Documentation		
				Final Municipal Servicing & Transportation Technical Memos		
	Phase 1: Background Existing Conditions	Phase 2: Evaluation of Alternatives	Phase 3: Preferred Alternative	Phase 4: Documentation		
				Final Fire Location Study Report		
	Phase 1: Background Existing Conditions	Phase 2: Department & Service Delivery Analysis	Phase 3: Parks & Facilities Analysis	Phase 4: Documentation		
		Launch of interactive mapping and online surveys for community input		Parks & Recreation Master Plan Open House	Final Parks & Rec Master Plan	Public Meeting

ST. THOMAS
THE RAILWAY CITY

Community Consultation

Public Engagement



Online survey responses:

- **430** for programming survey
- **174** for opportunities and constraints mapping

Dedicated Project email and website

44 attendees at Stakeholder Workshops for Parks & Recreation Master Plan

Project promoted through City's social media channels

What We've Heard

- **Municipal servicing** of adjacent areas and surrounding residents
- Protection and enhancement of **parks and natural heritage features**, along with **improved infrastructure** (i.e. splashpads, recreational facilities, etc.)
- Facilities and programming to support **local communities** (i.e. community centres)
- Increased **affordable housing**
- Use of **inclusionary zoning**
- Ensure **traffic flows** are maintained without congestion
- Need for more **recreational trails, park washrooms, parks and open space,** and **beautification**
- Increases in **community events, aquatic recreation, concerts,** and **programming** (i.e. volleyball) put on by the City

ST. THOMAS
THE RAILWAY CITY

Evaluation Criteria

Evaluation criteria used to evaluate the opportunities and constraints of each of the four settlement boundary expansion areas under consideration:

1. **Proximity to existing built-up area**
2. **Proximity to other planned areas, facilities, parks & open spaces**
3. **Housing**
4. **Land-use compatibility**
5. **Ease of development**
6. **Natural heritage**
7. **Surface & groundwater impacts**
8. **Agricultural impacts**
9. **Mineral & petroleum resources**
10. **Cultural heritage & archaeology**
11. **Natural hazards**
12. **Human-made hazards**
13. **Transit accessibility**
14. **Road improvements**
15. **Water improvements**
16. **Sanitary sewer system**
17. **Air quality and climate change**
18. **Overall capital costs**
19. **Cross-jurisdictional issues and opportunities**

ST. THOMAS
THE RAILWAY CITY

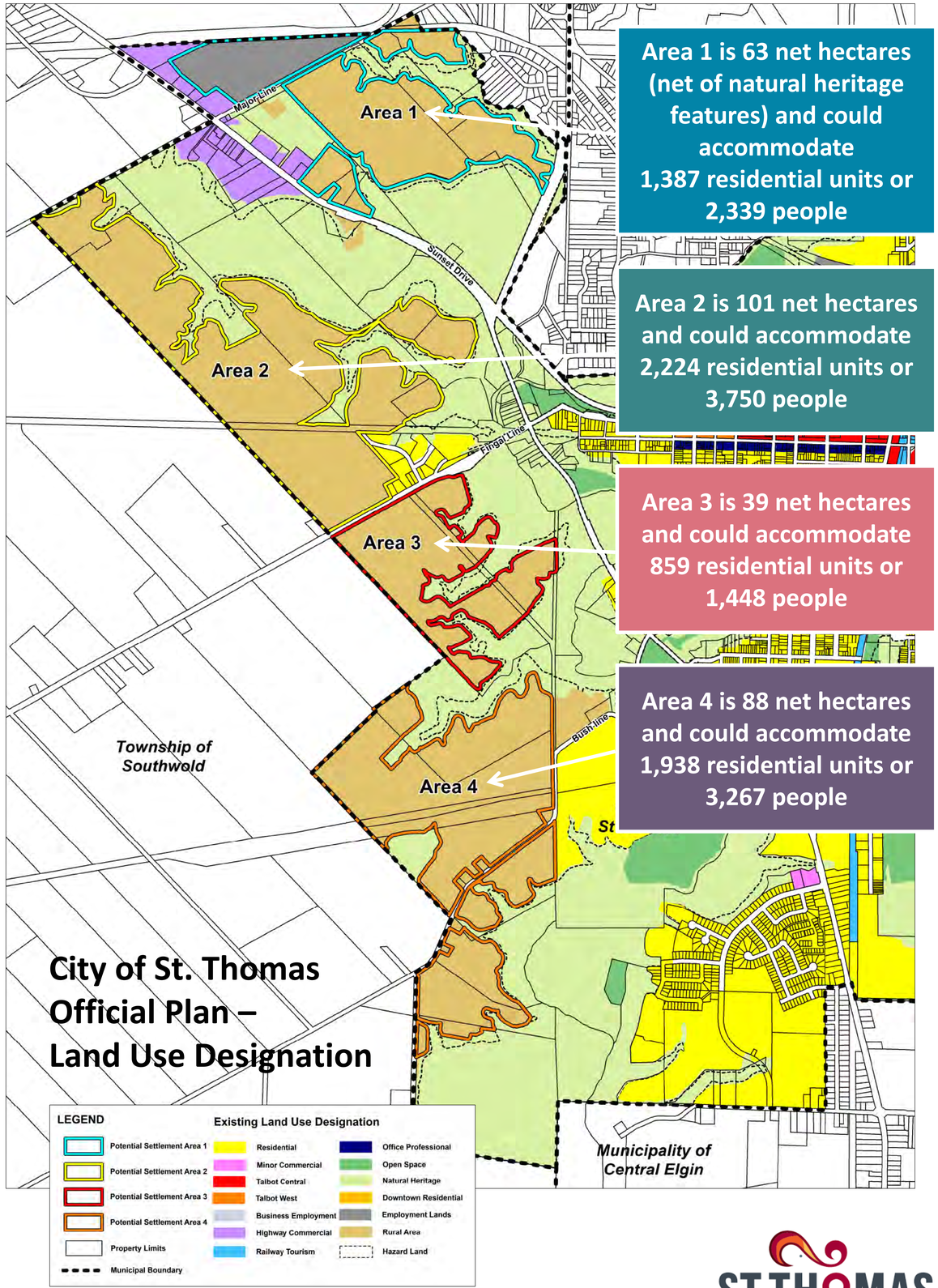
Evaluation Results

Land Supply

- **Areas 1, 2 & 4:** Provide sufficient land to accommodate demand to 2041
- **Area 3:** On its own, does not meet demand

Natural Heritage Features

- **All Areas:** Require buffers from natural heritage and assessment of species at risk
- **Area 1**: Natural heritage to south, east and west. Northern areas require buffer.
- **Area 2**: Natural heritage to the east. Several areas may be challenging to access while avoiding natural heritage and buffers.
- **Area 3**: Natural heritage to east and south. One area may be a challenge to access while avoiding natural heritage and buffers.
- **Area 4**: Natural heritage features to east, north and south. Several areas may not be feasible for development due to remaining amount of land once buffers are applied.



ST. THOMAS
THE RAILWAY CITY

Evaluation Results

Natural & Human-Made Hazards

- **All Areas:** Require assessments at time of development including flood/erosion hazards, Phase 1 ESA to confirm environmental soils conditions, and an archaeological assessment

Agricultural Impacts

- **All Areas:** Include Prime Agricultural Land with several active livestock operations within or around the subject areas:
  - **Area 1:** Not likely to trigger minimum distance separation requirements
  - **Area 2 & 3:** Will trigger minimum distance separation requirements and other mitigation measures to manage land use conflict
  - **Area 4:** Likely trigger minimum distance separation from the City's existing Wastewater Treatment Plant on Bush Line and Sunset Drive

Road Improvements

- **All Areas:** Localized improvements may be necessary to facilitate traffic access.
- **Area 1:** Current road capacity could accommodate the development of Area 1, however if widening or upgrading is needed, could be accommodated within right-of-way
- **Area 2 & 3:** Have access from Fingal Line (Major Arterial Road). Upgrading of this road is highly constrained by the bridge at Sunset Drive. Additional capacity may be required to accommodate Area 2. Sunset Drive south of Talbot Hill may also need improvements.
- **Area 4:** Has access from Bush Line (Local Road), which may require upgrades and additional capacity. Sunset Drive south of Talbot Hill may need improvements.

ST. THOMAS
THE RAILWAY CITY

Evaluation Results

Water Improvements

- **All Areas:** None are currently serviced:
  - **Area 1:** Close proximity with potential to connect to secondary water supply*. Some properties on Sunset Dr. may benefit from extension of municipal water servicing.
  - **Area 2 & 3:** May be able to connect to the City or Southwold systems*
  - **Area 4:** Furthest from potential connections. Could connect to the City system but may be difficult to loop.

Sanitary Improvements

- **All Areas:** Require pump station to cross creek:
  - **Area 1:** Requires second pump station and potential upgrades to increase capacity. Sanitary servicing could be sized to accommodate both Area 2 and 3 and could extend services to existing uses along Sunset Drive and Major Line.
  - **Area 2 & 3:** Serviced together with potential to service by gravity along Fingal Line. Potential upgrades needed to increase capacity of Sunset Pump Station and forcemain.

Transit & Active Transportation

- **All Areas:** Could be connected to the transit network with good to moderate active transportation opportunities:
  - **Area 1:** Good opportunity for a multi-use trail connecting to north of Downtown
  - **Area 2:** Good opportunity to connect to active transportation network due to proximity to Trans Canada trail
  - **Area 3:** Moderate opportunity to connect to active transportation network due to proximity to Elgin hiking trail and abandoned rail corridor
  - **Area 4:** Moderate opportunity to connect to active transportation network due to proximity to Elgin hiking trail

ST. THOMAS
THE RAILWAY CITY

Evaluation Results

Order of Magnitude Costs

Area 1	Area 2	Area 3	Area 4
Water: Highest, longer watermain to adequately service area from multiple connections.	**Water: Lowest**, within close proximity to sufficient connections.	**Water: Lowest**, within close proximity to sufficient connections.	**Water: Lowest**, within close proximity to sufficient connections.
Wastewater: Highest, would require additional infrastructure, sanitary sewer, and a sanitary pump station to cross creek.	**Wastewater: Mid**, requires sanitary sewer extension, new pump station to cross creek, and upgrades to current pump station and forcemain.	**Wastewater: Mid**, requires sanitary sewer extension, new pump station to cross creek, and upgrades to current pump station and forcemain.	**Wastewater: Lowest**, requires sanitary sewer extension and a new pump station to cross creek.
Roads: Lowest, anticipated to be able to accommodate demand in excess capacity in the existing road network.	**Roads: Highest**, additional capacity may be required on Fingal Line.	**Roads: Lowest**, anticipated to be able to accommodate demand in excess capacity in the existing road network.	**Roads: Highest**, additional capacity may be required on Bush Line.

ST. THOMAS
THE RAILWAY CITY

Summary of Evaluation

✓ Preferred ● Neutral/Mid Range ✗ Least preferred

	Area 1	Area 2	Area 3	Area 4
Proximity to built up area and other facilities	✓	●	●	●
Housing	✓	✓	✗	✓
Agricultural Impacts	✓	✗	✗	✗
Road Improvements	✓	✓	✓	✗
Water Improvements	✓	●	●	✗
Sanitary Servicing	✗	●	●	✓
Overall Capital Costs	●	✓	✓	✗

Several evaluation criteria themes did not have significant variations when applied to the four areas:

1. Land Use Compatibility
2. Ease of Development
3. Natural Heritage
4. Surface and Groundwater
5. Mineral and Petroleum Resources
6. Cultural Heritage and Archaeology
7. Natural Hazards
8. Human Made Hazards
9. Transit and Active Transportation
10. Emergency Services
11. Air Quality and Climate Change
12. Cross Jurisdictional

Preliminary Preferred Area



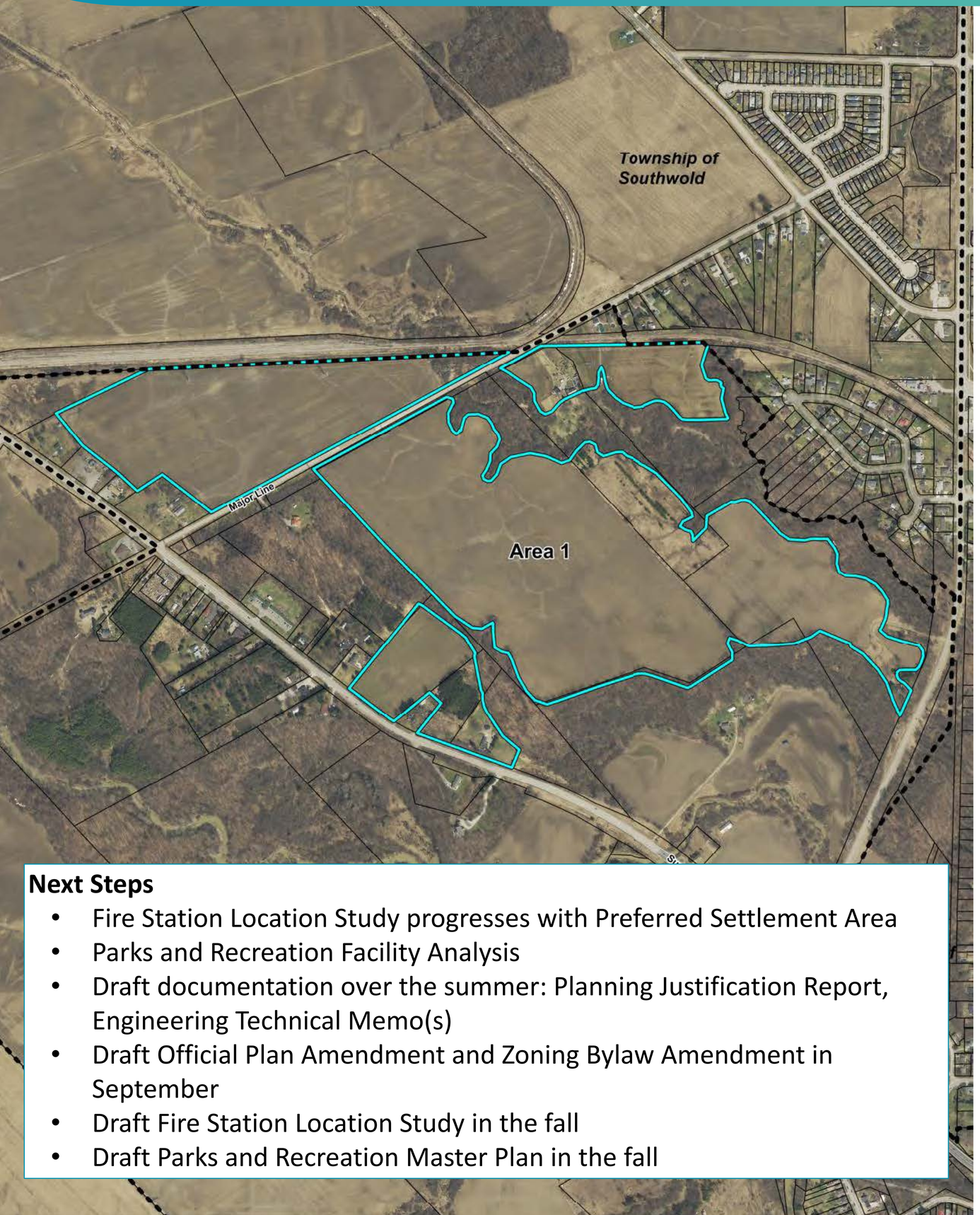
Area 1 is identified as the preliminary preferred area.

Benefits include:

- Is in proximity to the existing built area and the most contiguous with the existing community
- Utilizes the City's existing road network and capacity
- Provides good access to Highway 401, London, adjacent communities and Downtown
- Would support the extension of servicing to the existing Highway Commercial and Residential Lands along Sunset Drive and Major Line
- Municipal servicing could be oversized to accommodate Area 2 and 3 in the future

ST. THOMAS
THE RAILWAY CITY

Give us your input



Next Steps

- Fire Station Location Study progresses with Preferred Settlement Area
- Parks and Recreation Facility Analysis
- Draft documentation over the summer: Planning Justification Report, Engineering Technical Memo(s)
- Draft Official Plan Amendment and Zoning Bylaw Amendment in September
- Draft Fire Station Location Study in the fall
- Draft Parks and Recreation Master Plan in the fall

What are your thoughts on Area 1 as the preliminary preferred area?

Provide us with your feedback directly on the map, in the space provided below, or by filling out a comment form.

ST. THOMAS
THE RAILWAY CITY

Attachment A2

Evaluation Criteria

1. PROXIMITY TO EXISTING BUILT-UP AREA	*Is the settlement expansion area adjacent to the existing built-up areas to allow for the efficient use of land, infrastructure and public service facilities?*
2. PROXIMITY TO OTHER PLANNED AREAS FACILITIES, PARKS & OPEN SPACES	*Can the settlement expansion area be effectively serviced by existing public facilities?* *Does the settlement expansion area support closer live/work play connections?* *Is there an existing or planned active transportation network that will support the settlement expansion area?*
3. LAND USE COMPATIBILITY	*Is the settlement expansion area appropriately buffered/separated from industries and other major facilities/infrastructure to prevent adverse environmental effects and minimize risk to public health and safety?*
4. HOUSING	*Does the settlement expansion area provide sufficient land to meet the City's long term housing demand?*
5. EASE OF DEVELOPMENT	*Are there physical or other known constraints that would impact the ease of development?*
6. NATURAL HERITAGE	*Does the settlement expansion area provide buffers to significant natural features? Does the settlement expansion area avoid known locations of species at risk?*
7. SURFACE & GROUNDWATER	*Does the settlement expansion area have the potential to disturb sensitive and/or vulnerable surface water and ground water resources via existing surface or tile drainage systems**?***
8. AGRICULTURAL IMPACTS	*Does the settlement expansion area avoid prime agricultural lands or contain lower priority prime agricultural lands? Is the settlement expansion area adjacent to or in close proximity to existing agricultural operations or active livestock operations?*
9. MINERAL & PETROLEUM RESOURCES	*Does the settlement expansion area contain mineral or petroleum resources?*
10. CULTURAL HERITAGE & ARCHAEOLOGY	*Does the settlement expansion area contain significant cultural heritage landscapes?*
11. NATURAL HAZARDS	*Is the settlement expansion area subject to flooding, erosion or other natural hazards?*
12. HUMAN-MADE HAZARDS	*Does the settlement expansion area contain human made hazards such as environmental soils contamination?*
13. TRANSIT AND ACTIVE TRANSPORTATION	*Can the settlement expansion are be efficiently served by existing or future/planned transit service?*
14. ROAD IMPROVEMENTS	*Can the settlement expansion area be efficiently served by municipal road network?*
15. WATER IMPROVEMENTS	*Can the settlement expansion area be efficiently serviced with municipal water services? Are there benefits to the extension of municipal water services for other properties?*

16. SANITARY SEWER SYSTEM	*Can the settlement expansion area be efficiently serviced with municipal sanitary sewage services? Are there benefits to the extension of municipal sanitary sewage services for other properties?*
17. EMERGENCY SERVICES	*Can emergency services be efficiently delivered to the settlement expansion area?*
18. AIR QUALITY AND CLIMATE CHANGE	*Does the selection of the settlement expansion area minimize the negative impacts of air quality, climate change or promote energy efficiency?*
19. OVERALL CAPITAL COSTS	*What are the order of magnitude costs associated with servicing the settlement expansion area?*
20. CROSS JURISDICTIONAL	*Are there any known cross jurisdictional issues or opportunities that may impact the viability of the land to be developed?*

Attachment A3

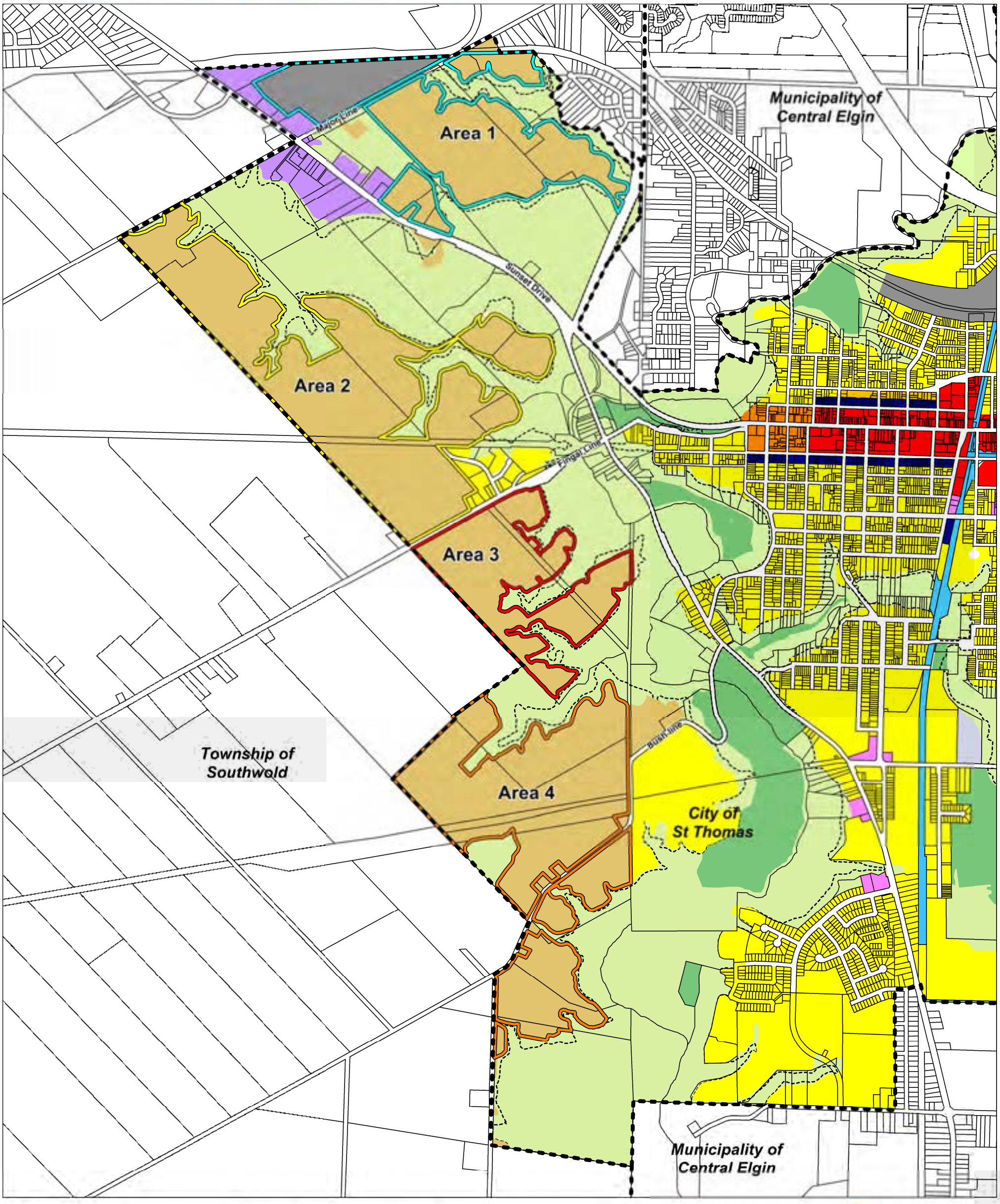
Existing Conditions Figures

DILLON CONSULTING

City of St Thomas Settlement Expansion

Existing Official Plan Land Use Designations

City of St Thomas Official Plan Land Use Designations



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary

Existing Land Use Designation

- Residential
- Minor Commercial
- Talbot Central
- Talbot West
- Business Employment
- Highway Commercial
- Railway Tourism
- Office Professional
- Open Space
- Natural Heritage
- Downtown Residential
- Employment Lands
- Rural Area
- Hazard Land

DILLON CONSULTING

ST. THOMAS THE RAILWAY CITY

N

250 0 250 500 750

Metres

Last Revised March 13, 2019

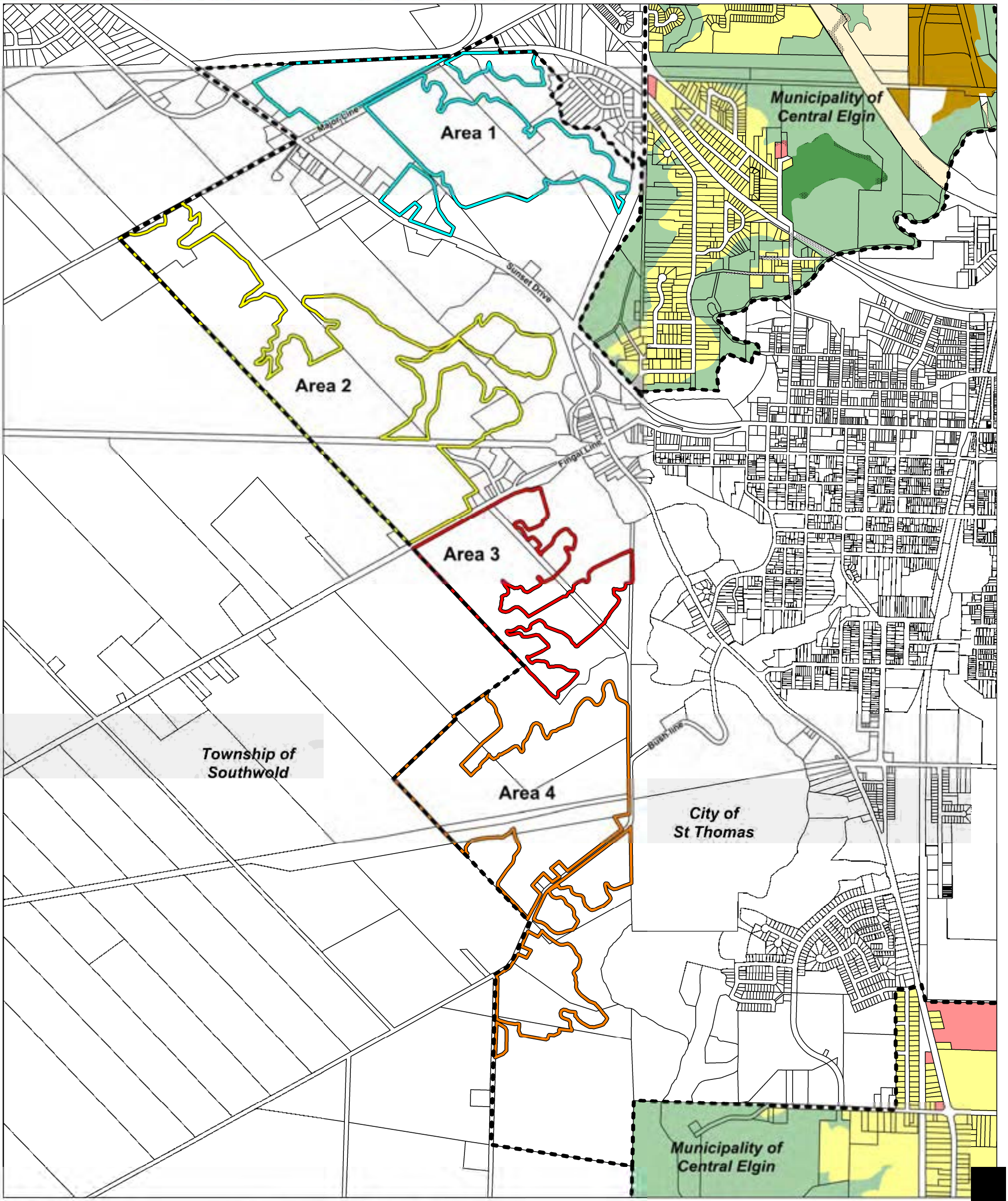
Air Photography 2015

City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Existing Official Plan Land Use Designations

Municipality of Central Elgin Official Plan Land Use Designations



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary

Existing Land Use Designation

- Residential
- Local Commercial
- Community Facility
- Rural Development Area
- Agricultural
- Hazard Lands

DILLON CONSULTING

ST. THOMAS THE RAILWAY CITY

N

250 0 250 500

Metres

Last Revised March 13, 2019

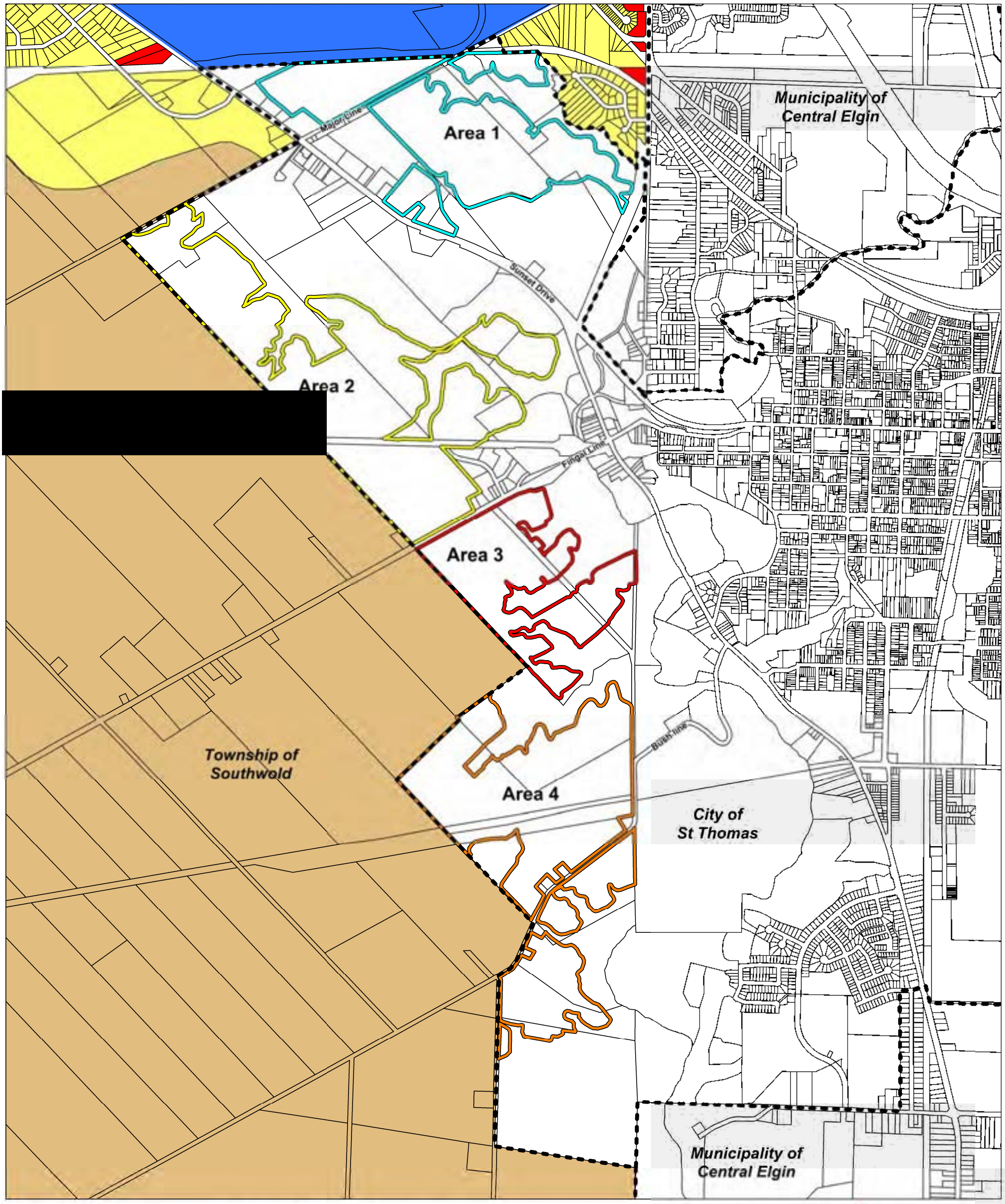
Air Photography 2015

City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Existing Official Plan Land Use Designations

Township of Southwold Official Plan Land Use Designations



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary

Existing Land Use Designation

- Residential
- Open Space
- Industrial
- General Commercial
- Agricultural

DILLON CONSULTING

ST. THOMAS THE RAILWAY CITY

N

250 0 250 500 750

Metres

Last Revised March 13, 2019

Air Photography 2015

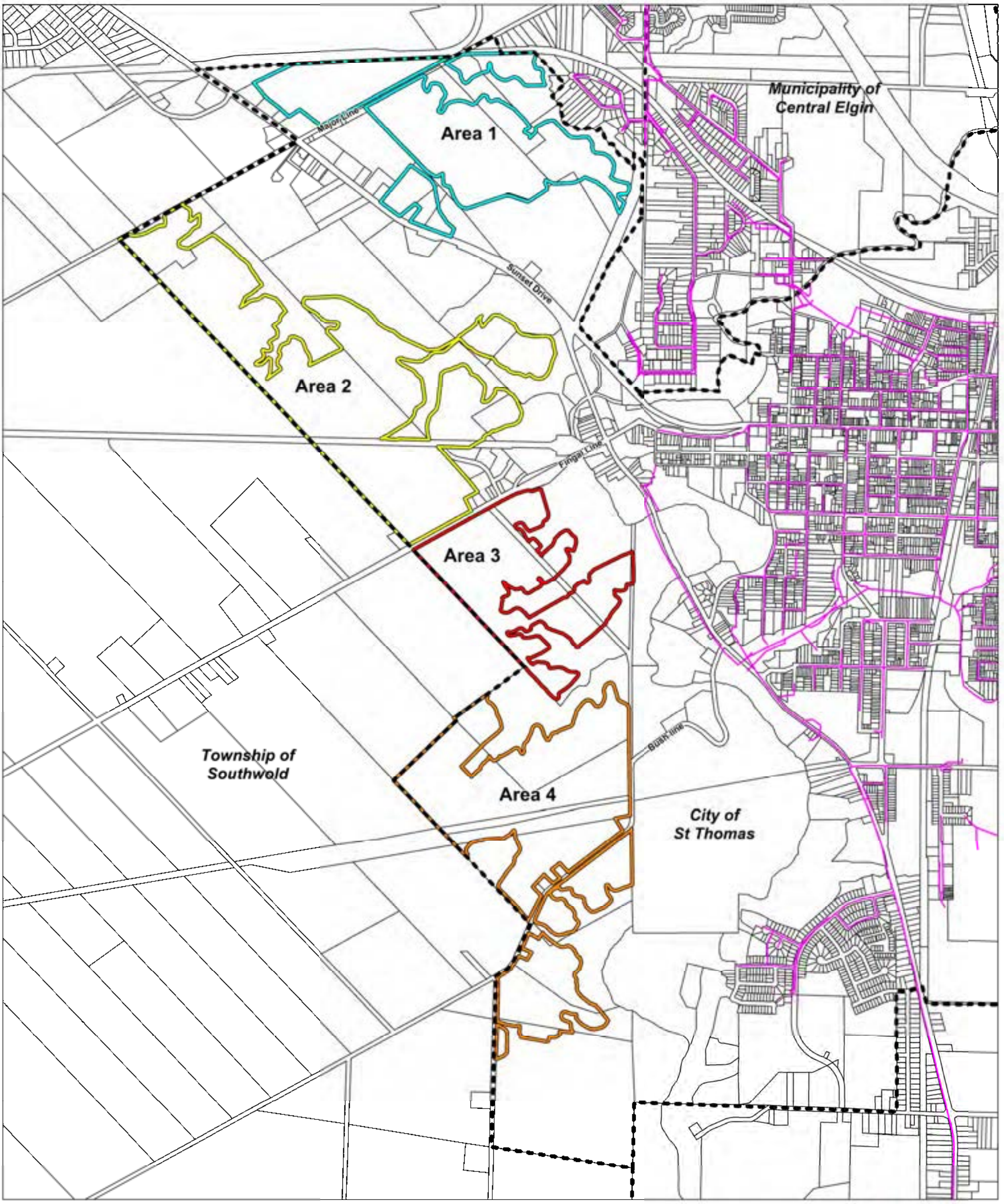
City of St Thomas Planning & Building Services

(Township of Southwold Official Plan

City of St Thomas Settlement Expansion

Municipal Servicing

Existing Sanitary Sewer Infrastructure



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary
- Existing Sanitary Sewer

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

250 0 250 500 750

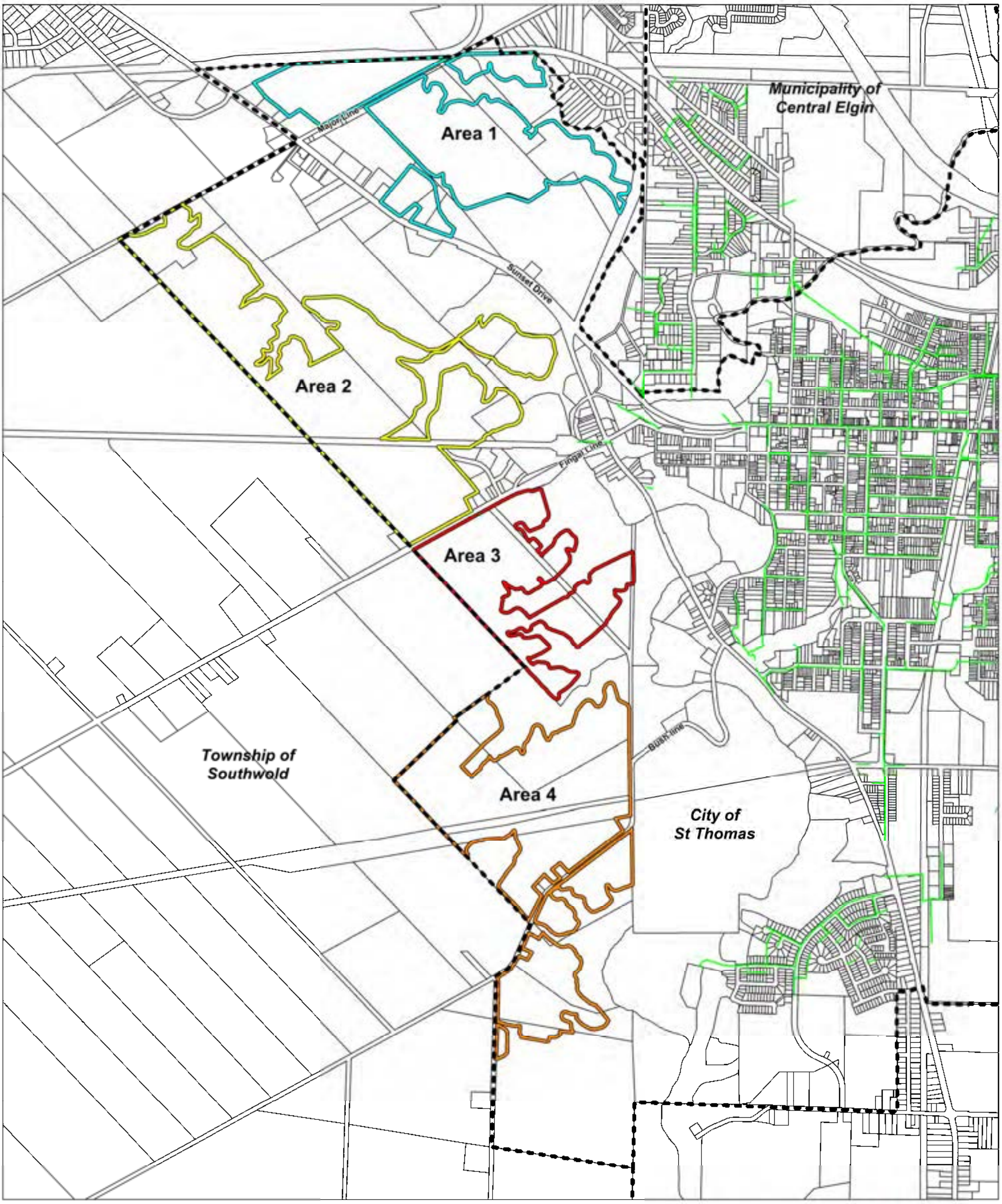
Metres

Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Municipal Servicing

Existing Stormwater Sewer Infrastructure



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary
- Existing Stormwater Sewer

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

250 0 250 500 750

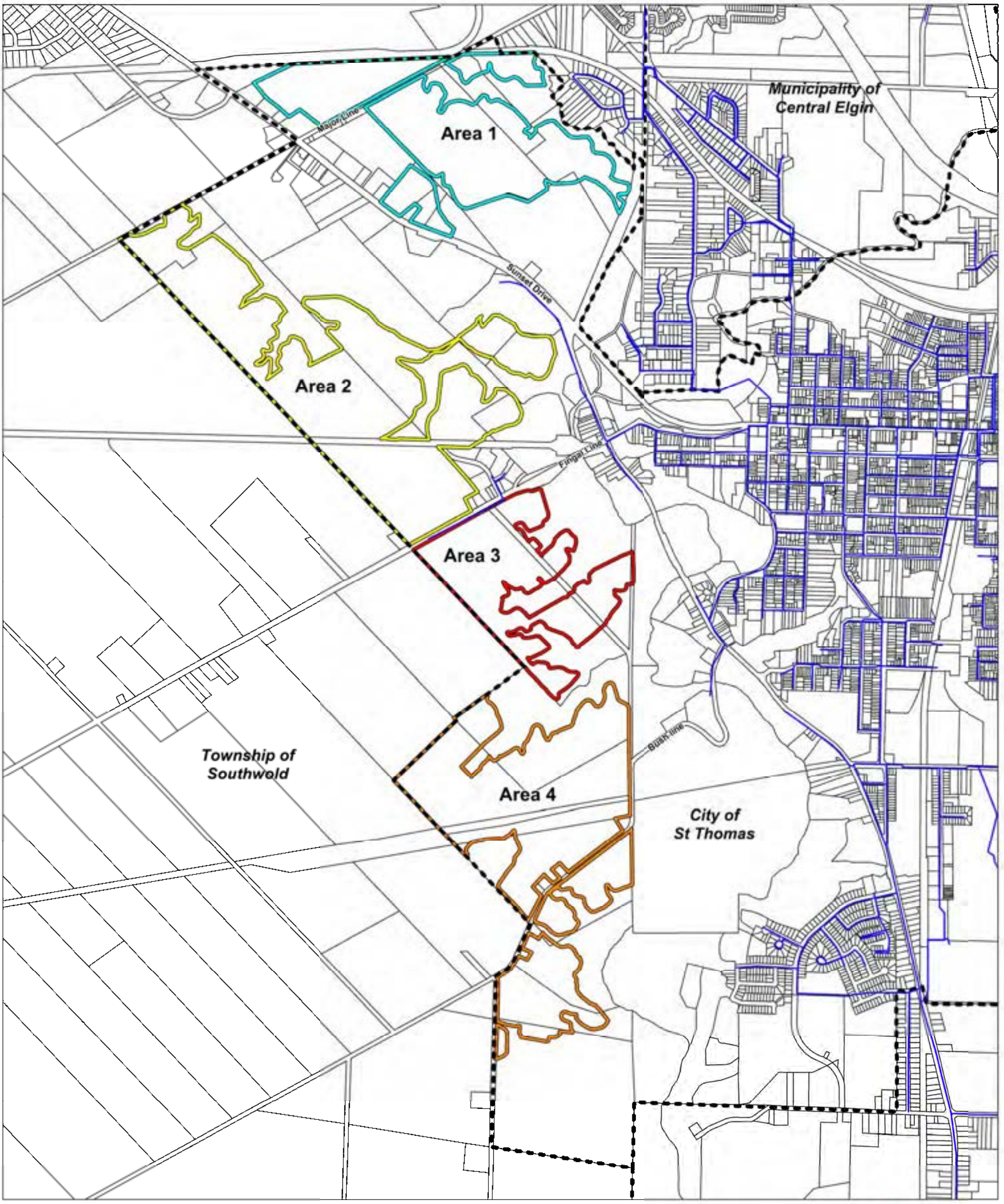
Metres

Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Municipal Servicing

Existing Watermain Infrastructure



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary
- Existing Watermain

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

250 0 250 500 750

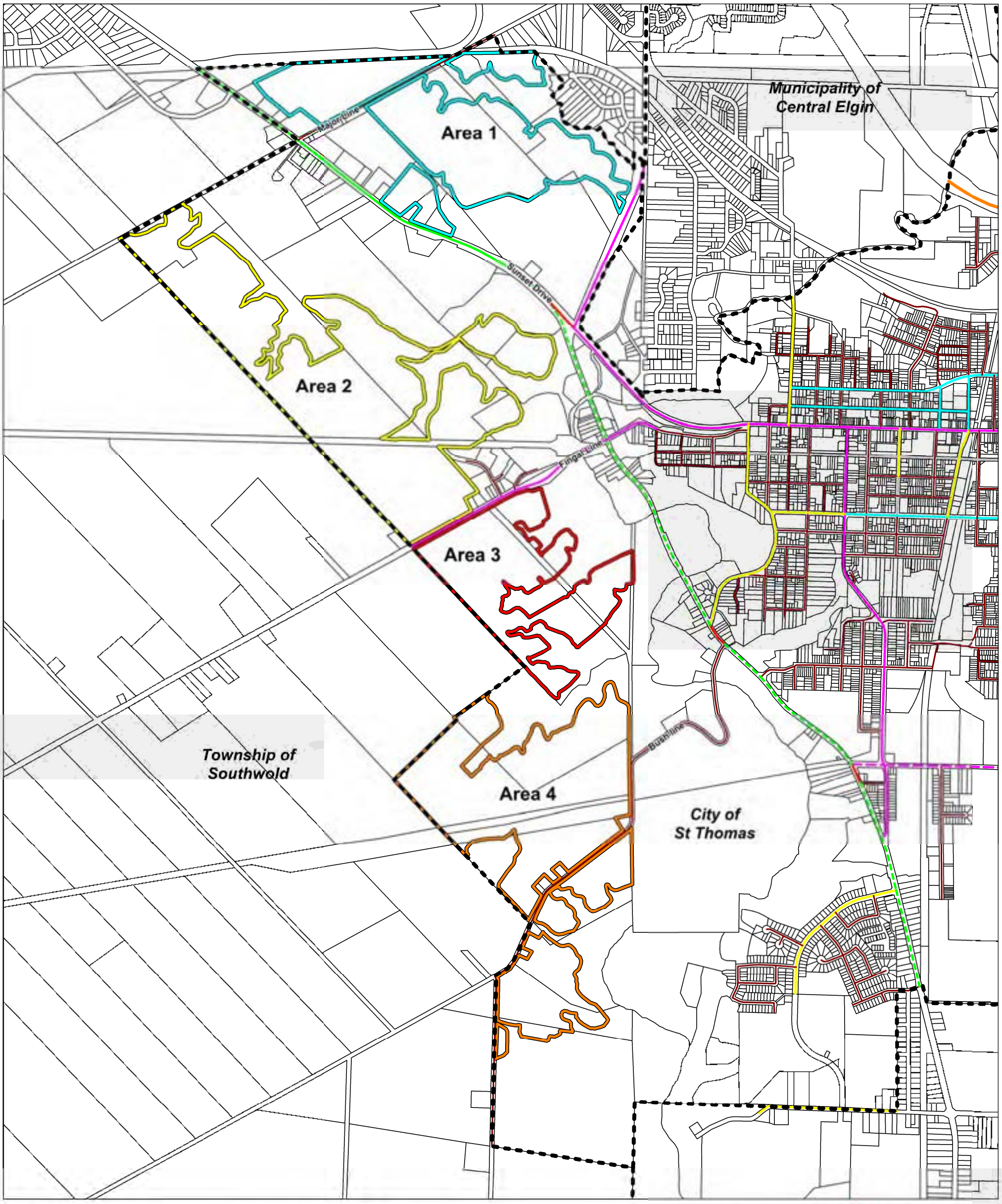
Metres

Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Transportation Infrastructure

Existing Transportation Infrastructure



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary

Existing Infrastructure

- Highway Major County Road
- Highway Major County Road Bike Lane
- Local
- Major Arterial
- Major Arterial Bike Lane
- Major Collector
- Minor Arterial
- Minor Arterial Bike Lane
- Minor Collector
- Provincial Highway

DILLON CONSULTING

ST. THOMAS THE RAILWAY CITY

N

250 0 250 500 750

Metres

Last Revised March 13, 2019

Air Photography 2015

City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Potential Settlement Expansion Areas

Area 1



LEGEND

- Potential Settlement Area 1
- Property Limits
- Municipal Boundary

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

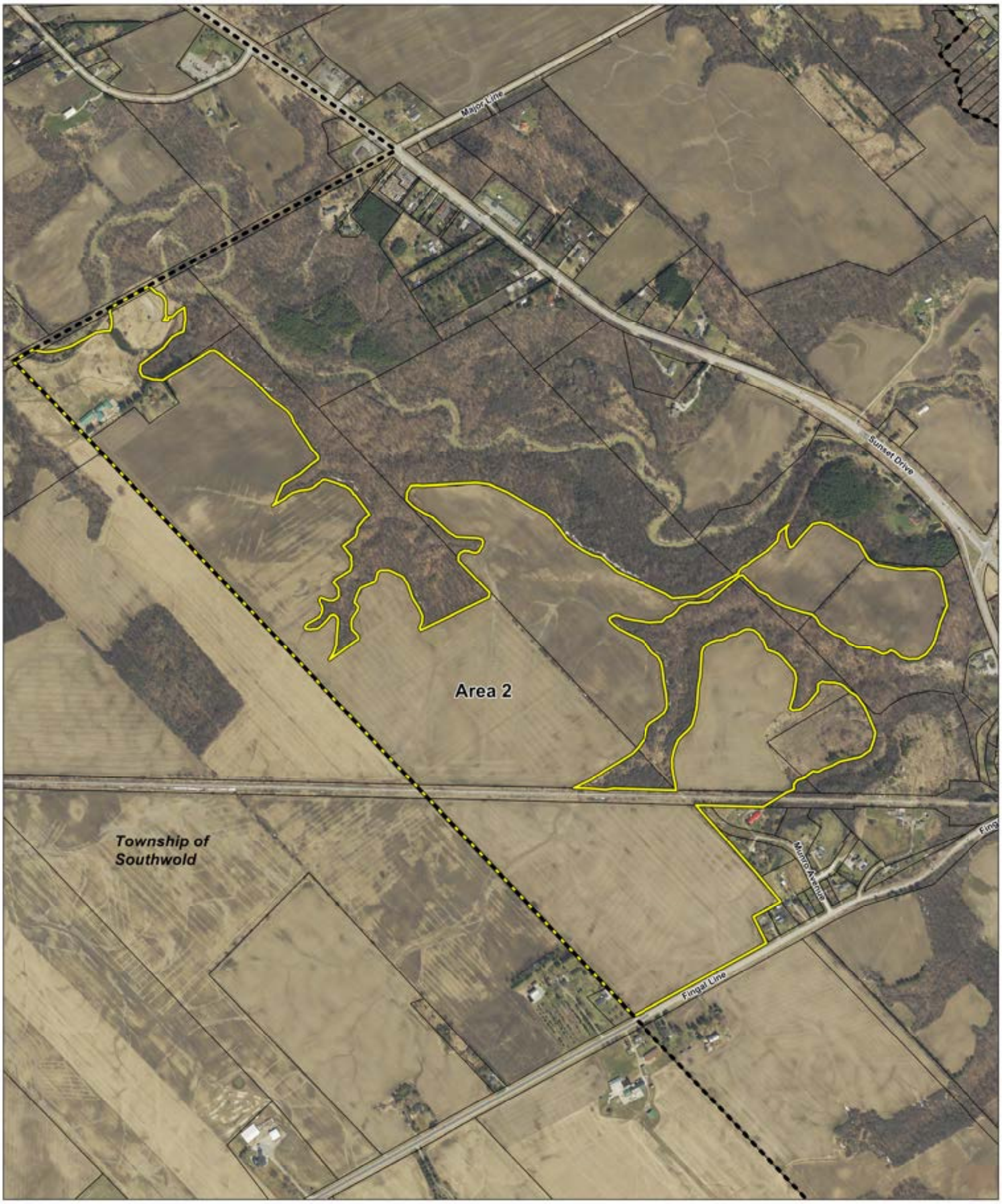
250 0 250 500 750

Metres
Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Potential Settlement Expansion Areas

Area 2



LEGEND

- Potential Settlement Area 2
- Property Limits
- Municipal Boundary

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

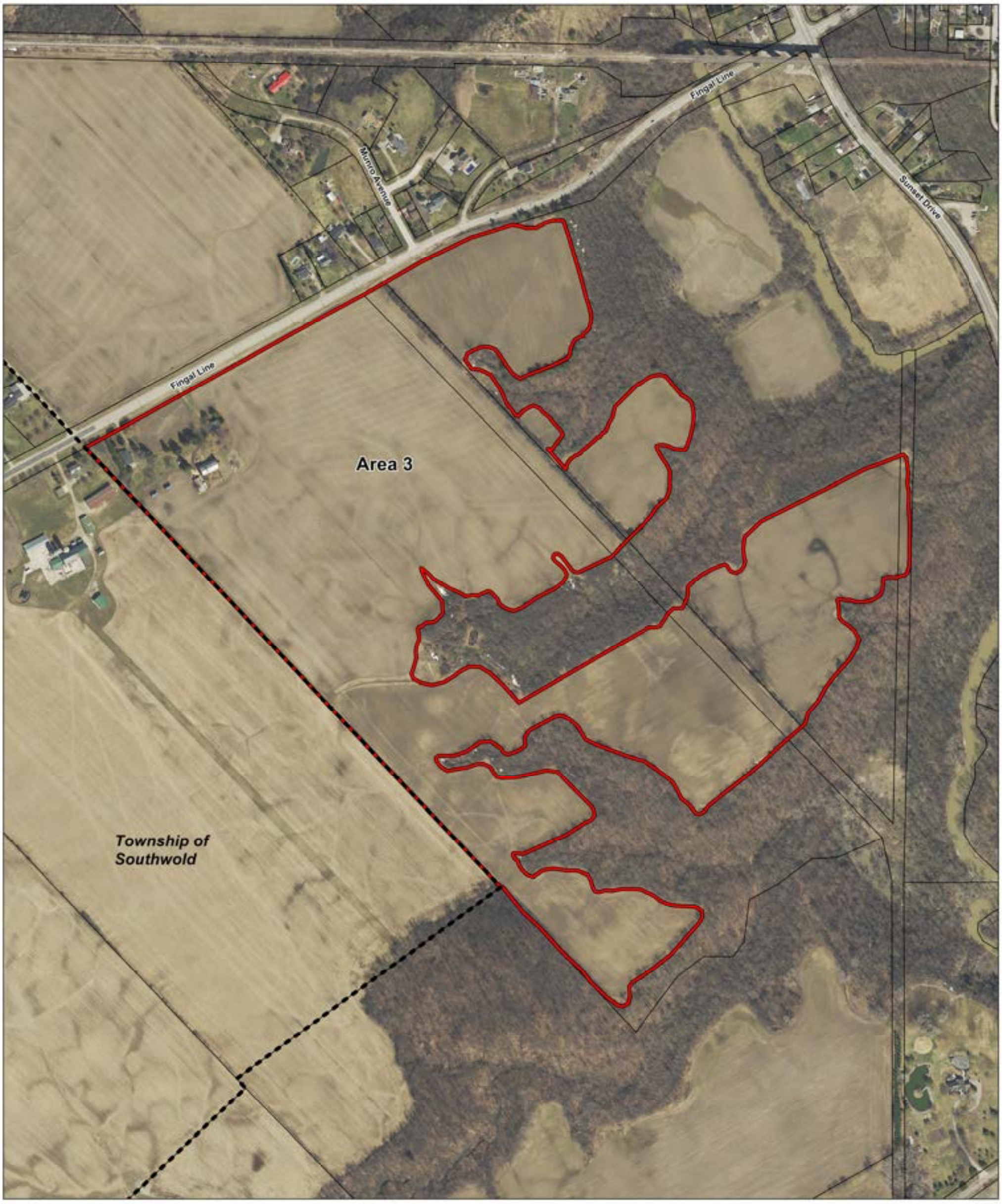
250 0 250 500 750

Metres
Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Potential Settlement Expansion Areas

Area 3



LEGEND

- Potential Settlement Area 3
- Property Limits
- Municipal Boundary

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

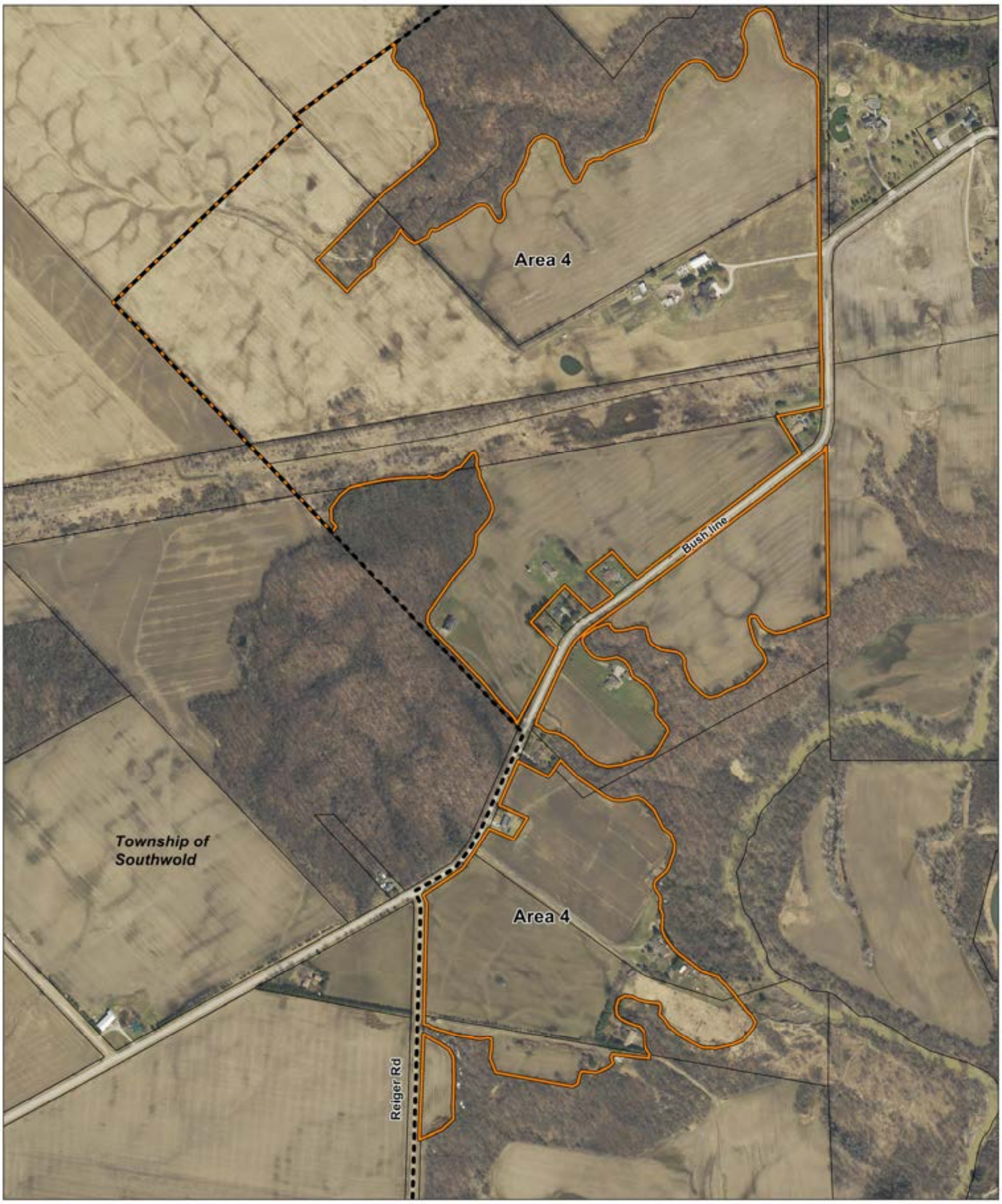
75 0 75 150 225

Metres
Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Potential Settlement Expansion Areas

Area 4



LEGEND

- Potential Settlement Area 4
- Property Limits
- Municipal Boundary

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

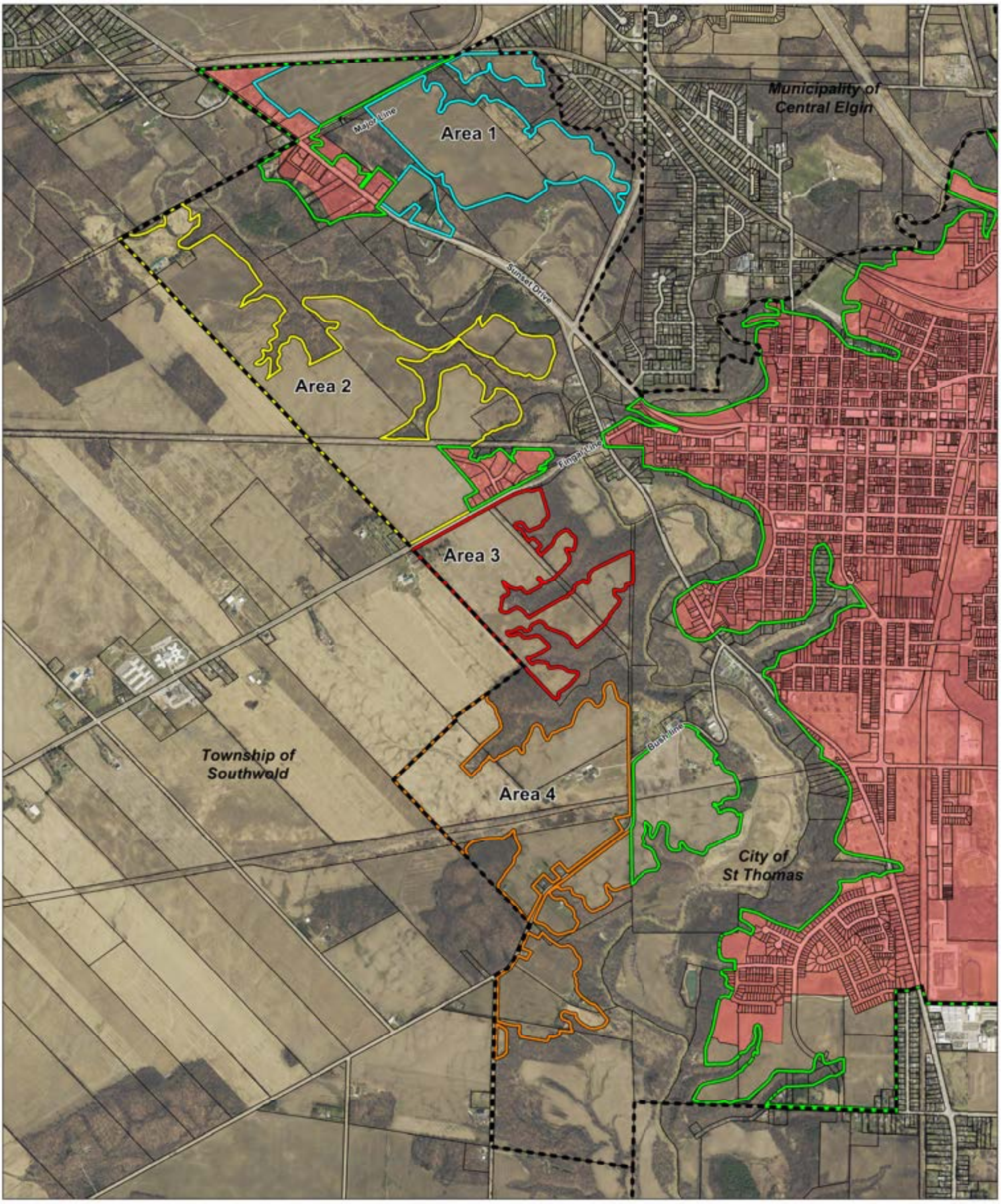
75 0 75 150 225

Metres
Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

City of St Thomas Settlement Expansion

Settlement Areas

Existing and Potential Settlement Expansion Areas



LEGEND

- Potential Settlement Area 1
- Potential Settlement Area 2
- Potential Settlement Area 3
- Potential Settlement Area 4
- Property Limits
- Municipal Boundary
- Existing Built Area
- Existing Settlement Limits

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

250 0 250 500 750

Metres
Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

Attachment A4

Potential Settlement Area Analysis Results

DILLON CONSULTING

Study Area		Area 1	Area 2	Area 3	Area 4
Land Area (Ha) (net of natural heritage)		**63**	**101**	**39**	**88**
Average Units per Ha (Watson Pop & Housing Forecast)		22	22	22	22
Estimated Housing Units		1387	2224	859	1938
Estimated Population (PPU from Watson)		2339	3750	1448	3267
Housing Demand		1048	1048	1048	1048
Housing Surplus/Deficit		339	1176	-189	890
PHASE 1 EVALUATION					
1. PROXIMITY TO EXISTING BUILT-UP AREA	*Is the settlement expansion area adjacent to the existing built-up areas to allow for the efficient use of land, infrastructure and public service facilities?*	The area is not contiguous to the existing built area of St Thomas. Area 1 is in close proximity to existing built-up areas (including the designated Highway Commercial lands along Sunset Drive and the Lynhurst neighbourhood in Central Elgin).	The area is not contiguous to the existing built area of St Thomas. Area 2 and 3 are in close proximity to existing built up area designated Residential on Munro Avenue.	The area is not contiguous to the existing built area of St Thomas. Area 2 and 3 are in close proximity to existing built up area designated Residential on Munro Avenue.	The area is not contiguous to the existing built area of St Thomas. Area 4 is in close proximity to vacant lands designated for residential development (south side of Bush Line). Area 4 is in close proximity to the vacant designated Residential lands south of Bush Line.
2. PROXIMITY TO OTHER PLANNED AREAS FACILITIES, PARKS & OPEN SPACES	*Can the settlement expansion area be effectively serviced by existing public facilities? Does the settlement expansion area support closer live/work play connections? Is there an existing or planned active transportation network that will support the settlement expansion area?*	Area 1 is in proximity to community parks (Cowan Park and Athletic Park), but will require neighbourhood park(s) to serve local residents. Indoor recreation facilities are not likely to be required given estimated population and peripheral location. Area is not linked to trails network, but could benefit from potential future connection along rail corridor to the north (not identified in Trails/Cycling Plans). The 2014 Cycling Master Plan proposed an on-road cycling route along both Sunset Drive (paved shoulder) and Major Line (signed route).	Area 2 is not in close proximity to parks and will require neighbourhood park(s) to serve local residents. Indoor recreation facilities are not likely to be required given estimated population and peripheral location. The abandoned rail corridor that bisects the site (proposed as a multi-use trail in the 2014 Cycling Master Plan) provides an excellent opportunity to connect with the Elevated Park (privately-owned) and then westward to Downtown along the Great Trail. The area offers nearby connections to the Elgin Hiking Trail (private lands) along the west side of Kettle Creek.	Area 3 is not in close proximity to parks and will require neighbourhood park(s) to serve local residents. Indoor recreation facilities are not likely to be required given estimated population and peripheral location. The area offers nearby connections to the Great Trail / Elevated Park and Elgin Hiking Trail (private lands).	Area 4 is not in close proximity to parks and will require neighbourhood park(s) to serve local residents. Indoor recreation facilities are not likely to be required given estimated population and peripheral location. The area is bisected by Bush Line, which is currently part of the Great Trail; the 2014 Cycling Master Plan proposed an on-road cycling route along Bush Line (signed route).
3. LAND USE COMPATIBILITY	*Is the settlement expansion area appropriately buffered/separated from industries and other major facilities/infrastructure to prevent adverse environmental effects and minimize risk to public health and safety?*	Area 1 includes lands designated Employment (north of Major Line) and is adjacent to lands designated for industrial uses (to the north in Southold). These lands are currently vacant and include an existing rail on the north side. Appropriate buffers from the rail corridor would be required.	Area 2 is adjacent to lands designated Natural Heritage to the east and Residential to the south/east (City of St Thomas OP) and Agricultural to the west (Township of Southwold OP). Livestock operations are permitted in the Agricultural lands to the west and there is an existing livestock operation on the north portion of Area 2 which would impact development of residential on the subject lands (see criteria 8 below).	Area 3 is adjacent to lands designated Natural Heritage to the east (City of St Thomas OP) and Agricultural to the west (Township of Southwold OP). Livestock operations are permitted in the Agricultural lands to the west, which could impact development of residential on the subject lands (see criteria 8 below).	Area 4 is adjacent to lands designated Natural Heritage to the north and south, Residential to the east (City of St Thomas OP) and Agricultural to the west (Township of Southwold OP). Livestock operations are permitted in the Agricultural lands to the west which could impact development of residential on the subject lands (see criteria 8 below).
4. HOUSING	*Does the settlement expansion area provide sufficient land to meet the City's long term housing demand?*	Area 1 should provide sufficient land to accommodate the residential demand to 2041, subject to the ability to develop the entire area.	Area 2 should provide sufficient land to accommodate the residential demand to 2041, subject to the ability to develop the entire area.	On its own, Area 3 does not provide sufficient land to accommodate the residential demand to 2041.	Area 4 should provide sufficient land to accommodate the residential demand to 2041, subject to the ability to develop the entire area.
5. EASE OF DEVELOPMENT	*Are there physical or other known constraints that would impact the ease of development?*	Area 1 has several development constraints including: - four pieces of land in separate ownership with access needs and some assembly of land required - adjacent rail corridor to the north and two hydro	Area 2 has several development constraints including: - former rail corridor with different owner bisecting the subject lands - several areas that have narrow or no access options	Area 3 has several development constraints including: - several areas that have narrow access options without impacting the natural	Area 4 has several development constraints: - former rail corridor with different owner bisecting the subject lands, possible environmental soils constraints

Study Area		Area 1	Area 2	Area 3	Area 4
		corridors may require buffers/setback	without impacting the natural heritage system - steep topography to the east	heritage system - developable area constrained by presence of natural heritage features	- four separate pieces of land in multiple ownership with access needs and some assembly of land required
6. NATURAL HERITAGE	*Does the settlement expansion area provide buffers to significant natural features? Does the settlement expansion area avoid known locations of species at risk?*	At the time of development, specific buffers will need to be confirmed for the natural heritage features and the specific location of any species at risk within and around the settlement expansion areas. A Scoped Environmental Impact Assessment will be required for any development proposed within those buffers. Area 1 is surrounded by Natural Heritage features to the south, east and west of the three areas of land designated Rural Areas south of Major Line. The lands north of Major Line have limited Natural Heritage features identified that will require a buffer.	At the time of development, specific buffers will need to be confirmed for the natural heritage features and the presence of any species at risk within and around the settlement expansion areas. An Environmental Impact Assessment will be required for any development proposed within those buffers. Area 2 is surrounded by Natural Heritage features to the east. Several areas of land will not be accessible when avoiding Natural Heritage features and their buffers.	At the time of development, specific buffers will need to be confirmed for the natural heritage features and the presence of any species at risk within and around the settlement expansion areas. An Environmental Impact Assessment will be required for any development proposed within those buffers. Area 3 is surrounded by Natural Heritage features to the east and south. One area of land is likely to not be accessible when avoiding Natural Heritage features and their buffers.	At the time of development, specific buffers will need to be confirmed for the natural heritage features and the presence of any species at risk within and around the settlement expansion areas. An Environmental Impact Assessment will be required for any development proposed within those buffers. Area 4 is surrounded by Natural Heritage features to the east, north and south. Several areas may not be developable due to remaining amount of land once buffers are applied.
7. SURFACE & GROUNDWATER	*Does the settlement expansion area have the potential to disturb sensitive and/or vulnerable surface water and ground water resources via existing surface or tile drainage systems**?***	At the time of development a headwater drainage system review will be required to confirm the location and outlets of tile drainage systems. Dodd's Creek would be the outfall for groundwater associated with Area 1.	At the time of development a headwater drainage system review will be required to confirm the location and outlets of tile drainage systems. Kettle Creek would be the outfall for groundwater associated with Area 2.	At the time of development a headwater drainage system review will be required to confirm the location and outlets of tile drainage systems. Kettle Creek would be the outfall for groundwater associated with Area 3.	At the time of development a headwater drainage system review will be required to confirm the location and outlets of tile drainage systems. Kettle Creek would be the outfall for groundwater associated with Area 4.
8. AGRICULTURAL IMPACTS	*Does the settlement expansion area avoid prime agricultural lands or contain lower priority prime agricultural lands? Is the settlement expansion area adjacent to or in close proximity to existing agricultural operations or active livestock operations?*	The soil type in the upland areas of Area 1 have been identified as Gobles loamy phase which has a high water holding capacities, and moderate to rapid surface runoff. These soils are rated as Class 2D for common field crops when topography in not a limitation (Schut, 1992). Therefore, all areas with exception of the eroded channel are considered prime agricultural land (i.e. Class 2). Area 1 includes a potential existing active livestock operation on the north east quadrant of settlement expansion area and another just outside of the area. Based on a preliminary assessment of these sites, it is unlikely that they will have an impact on the viability of future development in Area 1.	The soil type in the upland areas of Area 2 is dominated by Gobles silty clay loam or clay loam textures with Fox sandy loam or loamy sand in the northern portion, and Berrien Till Phase in the southwest corner. The Berrien Till phases are considered Class 1 where topography is level, but become Class 2 to 3 as the topography becomes more severe. Both Fox and Gobles are considered Class 2FM or 2D. Area 2 includes a large existing active livestock operation within the north end of the settlement expansion area and several just outside of the area. Based on a preliminary assessment of these sites, it is anticipated that future development will have to consider a minimum separation distance and other mitigation measures to manage land use conflicts. Further analysis will be required prior to development to confirm the extent of impacted lands.	Gobles silty clay loam or clay loam dominates the upland portion of Area 3 with Berrien Till Phase in the northwest corner. Again, Gobles is considered Class 2, while the Berrien Till Phase is considered Class 1. Area 3 includes a large existing active livestock operation on the north west side of the settlement expansion area and several just outside of the area. Based on a preliminary assessment of these sites, it is anticipated that future development will have to consider a minimum separation distance and other mitigation measures to manage land use conflicts. Further analysis will be required prior to development to confirm the extent of impacted lands.	Gobles silty clay loam or clay loam occurs in the upland portion of the northwest and southern of Area 4. Other soil types includes a Kintyre sandy loam, fine sandy loam or loamy fine sand in the northeast area, and a Colwood silty clay loam or silty clay in the central portion of this Area. All soils are considered prime agricultural land with all soils considered Class 2 with fertility of excessive water being the limitation. Area 4 includes several potential existing active livestock operations within the settlement expansion area and one outside of the area. Based on a preliminary assessment of these sites, it is anticipated that future development will have to consider a minimum separation distance and other mitigation measures to manage land use conflicts. Further analysis will be required prior to development to confirm the extent of impacted lands.
9. MINERAL & PETROLEUM	*Does the settlement expansion area contain mineral or*	There are currently no entries in Mineral Deposit Inventory dataset, no entries in Abandoned Mines	There are currently no entries in Mineral Deposit Inventory dataset, no entries in Abandoned Mines	There are currently no entries in Mineral Deposit Inventory dataset, no entries in	There are currently no entries in Mineral Deposit Inventory dataset, no entries in

Study Area		Area 1	Area 2	Area 3	Area 4
RESOURCES	*petroleum resources?*	dataset, no entries in Petroleum Pools dataset and no entries in Petroleum Well dataset within Area 1.	dataset, no entries in Petroleum Pools dataset and no entries in Petroleum Well dataset within Area 2, however a single entry listed as an abandoned well is situated approx. 520m to the southwest.	Abandoned Mines dataset, no entries in Petroleum Pools dataset, and no entries in Petroleum Well dataset within Area 3, however a single entry listed as an abandoned well is situated approx. 550m to the west.	Abandoned Mines dataset, no entries in Petroleum Pools dataset and no entries in Petroleum Well dataset within Area 4.
10. CULTURAL HERITAGE & ARCHAEOLOGY	*Does the settlement expansion area contain significant cultural heritage landscapes?*	No significant cultural heritage landscapes have been identified in the settlement expansion areas. At the time of development, an archaeological study will be required to confirm any cultural heritage assets.	No significant cultural heritage landscapes have been identified in the settlement expansion areas. At the time of development, an archaeological study will be required to confirm any cultural heritage assets.	No significant cultural heritage landscapes have been identified in the settlement expansion areas. At the time of development, an archaeological study will be required to confirm any cultural heritage assets.	No significant cultural heritage landscapes have been identified in the settlement expansion areas. At the time of development, an archaeological study will be required to confirm any cultural heritage assets.
11. NATURAL HAZARDS	*Is the settlement expansion area subject to flooding, erosion or other natural hazards?*	All areas have flood or erosion hazards which have been mapped according to Schut (1992). At the time of development, a geotechnical analysis will be required to determine the stable top of slope and confirm conformity with the Provincial Policy Statement (2014). Other mitigation measures may be required in some situations.	All areas have flood or erosion hazards which have been mapped according to Schut (1992). At the time of development, a geotechnical analysis will be required to determine the stable top of slope and confirm conformity with the Provincial Policy Statement (2014). Other mitigation measures may be required in some situations.	All areas have flood or erosion hazards which have been mapped according to Schut (1992). At the time of development, a geotechnical analysis will be required to determine the stable top of slope and confirm conformity with the Provincial Policy Statement (2014). Other mitigation measures may be required in some situations.	All areas have flood or erosion hazards which have been mapped according to Schut (1992). At the time of development, a geotechnical analysis will be required to determine the stable top of slope and confirm conformity with the Provincial Policy Statement (2014). Other mitigation measures may be required in some situations.
12. HUMAN-MADE HAZARDS	*Does the settlement expansion area contain human made hazards such as environmental soils contamination?*	There are no known sources of environmental soils contamination on these lands. A Phase 1 ESA would be required to confirm environmental soils conditions.	Environmental soils contamination may be present in and around the former rail corridor lands. A Phase 1 ESA would be required to confirm environmental soils conditions.	There are no known sources of environmental soils contamination on these lands. A Phase 1 ESA would be required to confirm environmental soils conditions.	Environmental soils contamination may be present in and around the former rail corridor lands. A Phase 1 ESA would be required to confirm environmental soils conditions.
13. TRANSIT AND ACTIVE TRANSPORTATION	*Can the settlement expansion are be efficiently served by existing or future/planned transit service?*	Moderate opportunity to connect to transit network. Good opportunity for a multi-use trail using the abandoned rail corridor that borders the north boundary of the area. This could connect into St. Thomas just north of Downtown	Moderate opportunity to connect to transit network. Good opportunity to connect to active transportation network due to its proximity to the Trans Canada trail network. Good opportunity for a multiuse trail through Area 2 to connect into downtown St. Thomas using the former rail corridor.	Moderate opportunity to connect to transit network. Moderate opportunity to connect to active transportation network due to its proximity to the Elgin hiking trail west of Area 3 and the abandoned rail corridor north of Area 3.	Moderate opportunity to connect to transit network with Route 3 – Talbot running along Sunset Drive close to Area 4. Moderate opportunity to connect to active transportation network due to its proximity to the Elgin hiking trail south west of Area 4.
14. ROAD IMPROVEMENTS	*Can the settlement expansion area be efficiently served by municipal road network?*	Area 1 has access to Sunset Drive (identified as a Highway or Major County Road in the City's Official Plan), Wellington Road (Major Arterial Road) and Major Line (Major Arterial Road). The County/arterial roads could be widened/upgraded if necessary.	Area 2 has access to Fingal Line (identified as a Major Arterial Road in the City's Official Plan). Upgrading of this road is highly constrained by the bridge at Fingal and Sunset Drive.	Area 3 has access to Fingal Line (identified as a Major Arterial Road in the City's Official Plan). Upgrading of this road is highly constrained by the bridge at Fingal and Sunset Drive.	Area 4 has access off Bush Line (identified as a Local Road in the City's Official Plan). There is limited ability to upgrade or add capacity due to its current configuration.
15. WATER IMPROVEMENTS	*Can the settlement expansion area be efficiently serviced with municipal water services? Are there benefits to the extension of municipal water services for other properties?*	Close proximity to existing water distribution system with opportunities to connect to either/or City of St. Thomas or the secondary water supply through Elgin Middlesex systems, subject to available capacity. Other existing properties along Sunset Drive could also benefit from the extension of municipal water services.	Opportunities to connect to existing water distribution system with opportunities to connect to either/or City of St. Thomas or Elgin Middlesex systems, subject to available capacity.	Opportunities to connect to existing water distribution system with opportunities to connect to either/or City of St. Thomas or the Elgin Middlesex systems, subject to available capacity.	Furthest from potential connections to the existing City of St. Thomas water distribution system

Study Area		Area 1	Area 2	Area 3	Area 4
16. SANITARY SEWER SYSTEM	*Can the settlement expansion area be efficiently serviced with municipal sanitary sewage services? Are there benefits to the extension of municipal sanitary sewage services for other properties?*	Two pump stations would be required to allow sanitary servicing to cross Dodd's Creek and Kettle Creek (at Wellington Road and Sunset Drive, respectively). Potential upgrades would also be required to increase the capacity of the Sunset Pumping Station and forcemain. Downstream sanitary servicing could be sized to accommodate Area 2 and 3, should they be developed in the future.	Potential to service lands by gravity sanitary sewer along Fingal Line, in conjunction with Area 3. A pump station would be required to cross Kettle Creek, west of Sunset Drive. Potential upgrades may be required to increase the capacity of the Sunset Pumping Station and forcemain.	Potential to service lands by gravity sanitary sewer along Fingal Line, in conjunction with Area 2. A pump station would be required to cross Kettle Creek, west of Sunset Drive. Potential upgrades may be required to increase the capacity of the Sunset Pumping Station and forcemain.	A pumping station would be required to cross Kettle Creek to provide sanitary servicing.
17. EMERGENCY SERVICES	*Can emergency services be efficiently delivered to the settlement expansion area?*	Emergency services can be delivered to all areas. Level of efficiency will depend on access provided through existing and future arterial/collector roads and proximity to a fire station.	Emergency services can be delivered to all areas. Level of efficiency will depend on access provided through existing and future arterial/collector roads and proximity to a fire station.	Emergency services can be delivered to all areas. Level of efficiency will depend on access provided through existing and future arterial/collector roads and proximity to a fire station.	Emergency services can be delivered to all areas. Level of efficiency will depend on access provided through existing and future arterial/collector roads and proximity to a fire station.
18. AIR QUALITY AND CLIMATE CHANGE	*Does the selection of the settlement expansion area minimize the negative impacts of air quality, climate change or promote energy efficiency?*	Each of the settlement expansion areas can accommodate low impact development, energy efficient building designs and minimize impacts on air quality. At the time of development, the City could explore the feasibility of various air quality and climate change solutions for the preferred settlement expansion area.	Each of the settlement expansion areas can accommodate low impact development, energy efficient building designs and minimize impacts on air quality. At the time of development, the City could explore the feasibility of various air quality and climate change solutions for the preferred settlement expansion area.	Each of the settlement expansion areas can accommodate low impact development, energy efficient building designs and minimize impacts on air quality. At the time of development, the City could explore the feasibility of various air quality and climate change solutions for the preferred settlement expansion area.	Each of the settlement expansion areas can accommodate low impact development, energy efficient building designs and minimize impacts on air quality. At the time of development, the City could explore the feasibility of various air quality and climate change solutions for the preferred settlement expansion area.
19. OVERALL CAPITAL COSTS	*What are the order of magnitude costs associated with servicing the settlement expansion area?*	Area 2 and 3 have the lowest external sanitary and water servicing costs. Comparatively, Area 1 would require additional costs including another 300 m of sanitary sewer, an additional sanitary pumping station to cross the creek and up to 2,000 m additional length of watermain extensions to the City and/or St. Thomas Secondary distribution systems. The proposed watermain extensions would ultimately provide a looped distribution system with supply redundancy, connecting to the City's and/or Township of Southwold's existing distribution systems. Based on these additional servicing costs, Area 1 would be the most expensive to provide external municipal servicing to. From a transportation network perspective, Area 1 is unlikely to require any additional transportation infrastructure and would therefore be the least costly. Localized improvements may be necessary to facilitate traffic access to Area 1.	Area 2 and 3 have the lowest capital costs to provide external sanitary and water servicing to the area, including a 1,250 m sanitary sewer extension, a new pumping station to cross Kettle Creek, upgrades to the Sunset Pumping Station and forcemain (975 m), and a 1,965 m watermain extension. Servicing for Area 2 could be sized to service Area 3 as well. From a transportation network perspective, Area 2 (along with Area 4) would be the most expensive (or impossible) to upgrade/widen due to the location of the bridge, piers and river at Fingal Line and Sunset Drive. Localized improvements may be necessary to facilitate traffic access to Area 2. In addition, downstream capacity on Sunset Drive and Wellington Road will need to be assessed.	Area 2 and 3 have the lowest capital costs to provide external sanitary and water servicing to the area, including a 1,250 m sanitary sewer extension, a new pumping station to cross Kettle Creek, upgrades to the Sunset Pumping Station and forcemain (975 m), and a 1,965 m watermain extension. Servicing for Area 3 could be sized to service Area 2 as well. From a transportation network perspective, Area 3 is unlikely to require any additional transportation infrastructure if developed on its own. However, if additional capacity was required in the long term, this would be the most expensive (or impossible) to upgrade/widen due to the location of the bridge, piers and river at Fingal Line and Sunset Drive. Localized improvements may be necessary to facilitate traffic access to Area 3. In addition, downstream capacity on Sunset Drive and Wellington Road will need to be assessed.	Area 2 and 3 have the lowest external sanitary and water servicing costs. Comparatively, Area 4 would require additional costs including a minimum additional 900 m of watermain extension. Sanitary servicing costs would be similar to Areas 2 and 3 in terms of the 1,250 m sanitary sewer extension and a new pumping station to cross Kettle Creek. Based on these servicing needs, Area 4 would be less expensive to service than Area 1. From a transportation network perspective, Area 4 (along with Area 2) would be the most expensive, due to the grade and curvilinear nature of Bush Line. Localized improvements may be necessary to facilitate traffic access to Area 4. In addition, downstream capacity on Sunset Drive and Wellington Road will need to be assessed.

Study Area		Area 1	Area 2	Area 3	Area 4
20. CROSS JURISDICTIONAL	*Are there any known cross jurisdictional issues or opportunities that may impact the viability of the land to be developed?*	May be cross jurisdictional/boundary issues associated with roads and servicing.	May be cross jurisdictional/boundary issues associated with servicing.	May be cross jurisdictional/boundary issues associated with servicing.	Not likely to be cross jurisdictional/boundary issues.

Appendix B

Transportation Technical Report

DILLON CONSULTING

DILLON CONSULTING

CITY OF ST. THOMAS

Positioned for Growth

Transportation Technical Report

November 2019 – 18-9022

Table of Contents

1.0 Introduction 1

1.1 Background 1
1.2 Potential Settlement Expansion Areas 2
1.2.1 Area 1 2
1.2.2 Area 2 3
1.2.3 Area 3 4
1.2.4 Area 4 5
1.2.5 Preferred Settlement Expansion Area 7
1.3 Scope of Work 7

2.0 Existing Conditions 8

2.1 Site Context 8
2.2 Road Network Characteristics 8
2.3 Existing Traffic Volumes 10
2.4 Existing Intersection Operations 12

3.0 Future Background Conditions 15

3.1 Future Background Traffic Growth 15
3.2 Future Background Developments 15
3.2.1 Talbotville Subdivision 15
3.2.2 McBain Farm Subdivision 16
3.3 Future Background Traffic Volumes 16
3.4 Future Background Intersection Operations 17

4.0 Site Traffic 20

4.1 Proposed Development 20
4.2 Trip Generation 20
4.3 Trip Distribution and Assignment 21
4.3.1 Trip Distribution 21
4.3.2 Trip Assignment 23

5.0 Total Future Conditions 26

5.1 Total Future Traffic Volumes 26
5.2 Total Future Intersection Operations 27

5.2.1 Total Future Operations at Existing Intersections 27
5.2.2 Total Future Operations at Proposed Intersections 29

6.0 Potential Improvements 32
6.1 Intersection Control at Existing Intersections 32
6.1.1 Sunset Drive and Major Line 32
6.1.2 Major Line and Ford Road 33
6.1.3 Wellington Road [CR 25] and Ford Road 34
6.1.4 Wellington Road [CR 25] and St. George Street [CR 26] 34
6.1.5 Sunset Drive, Wellington Road and Talbot Street 35
6.2 Intersection Control at Proposed Area 1 Intersections 35
6.2.1 Major Line and Proposed Area 1 Access 35
6.2.2 Sunset Drive and Proposed Area 1 Access 36
6.2.3 Wellington Road and Proposed Area 1 Access 36
6.3 Turning Lanes 37
6.3.1 Sunset Drive and Major Line 38
6.3.2 Major Line and Ford Road 39
6.3.3 Sunset Drive, Wellington Road and Talbot Street 40

7.0 Alternative Transportation Modes 41
7.1 Transit Network Expansion 41
7.2 Active Transportation Opportunities 46

8.0 Cost Estimates 48

9.0 Summary 51
9.1 Area 1 Background 51
9.2 Potential Improvements 51

Figures

Figure 1: Potential Settlement Expansion Areas 1
Figure 2: Location of Area 1 2
Figure 3: Location of Area 2 3
Figure 4: Location of Area 3 4
Figure 5: Location of Area 4 6
Figure 6: Preferred Location (Area 1) 8
Figure 7: Existing Lane Configurations & Traffic Control 10

Figure 8: Existing (2019) Traffic Volumes 12
Figure 9: Future Background (2039) Traffic Volumes 17
Figure 10: Site-Generated Traffic Volumes 25
Figure 11: Total Future (2039) Traffic Volumes 26
Figure 12: Southeast-Bound Left Turn Lane Warrant on Sunset Drive at Major Line 38
Figure 13: Northwest Bound Left Turn Lane Warrant on Ford Road at Major Line 40
Figure 14: St. Thomas Transit Network 42
Figure 15: Route 3 - Talbot Route Map 43
Figure 16: Route 5a – Express Commercial Route 44
Figure 17: Potential Transit Routing between Downtown St. Thomas and Area 1 45
Figure 18: Alternate Transit Routing between Downtown St. Thomas and Area 1 via Lyndhurst 46
Figure 19: Active Transportation Corridors Surrounding Area 1 47

Tables

Table 1: Turning Movement Count Data Collection 11
Table 2: Existing (2019) Intersection Operations 13
Table 3: Future Background Intersection Operations (2039) 18
Table 4: Area 1 - Trip Generation 21
Table 5: Estimated Site Trip Distribution 22
Table 6: Vehicle Trips Distributed 22
Table 7: Vehicle Trips to the South – Trip Assignment 24
Table 8: Number of Vehicle Trips at Proposed Accesses 24
Table 9: Percentage Increase in Traffic at Study Area Intersections 27
Table 10: Total Future Intersection Operations at Existing Intersections (2039) 27
Table 11: Total Future Intersection Operations at Proposed Intersections (2039) 30
Table 12: Roundabout Operations - Sunset Drive and Major Line 33
Table 13: Roundabout Operations - Multi-Lane Approach on All Legs 35
Table 14: Estimated 2039 Costs for Improvements at Existing Intersections 48
Table 15: Estimated 2039 Costs for Improvements along Existing Corridors 48
Table 16: Estimated 2039 Costs at Proposed Intersections 49

Appendices

A Area 1 Site – Development Area

B Turning Movement Count Data

C LOS Definitions

D Synchro Analysis Worksheets

E Sidra Analysis Worksheets

F Traffic Signal Warrants

G Hourly Variation in Trip Generation

1.0 Introduction

1.1 Background

Dillon Consulting Limited ("Dillon") has been retained by the City of St. Thomas to prepare a Transportation Technical Report which documents a transportation assessment for the Positioned for Growth Study.

It was determined that an additional 76 gross hectares of residential land was deemed necessary to accommodate future population growth in St. Thomas. Four expansion areas located along the west limits of the City of St. Thomas were identified and strategically evaluated as potential areas to support this forecasted growth.

Figure 1 shows the geographic area for the four settlement expansion areas that were under consideration.

Figure 1: Potential Settlement Expansion Areas



1.2 Potential Settlement Expansion Areas

1.2.1 Area 1

Area 1 is located within the northwest section of the City of St. Thomas. Specifically, it is located northeast of Sunset Drive, west of Wellington Road and south of the CN Paynes Subdivision Rail line. Area 1 has 63 hectares of available land that could be developed.

Figure 2 shows the limits of the potential development areas within Area 1.

Figure 2: Location of Area 1



The transportation strategic assessment results for Area 1 are as follows:

- Transit - There is a moderate opportunity to connect to the existing transit network within St. Thomas.
- Active Transportation - There is a good opportunity for a multi-use trail along the southern boundary of the area. This trail could connect into St. Thomas via Sunset Drive, Wellington Road and Talbot Street. On-street bike lanes could also be introduced on Wellington road, Sunset Drive, and Major Line.

- Auto - This area has access to multiple roads, including Sunset Drive, Wellington Road, and Major Line. Opportunities to widen / upgrade these roads could occur if necessary.

1.2.2 Area **2**

Area 2 is located within the western section of the City of St. Thomas. Specifically it is located north of Fingal Line, west of Sunset Drive, and extends to the west and north limits of the City of St. Thomas. Area 2 has 101 hectares of available land that could be developed.

Figure 3 shows the limits of the potential development areas within Area 2.

Figure 3: Location of Area 2



The transportation strategic assessment results for Area 2 are as follows:

- Transit - There is a moderate opportunity to connect to the transit network.
- Active Transportation - There is also a good opportunity to connect to the Great Trail network. There is also a good opportunity for a multi-use trail through this area that could connect into downtown St. Thomas using the former rail corridor.

- Auto - This area has exclusive access to Fingal Line. A constraint exists on Fingal Line west of Sunset Drive due to the bridge over the Kettle Creek as well as the abandoned railway structure crossing above Fingal Line just west of Sunset Drive.

1.2.3 Area **3**

Area 3 is located within the western section of the City of St. Thomas. Specifically it is located south of Fingal Line, west of Sunset Drive, and extends to the west limits of the City of St. Thomas. Area 3 has 39 hectares of available land that could be developed.

Figure 4 shows the limits of the potential development areas within Area 3.

Figure 4: Location of Area 3



The transportation strategic assessment results for Area 3 are as follows:

- Transit - There is a moderate opportunity to connect to the transit network.
- Active Transportation - There is a good opportunity to connect to the Elgin hiking trail to the west. There is also a good opportunity for a multi-use trail through this area that would connect to the abandoned rail corridor found to the north. This trail could connect into downtown St. Thomas using the former rail corridor.
- Auto - This area has exclusive access to Fingal Line. Similar to Area 2, a constraint exists on Fingal Line west of Sunset Drive due to the bridge over the Kettle Creek as well as the abandoned railway structure crossing over top of Fingal Line just west of Sunset Drive.

1.2.4 Area 4

Area 4 is located within the western section of the City of St. Thomas. Specifically, it is located north and south of Bush Line and well west of Sunset Drive. Area 4 has 88 hectares of available land that could be developed.

Figure 5 shows the limits of the potential development areas within Area 4.

Figure 5: Location of Area 4



The transportation strategic assessment results for Area 4 are as follows:

- Transit - There is a moderate opportunity to connect to the transit network with Route 3 – Talbot operating on Sunset Drive near Area 4.
- Active Transportation - There is a good opportunity to connect to the Elgin hiking trail found south west of Area 4.
- Auto - This area has exclusive access to Bush Line (identified as a local road). Due to the classification, road allowance width, and alignment of Bush Line, multiple constraints are present due to limited ability to upgrade Bush Line and add capacity.

1.2.5 Preferred Settlement Expansion Area

After considering the evaluation criteria from multiple disciplines, including natural heritage, proximity to existing built-up areas, agricultural impacts, natural hazards, housing, and road and water improvements, Area 1 was selected as the preferred area.

1.3 Scope of Work

This report summarizes the operational level-of-service analysis at intersections being impacted by the proposed development of Area 1, and identifies and recommends appropriate infrastructure modifications to accommodate the increase in traffic volume. The analysis also includes an assessment of the existing transit network and identifies opportunities to expand the network to service Area 1. Active transportation opportunities were assessed and promoted.

The analyses focused on five existing intersections surrounding the Area 1 development, including:

- Major Line and Sunset Drive;
- Ford Road and Major Line;
- Ford Road and Wellington Road [CR 25][1];
- St. George Street [CR 26] and Wellington Road [CR 25][1]; and
- Sunset Drive, Wellington Road and Talbot Street.

This study also reviewed intersection operations at three potential intersections connecting directly to Area 1. These intersections are:

- Major Line and the site access;
- Sunset Drive and the site access; and
- Wellington Road and the site access.

Since this study consists of a high-level review to support future developments within Area 1, the following study horizon years were assessed:

- 2019 (existing); and
- 2039 (full build out).

The full build out analysis for the 2039 horizon year considered future background and total future conditions. Future background conditions are based on traffic volumes based on base traffic growth and other known developments near to the study area. Total future conditions are based on the future background traffic volumes plus the forecast traffic volumes added by the Area 1 development.

[1] Intersection is not within the jurisdiction of St Thomas therefore no infrastructure modifications were identified or recommended.

2.0 Existing Conditions

2.1 Site Context

Area 1, the site, is located in the northwest quadrant of the City of St. Thomas. The area is bounded by the CN Paynes Subdivision railway to the north; Sunset Drive and a few commercial properties to the west and southwest; forested land to the south; Wellington Road to the east; and residential properties to the northeast. Major Line traverses through Area 1, with Sunset Drive found to the west and Ford Road found to the east. The land is primarily vacant.

Figure 6 illustrates the location of Area 1 within the City of St. Thomas.

Figure 6: Preferred Location (Area 1)



2.2 Road Network Characteristics

The following describes the existing road network in the immediate vicinity of Area 1:

Sunset Drive is under the jurisdiction of the City of St. Thomas and is a predominantly north-south road classified as a "highway or major county road" within the City of St. Thomas' Official Plan. Within the

study area, the cross-section varies between two, three and four lanes. Sunset Drive outside of the St. Thomas City Limits is also known as Elgin County Road 4. Prior to the provincial highway downloading in the late 1990s, Highway 4 also used to extend along Sunset Drive south from Talbotville through to Port Stanley. Within the study area, no sidewalks are found. At the north limits of the study area, Sunset Drive intersects with Major Line at a three-legged unsignalized intersection with no turning lanes present. At the south limits, Sunset Drive meets both Wellington Road and Talbot Street at a multi-lane roundabout, which was constructed in 2017. Within the study area, it has a posted speed limit of 60 km/h, increasing to 80 km/h north of Major Line.

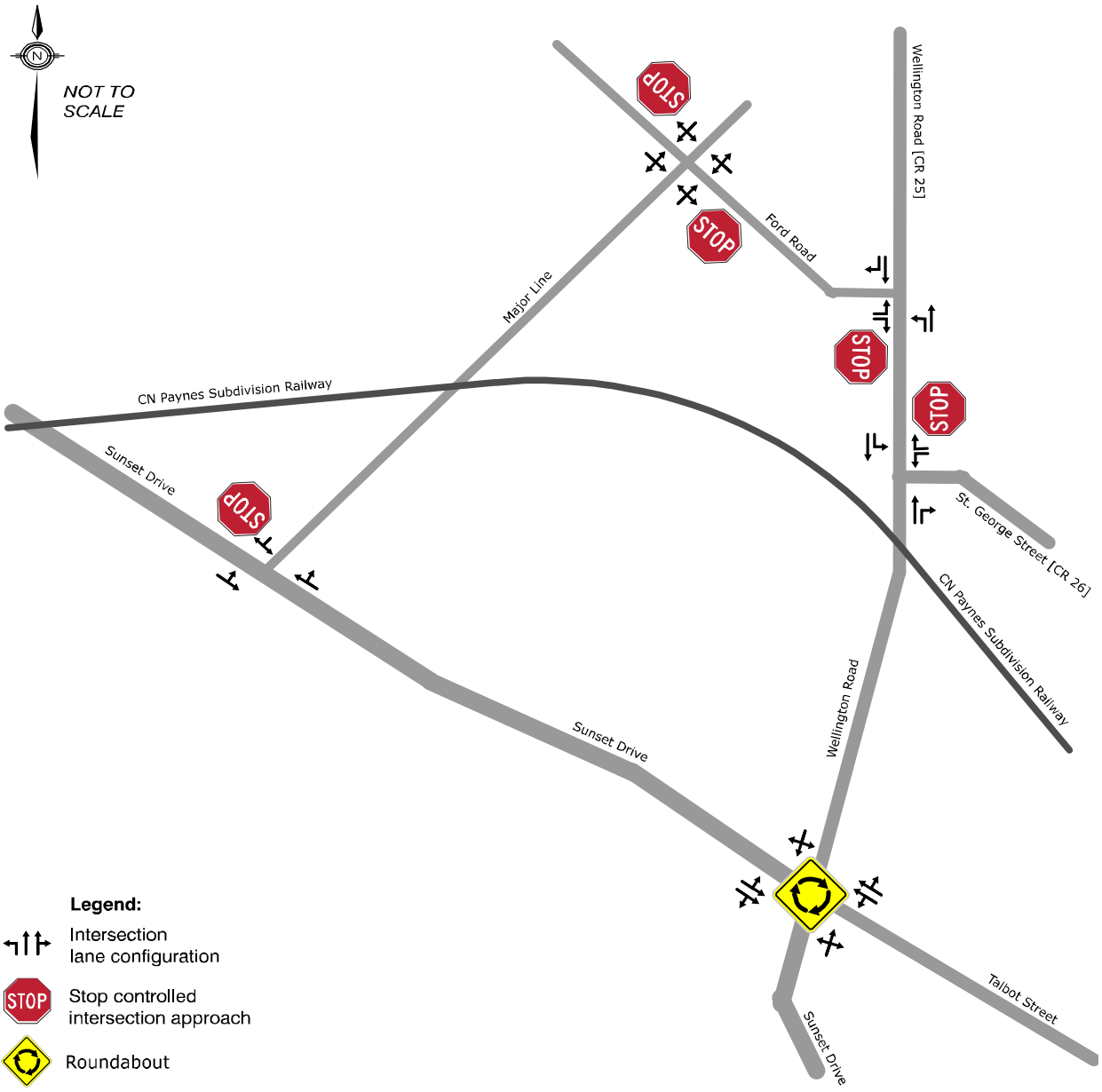
Wellington Road is a predominantly north-south two-lane major arterial road with the northern portion of Wellington Road being under the jurisdiction of Elgin County and the southern portion of the road being under the jurisdiction of the City of St. Thomas. North of the St. Thomas City Limits, it is also known as Elgin County Road 25. Wellington Road extends north from the multi-lane roundabout with Sunset Drive through the study area, crossing over Highway 3 and extending into the City of London. Exclusive right and left turn lanes are present at the two study area intersections. Within the study area, sidewalks are only found on the east side of Wellington Road north of St. George Street (Elgin County Road 26). Wellington Road meets both Major Line and St. George Street at three-legged side-street stop control intersections. Within the City of St. Thomas, it has a posted speed limit of 60 km/h, but reduces to 50 km/h upon entering Elgin County.

Major Line is a roadway extending in a southwest-northeast manner between Sunset Drive and Ford Road. Within the study area, the western portion is under the jurisdiction of the City of St. Thomas, while the eastern portion is under the jurisdiction of the Township of Southwold. It has a posted speed limit of 60 km/h and no curbs or sidewalks are present within the study area.

Ford Road is a roadway extending in a northwest-southeast direction between Wellington Road and Highway 3. Within the study area, the entirety of Ford Road is under the jurisdiction of the Township of Southwold. Ford Road extends southeast from Highway 3 at the northerly limits, terminating at Wellington Road (Elgin County Road 25). A short section of rollover curb and sidewalk is found on the northeast side of Ford Road when approaching Wellington Road. The posted speed limit is 60 km/h.

Figure 7 illustrates the existing traffic control and lane configurations at the study area intersections.

Figure 7: Existing Lane Configurations & Traffic Control



2.3 Existing Traffic Volumes

Turning movement count (TMC) traffic data was collected at the following locations:

- Major Line and Sunset Drive;
- Ford Road and Major Line;
- Ford Road and Wellington Road [CR 25];
- St. George Street [CR 26] and Wellington Road [CR 25]; and
- Sunset Drive, Wellington Road and Talbot Street.

The data collected included the following periods:

- Weekday mornings between 7:00 AM and 10:00 AM; and
- Weekday afternoons between 3:00 PM and 6:00 PM.

Table 1 identifies the dates that the turning movement count data was collected for this study.

Table 1: Turning Movement Count Data Collection

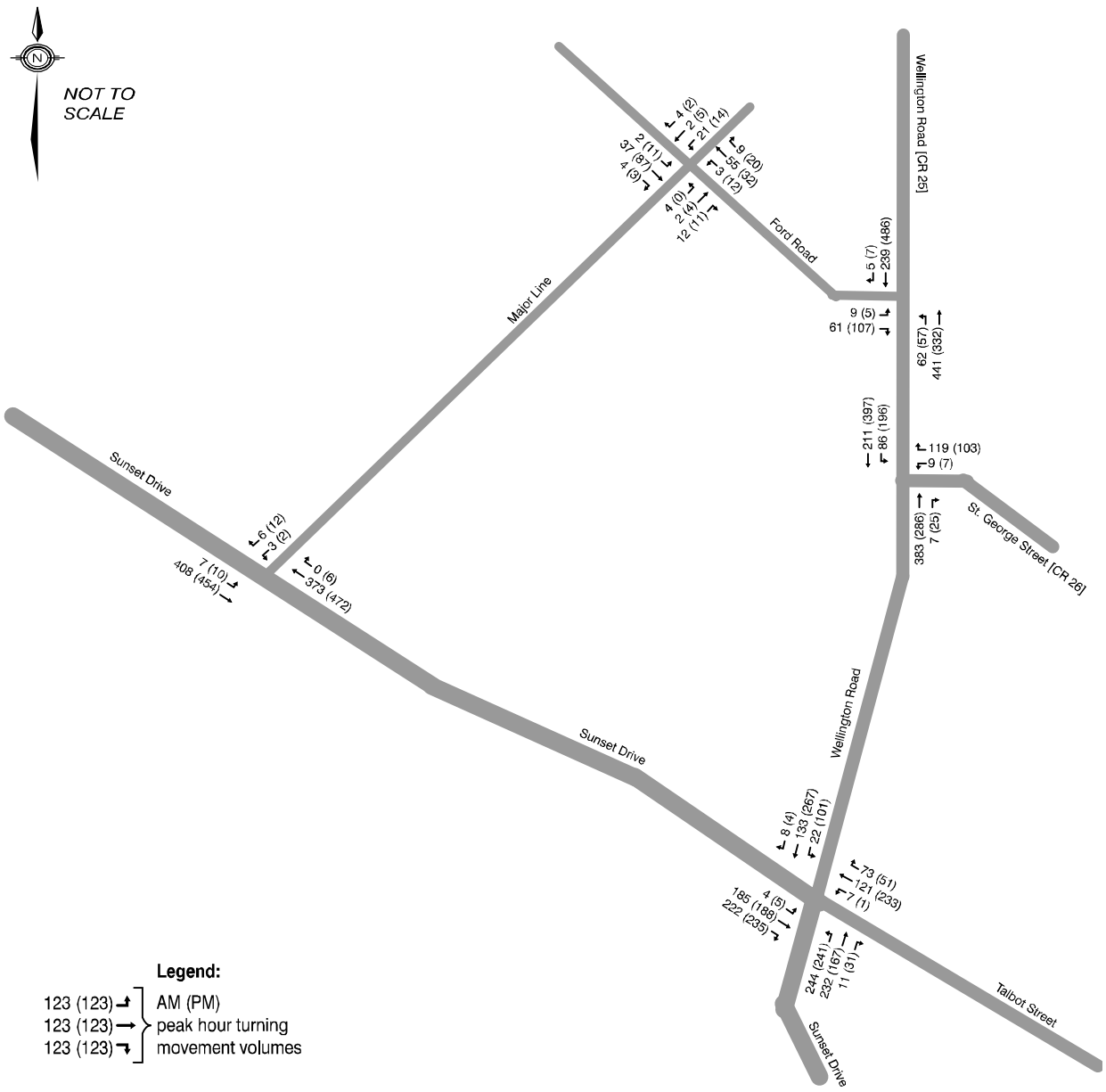
Intersection	Survey Date
Major Line and Sunset Drive	Tuesday, September 10, 2019
Ford Road and Major Line	Thursday, September 5, 2019
Ford Road and Wellington Road [CR 25]	Thursday, September 5, 2019
Wellington Road [CR 25] and St. George Street [CR 26]	Thursday, September 5, 2019
Sunset Drive, Wellington Road and Talbot Street	Wednesday, November 15, 2017

Since the Sunset Drive, Wellington Road and Talbot Street intersection was counted in 2017, traffic volumes at this intersection were inflated by an annual 2.0% growth factor (as outlined in the 2019 Edition of the City of St. Thomas *Design Guidelines Manual)* to reflect 2019 volumes.

In addition, to account for differences in the timing of the collected traffic volume data, slight adjustments were made.

Figure 8 illustrates the existing 2019 traffic volumes during the weekday AM and PM peak hours. The raw traffic volume data can be seen in *Appendix B*.

Figure 8: Existing (2019) Traffic Volumes



2.4 Existing Intersection Operations

Existing peak hour operations at the four unsignalized intersections were determined based on the methodology outlined in the *Highway Capacity Manual* (HCM), and facilitated using the Synchro analysis software (version 10). Synchro analysis worksheets are provided in *Appendix D*. Peak hour operations at the roundabout were facilitated using the Sidra for Roundabouts analysis software. The Sidra analysis worksheets are provided in *Appendix E*. The intersection analyses are based on the existing lane configurations and traffic control.

For all five existing intersections within the study area, the overall average vehicle delays are noted, with the overall level of service shown at the roundabout intersection. The analysis took into consideration the prescribed Saturation Flow Rates as noted within the 2019 Edition of the City of St. Thomas *Design Guidelines Manual*. In addition, for each individual movement, the volume-to-capacity ratio, level of service[2], average delay and 95th percentile queue length were noted. The results were reviewed to identify any critical movements, defined within the 2019 Edition of St. Thomas's *Design Guidelines Manual* as:

- Any through lane / movement with a v/c ratio of 0.85 or higher;
- Any left or right turning lane / movement with a v/c ratio of 0.95 or higher;
- Any existing lane / movement operating at LOS F;
- Any future lane / movement operating at LOS E or F; and
- Any turning movement with a 95th percentile queue exceeding the available storage.

Table 2 below summarizes the existing study area intersection operations.

Table 2: Existing (2019) Intersection Operations

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Sunset Drive & Major Line (Side Street STOP controlled) - *Synchro*								
Westbound approach	0.02	B	13.2	0.5	0.03	B	12.4	0.7
Northbound approach	0.25	A	0.0	0.0	0.30	A	0.0	0.0
Southbound approach	0.01	B	0.2	0.2	0.01	A	0.3	0.3
Overall	—	—	0.3	—	—	—	0.3	—
Major Line & Ford Road (Side Street STOP controlled) - *Synchro*								
Southeast approach	0.00	A	0.3	0.0	0.01	A	0.8	0.2
Northwest approach	0.00	A	0.4	0.1	0.01	A	1.5	0.2
Northeast approach	0.02	A	8.9	0.6	0.02	A	9.2	0.4
Southwest approach	0.04	A	9.7	1.0	0.03	A	9.9	0.7
Overall	—	—	2.9	—	—	—	2.6	—
Wellington Road [CR 25] & Ford Road (Side Street STOP controlled) - *Synchro*								
Eastbound left	0.04	C	18.8	0.9	0.02	C	19.2	0.5
Eastbound right	0.09	B	10.4	2.5	0.20	B	13.0	6.0
Northbound left	0.06	A	8.0	1.4	0.06	A	8.7	1.5
Northbound through	0.30	A	0.0	0.0	0.21	A	0.0	0.0
Southbound through	0.16	A	0.0	0.0	0.30	A	0.0	0.0
Southbound right	0.00	A	0.0	0.0	0.00	A	0.0	0.0
Overall	—	—	1.6	—	—	—	2.0	—

[2] Level of Service (LOS), applied to an intersection, is a measure qualifying the amount of delay experienced by motorists, expressed either for specific turning movements or for the intersection as a whole. A more detailed explanation of LOS is provided in *Appendix C*.

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Wellington Road [CR 25] & St. George Street [CR 26] (Side Street STOP controlled) - Synchro								
Westbound left	0.04	C	18.3	0.9	0.04	D	26.6	1.0
Westbound right	0.22	B	12.5	6.7	0.15	B	10.7	4.2
Northbound through	0.26	A	0.0	0.0	0.18	A	0.0	0.0
Northbound right	0.00	A	0.0	0.0	0.02	A	0.0	0.0
Southbound left	0.09	A	8.6	2.4	0.17	A	8.5	4.9
Southbound through	0.14	A	0.0	0.0	0.25	A	0.0	0.0
Overall	—	—	2.9	—	—	—	2.9	—
Wellington Road, Sunset Drive, Talbot Street (Roundabout) – Sidra								
Northbound approach	0.45	A	7.7	20.0	0.45	A	8.6	20.1
Westbound approach	0.11	A	5.8	4.1	0.15	A	5.3	5.7
Southbound approach	0.18	A	6.0	5.8	0.42	A	7.5	15.8
Eastbound approach	0.18	A	4.3	6.5	0.22	A	5.2	8.6
Overall	—	A	6.1	—	—	A	7.8	—

Under existing conditions, all intersections perform acceptably during both the weekday AM and PM peak hours. In the AM peak hour, all movements operate at LOS C or better, while in the PM peak hour, most movements operate at LOS C or better, with the exception of the westbound left turn movement at the St. George Street (Elgin County Road 26) and Wellington Road (Elgin County Road 25) intersection, which operates at LOS D. This movement also has the highest delay (26.6 seconds) of any movement in the study area, and is found during the PM peak hour. The highest v/c ratio is found on the northbound approach of the Wellington Road, Sunset Drive and Talbot Street intersection (0.45 in both the AM and PM peak hours). This movement also has the longest queue, measured at 20.1 metres in the PM peak hour. All turning lanes have sufficient storage based on the calculated 95th percentile queue lengths.

3.0 Future Background Conditions

3.1 Future Background Traffic Growth

Future background traffic volumes reflect the volume of traffic that is anticipated to be on the road network up to and during the 2039 horizon year without the subject development in place. Typically this is comprised of two components:

- The application of a growth rate to reflect general background traffic growth on the road network; and
- The application of site-specific traffic volumes for any background developments in the immediate vicinity of the site.

It was determined that there are two background subdivision developments that will impact the study area by the 2039 horizon year for the purposes of this study.

In addition, as outlined within the 2019 Edition of the City of St. Thomas *Design Guidelines Manual*, an annual 2.0% background growth rate has been applied to all existing traffic volumes within the study area.

3.2 Future Background Developments

Apart from the general growth rate, two other subdivision developments outside of the City of St. Thomas limits were identified close to the study area. These include:

- Talbotville subdivision, which includes 321 single-detached units, 44 townhouses and 25,000 sq. ft. of commercial space; and
- McBain Farm subdivision, which includes 179 single-detached units.

Both subdivisions are anticipated to be built-out by the 2039 horizon year.

3.2.1 Talbotville Subdivision

This subdivision is found southwest of Talbotville in the Township of Southwold. The development is west of Sunset Drive (Elgin County Road 4) and south of Talbot Line (Elgin County Road 3). The development proposes 321 single-detached residential units, 44 townhouses and 25,000 sq. ft. of commercial space. Based on the July 2018 *Transportation Impact Study* by Paradigm Transportation Solutions Limited, this subdivision is forecast to generate 430 and 485 peak hour trips during the AM and PM peak hours, respectively.

While this development did not look at the same study intersections as this report, a number of site trips were distributed along Sunset Drive to the south into the study area. The trips generated by this subdivision were assigned through the study area intersections.

3.2.2 McBain Farm Subdivision

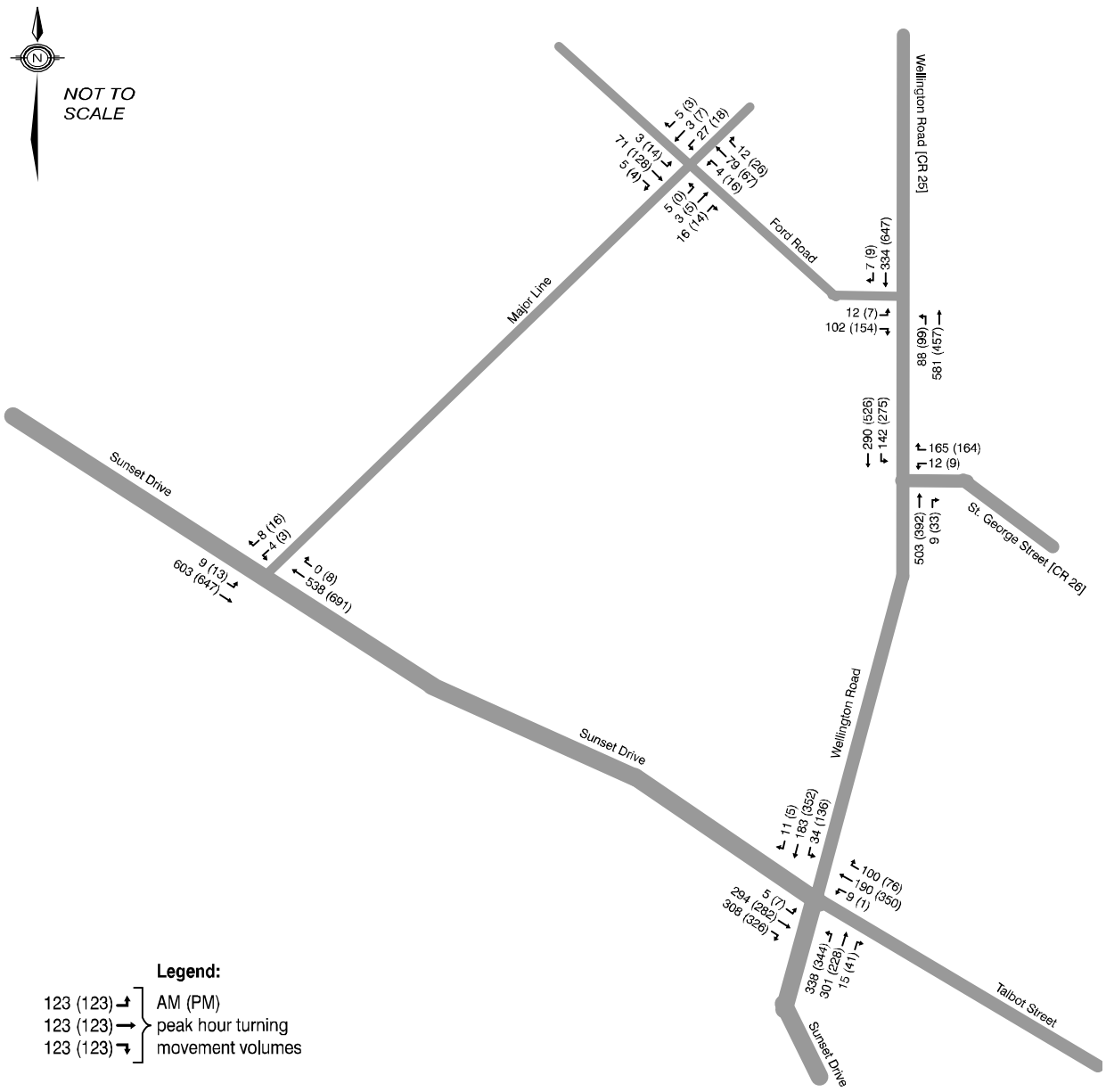
This subdivision is found on the southwest corner of the Highway 3 and Wellington Road (Elgin County Road 25) intersection within the Township of Southwold. This development proposes 179 single-detached residential units. Based on the October 2017 *Traffic Impact Assessment* completed by F.R. Berry & Associates, this subdivision is forecast to generate 135 and 177 vehicle peak hour trips during the AM and PM peak hours, respectively.

This development did consider the intersection of Wellington Road (Elgin County Road 25) and Ford Road in its analysis. The trips generated by this subdivision were assigned through the remaining study area intersections.

3.3 Future Background Traffic Volumes

The future background traffic volumes for the 2039 horizon years are illustrated in *Figure 9*.

Figure 9: Future Background (2039) Traffic Volumes



3.4 Future Background Intersection Operations

Future background intersection operations were assessed using the same methodology as the existing (2019) conditions analyses.

Table 3 summarizes the intersection operations at the study area intersections under future background traffic volumes for the 2039 horizon year.

Table 3: Future Background Intersection Operations (2039)

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Sunset Drive & Major Line (Side Street STOP controlled) - *Synchro*								
Westbound approach	0.05	C	19.3	1.3	0.06	C	16.6	1.5
Northbound approach	0.36	A	0.0	0.0	0.43	A	0.0	0.0
Southbound approach	0.01	A	0.3	0.2	0.02	A	0.4	0.4
Overall	—	—	0.3	—	—	—	0.4	—
Major Line & Ford Road (Side Street STOP controlled) - *Synchro*								
Southeast approach	0.00	A	0.3	0.1	0.01	A	0.8	0.2
Northwest approach	0.00	A	0.3	0.1	0.01	A	1.2	0.3
Northeast approach	0.04	A	9.4	0.9	0.02	A	9.6	0.6
Southwest approach	0.06	B	10.5	1.6	0.04	B	10.8	2.1
Overall	—	—	2.8	—	—	—	2.4	—
Wellington Road [CR 25] & Ford Road (Side Street STOP controlled) - *Synchro*								
Eastbound left	0.08	D	28.9	2.2	0.05	D	31.8	1.2
Eastbound right	0.18	B	11.9	5.3	0.36	C	17.5	13.2
Northbound left	0.09	A	8.4	2.3	0.12	A	9.5	3.2
Northbound through	0.39	A	0.0	0.0	0.29	A	0.0	0.0
Southbound through	0.23	A	0.0	0.0	0.40	A	0.0	0.0
Southbound right	0.00	A	0.0	0.0	0.01	A	0.0	0.0
Overall	—	—	2.0	—	—	—	2.8	—
Wellington Road [CR 25] & St. George Street [CR 26] (Side Street STOP controlled) - *Synchro*								
Westbound left	0.09	D	30.2	2.3	0.12	F	53.0	3.1
Westbound right	0.37	C	16.0	13.4	0.27	B	12.8	8.9
Northbound through	0.34	A	0.0	0.0	0.25	A	0.0	0.0
Northbound right	0.01	A	0.0	0.0	0.02	A	0.0	0.0
Southbound left	0.17	A	9.5	4.8	0.26	A	9.4	8.4
Southbound through	0.19	A	0.0	0.0	0.33	A	0.0	0.0
Overall	—	—	3.9	—	—	—	3.7	—
Wellington Road, Sunset Drive, Talbot Street (Roundabout) – *Sidra*								
Northbound approach	0.67	B	10.3	45.1	0.70	B	12.1	50.3
Westbound approach	0.20	A	7.0	9.3	0.27	A	6.5	12.8
Southbound approach	0.28	A	6.9	10.4	0.65	B	11.1	36.3
Eastbound approach	0.27	A	4.7	11.1	0.35	A	6.1	16.5
Overall	—	A	7.4	—	—	A	9.0	—

With the added background traffic, and comparing to the existing (2019) operations, a number of turning movement operations are forecast to change. This includes the eastbound left turn movement at the Ford Road and Wellington Road intersection, which is forecast to be operating at LOS D during both the AM and PM peak hours. The westbound left turn movement at the St. George Street [CR 26] and Wellington Road [CR 25] intersection is expected to operate at LOS D in the AM peak hour and LOS F

in the PM peak hour. However, this movement is expected to operate well under capacity (v/c ratio of 0.09 in the AM peak hour and 0.12 in the PM peak hour).

In addition, the northbound approach at the Wellington Road, Sunset Drive and Talbot Street roundabout is forecast to see the 95th percentile queues lengthen to 45 metres during the AM peak hour and 50 metres during the PM peak hour, while the associated v/c ratios for these movements are also anticipated to increase to 0.67 during the AM peak hour and 0.70 during the PM peak hour. Similar to the existing conditions analyses, all turning lanes are forecast to have sufficient storage based on the calculated 95th percentile queue lengths.

4.0 Site Traffic

4.1 Proposed Development

The Area 1 residential development area is located west of Wellington Road and east of Sunset Drive, and extends north across Major Line up to the north limits of the City of St. Thomas. The total area for potential development is 63 hectares (not including natural heritage), with 15 hectares found to the north of Major Line and the remaining 48 hectares located to the south of Major Line.

Based on the analysis completed within the *Watson Population and Housing Forecast*, 22 residential units could be assumed per hectare. This would result in 1,387 residential units being potentially developed within Area 1. For the analysis purposes, the entirety of Area 1 is envisioned to be built-out by the 2039 horizon year.

The analyses assumed that there will be access to/from Area 1 via Sunset Drive, Wellington Road and Major Line. The details of all three access points are provided below:

- A proposed full movement access road is assumed to connect to Sunset Drive, which would create a new three-legged or "T" intersection. This access is assumed to be approximately 525 metres southeast of the Major Line and Sunset Drive intersection;
- A proposed full movement access road is assumed to connect to Major Line, which would create a new four-legged intersection with connections to both the north and south within Area 1. This access is assumed to be approximately 450 metres northeast of the Major Line and Sunset Drive intersection; and
- A proposed full movement access road is assumed to connect to Wellington Road, which would create a new three-legged or "T" intersection. This access is assumed to be approximately 750 metres north of the Sunset Drive, Talbot Street and Wellington Road intersection and approximately 525 south of the Wellington Road (Elgin County Road 25) and St. George Street (Elgin County Road 26) intersection.

4.2 Trip Generation

The number of trips that may be generated by the proposed development within Area 1 was estimated using the trip generation rates contained within the *Trip Generation Manual* (10th edition) published by the *Institute of Transportation Engineers* (ITE). Based on information provided within the *Watson Population and Housing Forecast*, two residential land uses were selected.

The Housing Forecast assumed there would be a deficit of 1,048 residential units between 2018 and 2038 within St. Thomas. Out of these 1,048 residential units, 141 (13%) were anticipated to be medium-density housing, while the remaining 907 (87%) of units were anticipated to be low-density housing.

A total of 1,387 residential units can be potentially developed within Area 1 based on the available land area (63 hectares). Applying the above-noted density percentages would result in 1,207 low-density residential units and 180 medium-density residential units.

Based on these two residential land uses and densities, two residential ITE land use codes were selected to estimate future trips for Area 1. The proposed trip generation has been summarized in *Table 4*.

Table 4: Area 1 - Trip Generation

Land Use Code	Size (dwelling units)	Trip Generation Rate[3] AM (PM)	Weekday AM Peak Hour			Weekday PM Peak Hour		
			Entering	Exiting	TOTAL	Entering	Exiting	TOTAL
210 Single-Family Housing	1,207	0.71 (0.92)	216	646	862	699	411	1,110
220 Multifamily Housing (Low-Rise)	180	0.46 (0.56)	19	64	83	63	37	100
TOTAL	1,387		235	710	945	762	448	1,210

Based on these calculations, Area 1 is estimated to generate 945 vehicle trips in the AM peak hour and 1,210 vehicle trips in the PM peak hour.

4.3 Trip Distribution and Assignment

4.3.1 Trip Distribution

Trips were distributed to the surrounding road network based on local knowledge of the area as well as the turning movement count (TMC) data collected at the study area intersections. This determined the percentage of traffic volumes at the limits of the study area for each existing roadway. The trip distribution is based on a specific entry point to the study area road network and applies to all site trips (trips "via" a certain road).

Table 5 summarizes the proposed trip distribution for the Area 1 development.

[3] Equivalent rate derived from fitted curve equation

Table 5: Estimated Site Trip Distribution

To/from:	Inbound	Outbound
South via Sunset Drive	25%	25%
East via St. George Street [CR 26]	10%	10%
East via Talbot Street	15%	15%
North via Wellington Road [CR 25]	20%	20%
North via Sunset Drive	25%	25%
North via Ford Road	5%	5%
Total	100%	100%

Table 6 shows the number of proposed vehicle trips that will be generated to each of the roadways during the AM and PM peak hours.

Table 6: Vehicle Trips Distributed

To/from:	Inbound	Outbound	In – AM Peak	Out – AM Peak	In – PM Peak	Out – PM Peak
South via Sunset Drive	25%	25%	59	178	191	112
East via St. George Street [CR 26]	10%	10%	24	71	76	45
East via Talbot Street	15%	15%	35	107	114	67
North via Wellington Road [CR 25]	20%	20%	47	142	152	90
North via Sunset Drive	25%	25%	59	178	191	112
North via Ford Road	5%	5%	12	36	38	22
Total	100%	100%	235	710	762	448

4.3.2 Trip Assignment

Given the significant size of Area 1, trips would be assigned to different routes dependent on where they would originate from within Area 1. The generated and assigned trips for the proposed development were separated into groups for the potential development areas north and south of Major Line.

The total area of developable land within Area 1 is 63 hectares, with 15 hectares found north of Major Line and 48 hectares found to the south of Major Line. As a result of the total land area as calculated, out of the 945 trips generated in the AM peak hour, 225 vehicle trips would originate from north of Major Line, with the remaining 720 vehicles trips generated from the south of Major Line. In the PM peak hour, out of 1,210 vehicle trips, 288 vehicle trips would originate from north of Major Line while 922 vehicle trips would be generated from the area south of Major Line.

4.3.2.1 Trips to the North of Major Line

All trips related to the area north of Major Line were assigned to use the proposed access to Major Line, as it is the sole access that is anticipated to serve this area. Trips to Sunset Drive to both the north and south were assigned along Major Line towards Sunset Drive, while all other trips were assigned along Major Line towards Ford Road.

In the AM peak hour, 56 inbound and 169 outbound trips were forecast to use the north leg of the Major Line access. In the PM peak hour, 181 inbound and 107 outbound trips were forecast to use this access.

4.3.2.2 Trips to the South of Major Line

For the developable lands found south of Major Line, three access points are assumed, accessing Sunset Drive, Wellington Road and Major Line.

Given the geographic area south of Major Line, some traffic would be split between the different accesses / intersections, as it is anticipated that accesses will link to Major Line, Sunset Drive and Wellington Road.

Table 7 summarizes the proposed trip assignment for vehicles within the developable lands found south of Major Line to the three access points.

Table 7: Vehicle Trips to the South – Trip Assignment

To/From:	Major Line Access	Wellington Road Access	Sunset Drive Access
South via Sunset Drive	0%	50%	50%
East via St. George Street [CR 26]	25%	75%	0%
East via Talbot Street	0%	75%	25%
North via Wellington Road [CR 25]	25%	75%	0%
North via Sunset Drive	33%	0%	67%
North via Ford Road	100%	0%	0%

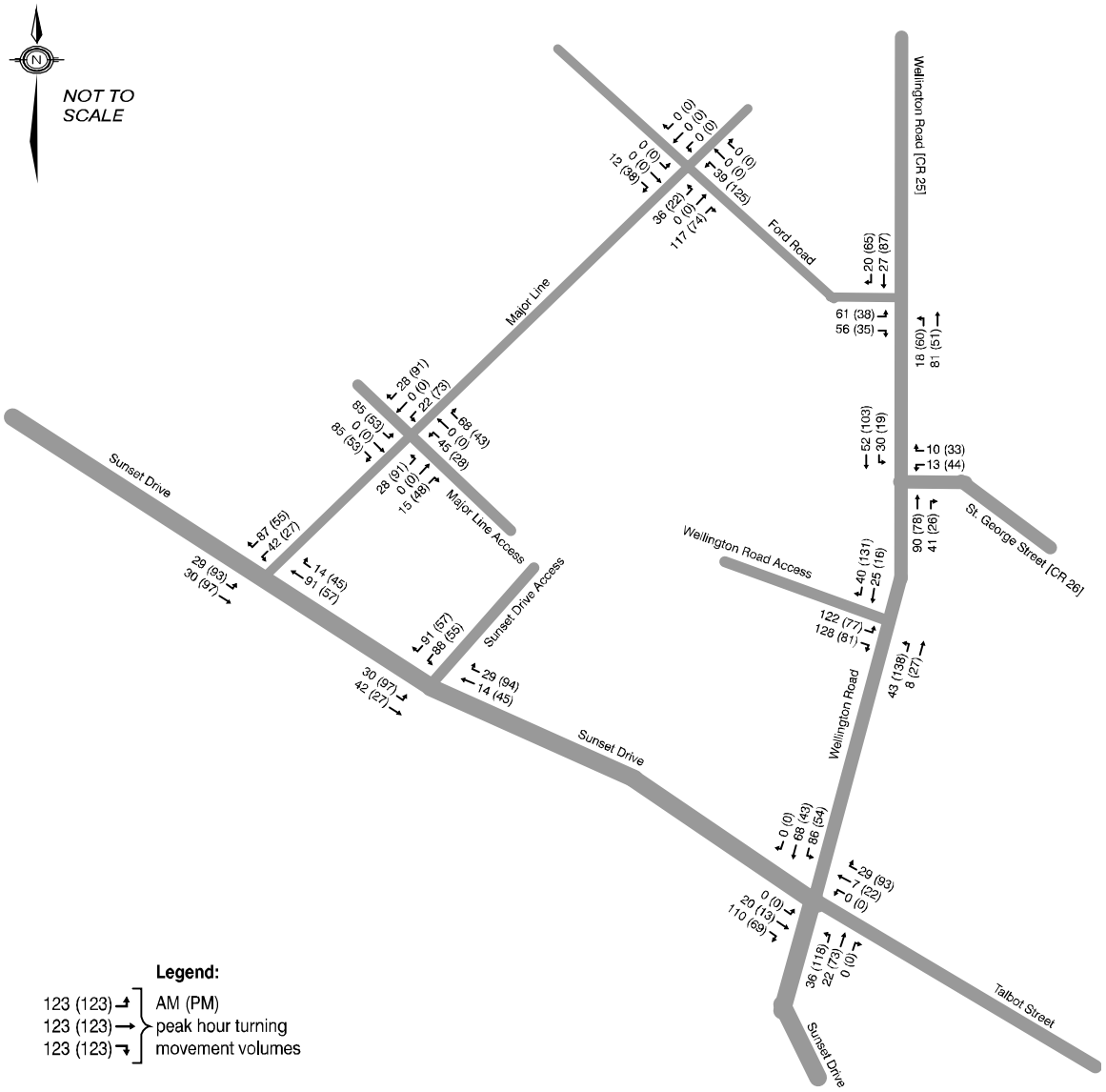
Table 8 summarizes the number of trips generated at each of the three proposed access points.

Table 8: Number of Vehicle Trips at Proposed Accesses

Access:	In – AM Peak	Out – AM Peak	Total – AM Peak	In – PM Peak	Out – PM Peak	Total – PM Peak
Major Line	37	112	149	120	71	191
Sunset Drive	59	179	238	192	112	304
Wellington Road	83	250	333	269	158	427
TOTAL	179	541	720	581	341	922

Figure 10 shows the number of site-generated vehicle trips at each of the study area intersections.

Figure 10: Site-Generated Traffic Volumes

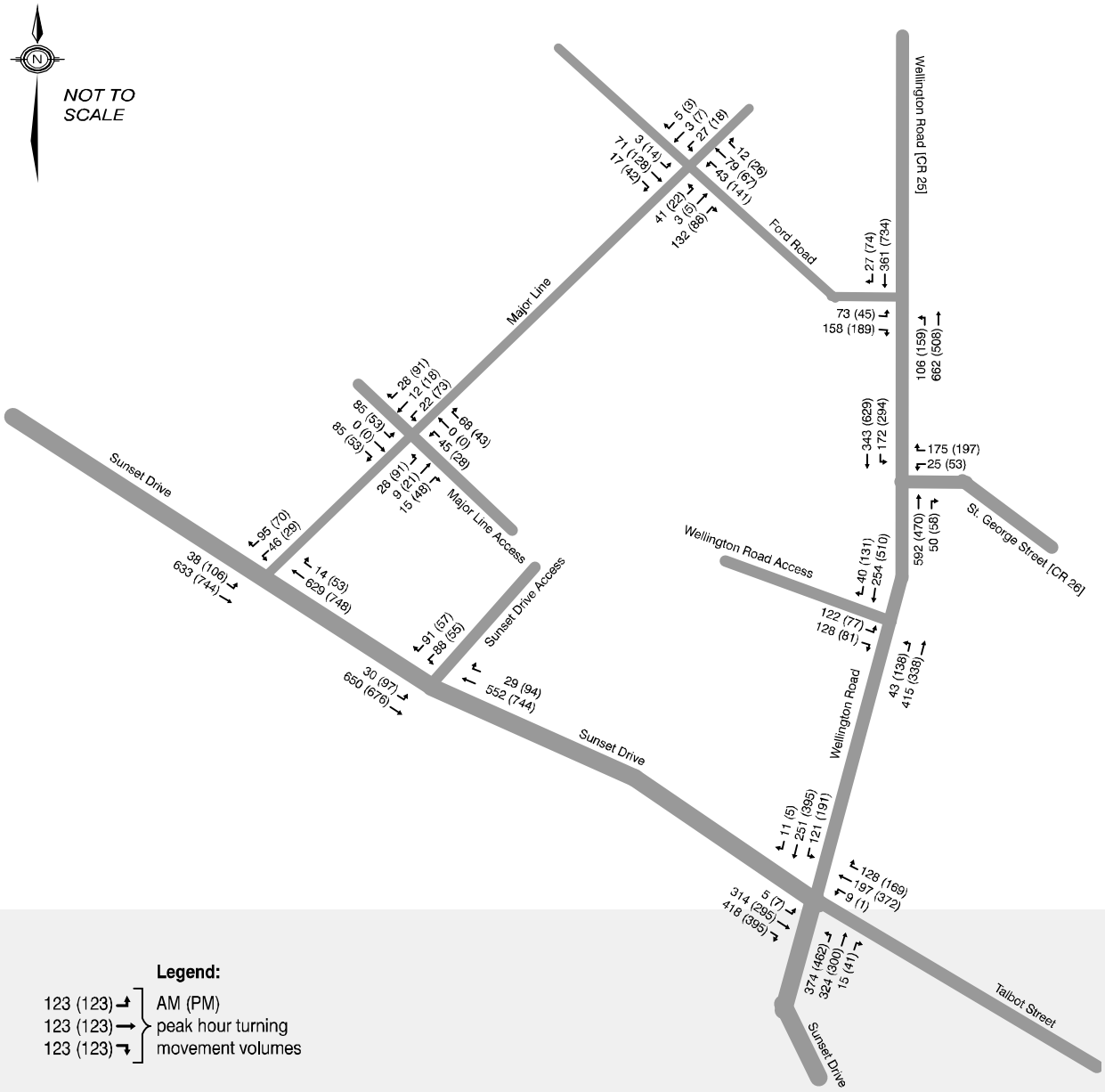


5.0 Total Future Conditions

5.1 Total Future Traffic Volumes

Total future traffic volumes represent the level of traffic that would be anticipated at the study area intersections with the development of Area 1, and were calculated by adding the Area 1 site traffic volumes to the projected future background traffic volumes. The resulting total future traffic volumes for the 2039 horizon year are illustrated in *Figure 11*.

Figure 11: Total Future (2039) Traffic Volumes



The percentage increase in overall traffic volumes at each of the study area intersection (five existing and three proposed) associated with the proposed development is presented in *Table 9*. The percentage increase is simply the difference between the future background traffic volumes and total future traffic volumes.

Table 9: Percentage Increase in Traffic at Study Area Intersections

Intersection	AM Peak Hour Increase	PM Peak Hour Increase
Existing Intersections:		
Major Line and Sunset Drive	25%	27%
Major Line and Ford Road	87%	86%
Ford Road and Wellington Road [CR 25]	23%	25%
Wellington Road [CR 25] and St. George Street [CR 26]	21%	22%
Sunset Drive, Wellington Road and Talbot Street	21%	23%
Proposed Intersections:		
Sunset Drive and the Site Access	26%	28%
Major Line and the Site Access	>100%	>100%
Wellington Road and the Site Access	58%	58%

5.2 Total Future Intersection Operations

Total future intersection operations were assessed using the same methodology as the existing (2019) conditions analyses.

5.2.1 Total Future Operations at Existing Intersections

Table 10 summarizes the intersection operations at the existing study area intersections under total future traffic volumes for the 2039 horizon year.

Table 10: Total Future Intersection Operations at Existing Intersections (2039)

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Sunset Drive & Major Line (Side Street STOP controlled) - *Synchro*								
Westbound approach	0.78	F	65.1	43.5	0.62	F	55.3	27.3
Northbound approach	0.43	A	0.0	0.0	0.50	A	0.0	0.0
Southbound approach	0.05	A	1.3	1.3	0.15	A	3.8	4.1
Overall	—	—	6.9	—	—	—	5.0	—

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Major Line & Ford Road (Side Street STOP controlled) - *Synchro*								
Southeast approach	0.00	A	0.3	0.1	0.01	A	0.7	0.2
Northwest approach	0.04	A	2.6	0.9	0.10	A	5.1	2.8
Northeast approach	0.26	B	10.9	8.4	0.18	B	11.4	5.1
Southwest approach	0.10	B	14.3	2.6	0.08	C	16.3	2.2
Overall	—	—	6.4	—	—	—	5.5	—
Wellington Road [CR 25] & Ford Road (Side Street STOP controlled) - *Synchro*								
Eastbound left	0.66	F	76.6	28.3	0.56	F	92.0	20.1
Eastbound right	0.30	B	13.3	9.9	0.51	C	22.9	22.0
Northbound left	0.11	A	8.7	3.0	0.22	B	10.9	6.6
Northbound through	0.45	A	0.0	0.0	0.32	A	0.0	0.0
Southbound through	0.24	A	0.0	0.0	0.46	A	0.0	0.0
Southbound right	0.02	A	0.0	0.0	0.05	A	0.0	0.0
Overall	—	—	7.1	—	—	—	2.8	—
Wellington Road [CR 25] & St. George Street [CR 26] (Side Street STOP controlled) - *Synchro*								
Westbound left	0.27	F	51.4	7.9	0.98	F	232.4	36.2
Westbound right	0.44	C	19.3	17.9	0.37	B	14.9	13.4
Northbound through	0.40	A	0.0	0.0	0.29	A	0.0	0.0
Northbound right	0.03	A	0.0	0.0	0.04	A	0.0	0.0
Southbound left	0.23	B	10.5	7.1	0.31	B	10.1	10.5
Southbound through	0.23	A	0.0	0.0	0.39	A	0.0	0.0
Overall	—	—	4.7	—	—	—	10.7	—
Wellington Road, Sunset Drive, Talbot Street (Roundabout) – *Sidra*								
Northbound approach	0.82	B	16.2	86.9	0.99	D	43.2	245.4
Westbound approach	0.26	A	7.6	13.4	0.48	A	10.0	30.1
Southbound approach	0.51	A	9.4	25.1	0.91	C	27.9	110.0
Eastbound approach	0.41	A	5.6	20.1	0.48	A	7.3	27.9
Overall	—	B	10.1	—	—	C	23.4	—

With the added Area 1 traffic and background traffic growth, and comparing to the existing (2019) operations, a number of movements are forecast to fail and / or approach capacity.

At the Sunset Drive and Major Line intersection, the westbound approach is expected to operate at LOS F in both the AM and PM peak hours. This approach is also expected to have vehicle queues extend up to 44 metres in the AM peak hour and 27 metres in the PM peak hour.

At the Major Line and Ford Road intersection, all movements and approaches are envisioned to operate well under capacity.

At the Wellington Road [CR 25] and Ford Road intersection, the eastbound left turn movement is forecast to operate at LOS F in both the AM and PM peak hours. In addition, the forecast 95th percentile queues in the AM peak hour (28.3 metres) are expected to meet and / or exceed the available storage of the adjacent right turn only lane. As a result, right-turning vehicles may occasionally be blocked out by the queue of left-turning vehicles.

At the Wellington Road [CR 25] and St. George Street [CR 26] intersection, the westbound left turn movement is expected to operate at LOS F in both the AM and PM peak hours. In addition, this movement is forecast to approach capacity (v/c ratio of 0.98) in the PM peak hour. Separately, the forecast 95th percentile queue in the PM peak hour (36.2 metres) is expected to meet and / or exceed the available storage of the adjacent right turn only lane. As a result, right-turning vehicles may occasionally be blocked out by the queue of left-turning vehicles.

At the roundabout of Wellington Road, Sunset Drive and Talbot Street, the intersection is envisioned to operate acceptably in the AM peak hour, although the 95th percentile queue for the northbound approach is forecast to extend to 86.9 metres. In the PM peak hour, both the northbound and southbound approaches are nearing capacity (v/c of 0.99 for northbound approach and 0.91 for southbound approach), and both approaches are forecast to have 95th percentile queues in excess of 100 metres (245.4 metres for the northbound approach and 110.0 metres for the southbound approach).

Potential solutions and recommendations to add vehicular capacity as well as to reduce vehicular delay and / or queuing are discussed within *Section 6.0*.

5.2.2 Total Future Operations at Proposed Intersections

Three potential intersections along existing corridors connecting directly to Area 1 were also considered and analysed. These intersections are:

- Major Line and the Major Line site access;
- Sunset Drive and the Sunset Drive site access; and
- Wellington Road and the Wellington Road site access.

The proposed intersection along Major Line is anticipated to be a four-legged intersection. Within the total future analysis, it was assumed there would be exclusive left turn lanes on all four approaches, with the future northwest and southeast legs being stop controlled with traffic on Major Line having the right-of-way.

The proposed intersection along Sunset Drive is anticipated to be a three-legged intersection. Within the total future analyses, it was assumed there would be a southeast bound left turn lane, a northwest bound right turn lane on Sunset Drive as well as separate southwest bound right and left turn lanes

along the proposed site access. The northeast leg would be stop controlled with traffic on Sunset Drive having the right-of-way.

The proposed intersection along Wellington Road is anticipated to be a three-legged intersection. Within the total future analyses, it was assumed there would be a northbound left turn lane, a southbound right turn lane as well as separate eastbound right and left turn lanes along the proposed site access. The west leg would be stop controlled with traffic on Wellington Road having the right-of-way.

For all three proposed intersections, all turn lanes were analysed with 50 metres of available storage. *Table 11* summarizes the intersection operations at the three proposed study area intersections under total future traffic volumes for the 2039 horizon year.

Table 11: Total Future Intersection Operations at Proposed Intersections (2039)

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Major Line & Major Line Access (Side Street STOP controlled) - *Synchro*								
Southeast left	0.14	B	11.3	3.8	0.12	B	13.4	3.2
Southeast thru/right	0.09	A	8.8	2.3	0.06	A	8.6	1.4
Northwest left	0.08	B	11.1	2.0	0.06	B	13.1	1.6
Northwest thru/right	0.07	A	8.6	1.8	0.05	A	8.7	1.2
Northeast left	0.02	A	7.3	0.5	0.06	A	7.5	1.6
Northeast thru/right	0.02	A	0.0	0.0	0.04	A	0.0	0.0
Southwest left	0.02	A	7.3	0.4	0.04	A	7.5	0.9
Southwest thru/right	0.03	A	0.0	0.0	0.03	A	0.0	0.0
Overall	—	—	8.0	—	—	—	6.7	—
Sunset Drive & Sunset Drive Access (Side Street STOP controlled) - *Synchro*								
Southeast left	0.03	A	8.9	0.9	0.14	B	10.6	3.9
Southeast through	0.42	A	0.0	0.0	0.43	A	0.0	0.0
Northwest through	0.35	A	0.0	0.0	0.48	A	0.0	0.0
Northwest right	0.02	A	0.0	0.0	0.06	A	0.0	0.0
Southwest left	0.62	F	60.0	26.8	0.74	F	127.5	29.0
Southwest right	0.20	B	13.9	5.8	0.16	C	16.3	4.6
Overall	—	—	4.7	—	—	—	5.2	—
Wellington Road & Wellington Road Access (Side Street STOP controlled) - *Synchro*								
Eastbound left	0.40	C	22.9	14.9	0.51	E	47.0	19.8
Eastbound right	0.18	B	10.8	5.3	0.17	B	13.1	4.7
Northbound left	0.04	A	8.0	0.9	0.17	A	9.8	4.8
Northbound through	0.27	A	0.0	0.0	0.22	A	0.0	0.0
Southbound through	0.16	A	0.0	0.0	0.33	A	0.0	0.0
Southbound right	0.03	A	0.0	0.0	0.08	A	0.0	0.0
Overall	—	—	4.5	—	—	—	4.7	—

At the proposed four-legged intersection on Major Line, all approaches are projected to operate well under capacity, with minimal delay and queuing anticipated on all approaches.

At the proposed three-legged intersection on Sunset Drive, the southwest bound left turn movement is forecast to operate at LOS F in both the AM and PM peak hours, with delays estimated to be one minute in the AM peak hour and slightly over two minutes in the PM peak hour. The forecast 95th percentile queue for this southwest movement is anticipated to be between 25 and 30 metres in both the AM and PM peak hours.

At the proposed three-legged intersection on Wellington Road, the eastbound left turn movement is forecast to operate at LOS C and LOS E in the AM and PM peak hours respectively, with delays estimated to be 23 and 47 seconds in the AM and PM peak hours, respectively. The forecast 95th percentile queue for this eastbound movement is anticipated to be between 15 and 20 metres in both the AM and PM peak hours.

6.0 Potential Improvements

6.1 Intersection Control at Existing Intersections

Based on the forecast increase to traffic volumes at the existing and proposed study area intersections, a number of potential improvements are recommended or could be considered to improve vehicular operations by the 2039 horizon year.

6.1.1 Sunset Drive and Major Line

Under the jurisdiction of St. Thomas, the three-legged intersection of Sunset Drive and Major Line is currently controlled as a side-street STOP controlled intersection, with vehicles on Sunset Drive having the right-of-way, and vehicles on Major Line having to stop prior to entering the intersection.

Under total future conditions (as seen in *Table 10*), the current stop control approach on Major Line is expected to operate at LOS F in both the AM and PM peak hours.

As Sunset Drive is classified as a "highway or major county" road within the City of St. Thomas's Official Plan, converting this intersection to all-way stop control would likely not be appropriate, even if warranted. Therefore, signal warrant calculations have been undertaken to determine if the additional traffic volumes would trigger the need to signalize this intersection under total future conditions.

6.1.1.1 Sunset Drive and Major Line - Signal Warrant Calculations

Using the guidelines provided within the *Ontario Traffic Manual: Book 12 – Traffic Signals*, a signal warrant assessment was completed for the 2039 horizon year based on total future volumes. These analyses can be found in *Appendix F*.

The traffic signal warrant assessment considers traffic volumes over an 8-hour period. As the turning movement count data was collected for 3-hours in the AM and PM peak hours respectively, the lowest AM and PM peak hour volume for both respective periods was utilized to fill in the remaining hours in each period to allow full 8-hour volumes to be calculated. Therefore, the 8-hour analysis period was estimated to be between 7:00 AM and 11:00 AM and again from 2:00 PM to 6:00 PM.

In addition, the hourly distribution of residential trips was based on the methodology contained within the January 2015 ITE Journal article *Hourly Variation for Office and Residential Land* Uses. This distribution was used to create hour-by-hour volumes for Area 1 as well as for the other two background developments. This article is included in *Appendix G*.

Under future background traffic volumes, the first justification (minimum vehicular volume warrant) scored 8%, while the second justification (delay to cross traffic warrant) had a score of 8%. Since neither justification was met, and combined, neither justification was above 80%, a traffic signal is not expected

to be warranted at the Major Line and Sunset Drive intersection based on future background traffic volumes.

In addition, under total future traffic volumes, the first justification (minimum vehicular volume warrant) scored 57%, while the second justification (delay to cross traffic warrant) had a score of 65%. Since neither justification was met, and combined, neither justification was above 80%, a traffic signal is not expected to be warranted at the Major Line and Sunset Drive intersection based on total future traffic volumes.

The evaluation for additional turning lanes at this intersection is discussed in *Section 6.3.1*.

6.1.1.2 Sunset Drive and Major Line – Roundabout Analysis

While a traffic signal is not warranted, there may be an opportunity for a roundabout to be introduced at the Sunset Drive and Major Line intersection.

Table 12 outlines the forecast operations of a single-lane roundabout at the Sunset Drive and Major Line intersection.

Table 12: Roundabout Operations - Sunset Drive and Major Line

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Sunset Drive and Major Line (Single-Lane Roundabout) – *Sidra*								
Northbound approach	0.44	A	4.4	25.4	0.62	A	5.1	42.4
Westbound approach	0.20	A	10.0	8.7	0.15	B	10.3	6.9
Southbound approach	0.48	A	4.8	32.0	0.57	A	4.9	45.2
Overall	—	A	5.1	—	—	A	5.3	—

At the Sunset Drive and Major Line intersection, a single lane roundabout is forecast to operate in an excellent manner during both the AM and PM peak hours under total future traffic volumes. There would be minimal delay and queuing along all three approaches during both the AM and PM peak hours.

6.1.2 Major Line and Ford Road

Under the jurisdiction of Southwold Township, the four-legged intersection of Major Line and Ford Road is currently controlled as a side-street STOP controlled intersection, with vehicles on Ford Road having the right-of-way, and vehicles on Major Line having to stop prior to entering the intersection.

Under total future conditions (as seen in *Table 10*), the current stop control approaches on Major Line are forecast to operate at LOS B during the AM peak hour. In the PM peak hour, the northeast approach is forecast to operate at LOS B while the southwest approach is expected to operate at LOS C.

Based on forecast operations at this intersection, changes to traffic control are not required at the Major Line and Ford Road intersection.

The evaluation for additional turning lanes at this intersection is discussed in *Section 6.3.2*.

6.1.3 Wellington Road [CR **25**] and Ford Road

Under the jurisdiction of Elgin County, the three-legged intersection of Wellington Road (Elgin County Road 25) and Ford Road is currently controlled as a side-street STOP controlled intersection, with vehicles on Wellington Road (Elgin County Road 25) having the right-of-way, and vehicles on Ford Road having to stop and yield the right-of-way prior to entering the intersection.

Under total future conditions (as seen in *Table 10*), the current stop control approach on Ford Road at Wellington Road (Elgin County Road 25) is forecast to operate at LOS D during the AM peak hour and LOS E during the PM peak hour, with the eastbound left turn movement expected to operate at LOS F in both peak periods. In addition, the 95th percentile queue for the eastbound left turn movement is forecast to meet / exceed the available storage for the adjacent right turn only lane in both the AM and PM peak hours, meaning some right-turning vehicles may be blocked out due to left-turning vehicle queues. Therefore, storage in the right turn lane on Ford Road should be increased to at least 30 metres, to allow right-turning vehicles to bypass queued left-turning vehicles.

As Wellington Road (Elgin County Road 25) is classified as a county road by Elgin County, the decision and timing to provide a solution at this intersection is at the discretion of Elgin County.

6.1.4 Wellington Road [CR **25**] and St. George Street [CR **26**]

Under the jurisdiction of Elgin County, the three-legged intersection of Wellington Road (Elgin County Road 25) and St. George Street (Elgin County Road 26) is currently controlled as a side-street STOP controlled intersection. Vehicles on Wellington Road (Elgin County Road 25) currently have the right-of-way while vehicles on St. George Street (Elgin County Road 26) need to stop and yield the right-of-way prior to entering the intersection.

Under total future conditions (as seen in *Table 10*), the current stop control approaches on St. George Street (Elgin County Road 26) at Wellington Road (Elgin County Road 25) is forecast to operate at LOS F during both the AM and PM peak hours.

As Wellington Road (Elgin County Road 25) is classified as a county road by Elgin County, the decision and timing to provide a solution at this intersection is at the discretion of Elgin County.

6.1.5 Sunset Drive, Wellington Road and Talbot Street

Under the jurisdiction of St. Thomas, the four-legged intersection of Sunset Drive, Wellington Road, and Talbot Street operates as a roundabout.

Under total future conditions, this intersection is anticipated to function at an acceptable level in both the AM and PM peak periods, operating at overall LOS B in the AM peak hour, and overall LOS C in the PM peak hour. However, the single lane approaches in both the northbound and southbound directions in the PM peak hour are forecast to be above critical levels (v/c of 0.91 and 0.99). Queues in both of these directions are also forecast to exceed 100 metres during the same peak period.

In order to add capacity, an additional lane in both the northbound and southbound directions was evaluated. This additional lane would extend 100 metres from the entry and departure points of the roundabout on both the north and south legs. As a result, the roundabout of Sunset Drive, Wellington Road and Talbot Street was analysed with having two lanes along all approaches. The intersection operations for this intersection with these improvements can be seen in *Table 13*.

Table 13: Roundabout Operations - Multi-Lane Approach on All Legs

Movement	Weekday AM peak hour				Weekday PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Wellington Road, Sunset Drive, Talbot Street (Roundabout) – *Sidra*								
Northbound approach	0.36	A	8.8	15.9	0.46	A	9.7	22.6
Westbound approach	0.20	A	5.8	6.5	0.34	A	6.2	12.7
Southbound approach	0.21	A	7.6	7.9	0.38	A	9.1	15.8
Eastbound approach	0.38	A	5.1	14.9	0.40	A	5.7	15.2
Overall	—	A	6.9	—	—	A	7.8	—

By implementing an additional lane to the north and south legs on both the approach and departure, the intersection operation improves dramatically in the PM peak hour. The northbound approach operates at LOS A with minimal delay and well under capacity (v/c = 0.46). The 95th percentile queue length would also be reduced by over 200 metres to 23 metres. The southbound approach also operates at LOS A with minimal delay and well under capacity (v/c = 0.38). The 95th percentile queue length would also be reduced by approximately 95 metres to 15 metres total.

6.2 Intersection Control at Proposed Area 1 Intersections

6.2.1 Major Line and Proposed Area 1 Access

Under total future conditions (as seen in *Table 11*), the assumed stop control approaches on the access roadways to Major Line are forecast to operate at LOS A and LOS B in both the AM and PM peak hours. Based on forecast operations at this intersection, changes to traffic control are not required and the

side-street approaches are forecast to operate in a satisfactory manner under two-way stop control (TWSC) operations. However, a single-lane roundabout should be considered at this location within the next stages of development.

6.2.2 Sunset Drive and Proposed Area 1 Access

Under total future conditions (as seen in *Table 11*), the assumed stop control approach (southwest bound left) on the access roadway to Sunset Drive is forecast to operate at LOS F in both the AM and PM peak hours. Therefore, signal warrant calculations have been undertaken to determine if the additional traffic volumes would trigger the need to signalize this intersection under total future conditions.

6.2.2.1 Sunset Drive and Proposed Site Access – Signal Warrant

Using the guidelines provided within the *Ontario Traffic Manual: Book 12 – Traffic Signals*¸ a signal warrant assessment was completed for the 2039 forecast year using Justification 7 – Projected Volumes since the intersection does not currently exist. These analyses can be found in *Appendix F*.

The traffic signal warrant assessment for any future intersection considers traffic volumes over a shorter period, with the sum of the AM and PM peak hour volumes combined and divided by four to determine the average hourly volume (AHV).

Under total future traffic volumes, the first justification (minimum vehicular volume warrant) was calculated to meet 41% of the warrant, while the second justification (delay to cross traffic warrant) achieved 144% of the warrant threshold. For any proposed intersection using the average hourly volume (AHV) methodology, Justification 7 must be met to at least 150% of the warrant. Therefore, a traffic signal has been estimated to be slightly below the warrant threshold at the proposed Area 1 site access to Sunset Drive intersection when considering Justification 7.

However, once Area 1 is built out, it is likely that a traffic signal will be warranted given that the signal warrant methodology within OTM Book 12 requires lower thresholds be met for an existing intersection compared to a proposed intersection. As a result, the introduction of a future traffic signal at the proposed Area 1 site access to Sunset Drive should be anticipated from a cost estimate standpoint.

6.2.3 Wellington Road and Proposed Area 1 Access

Under total future conditions (as seen in *Table 11*), the assumed stop control approach (eastbound left) on the access roadway to Wellington Road is forecast to operate at LOS C in the AM peak hour and LOS E in the PM peak hour. Therefore, signal warrant calculations have been undertaken to determine if the additional traffic volumes would trigger the need to signalize this intersection under total future conditions. During the next stage of development a single-lane roundabout should also be considered at this location.

6.2.3.1 Wellington Road and Proposed Area 1 Site Access – Signal Warrant

Using the guidelines provided within the *Ontario Traffic Manual: Book 12 – Traffic Signals*, a signal warrant assessment was completed for the 2039 forecast year using Justification 7 – Projected Volumes since the intersection does not currently exist. These analyses can be found in *Appendix F*.

The traffic signal warrant assessment for any future intersection considers traffic volumes over a shorter period, with the sum of the AM and PM peak hour volumes combined and divided by four to determine the average hourly volume (AHV).

Under total future traffic volumes, the first justification (minimum vehicular volume warrant) was calculated to meet 57% of the warrant, while the second justification (delay to cross traffic warrant) achieved 98% of the warrant threshold. For any proposed intersection using the average hourly volume (AHV) methodology, Justification 7 must be met to be at least 150% of the warrant. Therefore, a traffic signal has not been calculated to be warranted at the proposed Area 1 site access and Wellington Road intersection when considering Justification 7.

However, once Area 1 is built out, it is likely that a traffic signal will be warranted given that the signal warrant methodology within OTM Book 12 requires lower thresholds be met for an existing intersection compared to a proposed intersection. As a result, the introduction of a future traffic signal at the proposed Area 1 site access to Wellington Road should be anticipated from a cost estimate standpoint.

6.3 Turning Lanes

Based on total future volumes and operational conditions, analysis was undertaken at several existing intersections to determine if exclusive right or left turn lanes are warranted based on total future traffic volumes.

Within the TAC *Geometric Design Guide for Canadian Roads*, right turn auxiliary lanes are recommended at an unsignalized intersection "when the volume of decelerating or accelerating vehicles compared with the through traffic volume causes undue hazard". At a signalized intersection, right turn lanes should be considered when the volume of right turning traffic is 10% to 20% of the total approaching volume.

For left turn lanes, left turn lane warrant analysis (nomographs) is relied upon to determine if a turn lane is warranted. This analysis methodology can be found within the Ministry of Transportation of Ontario's (MTO) design supplement to TAC's *Geometric Design Guide for Canadian Roads*. The nomographs are based on the design speed of the road, and traffic volumes for both the left turn movement and in the opposing direction. These parameters identify if a left turn lane is warranted, and if so, provide a recommended storage length for the lane.

6.3.1 Sunset Drive and Major Line

6.3.1.1 Northwest-bound Right Turn Lane on Sunset Drive

Under total future volumes, the northwest approach volume is forecast to be 642 vehicles in the AM peak hour and 801 vehicles in the PM peak hour. In the AM peak hour, 14 vehicles (2%) are forecast to turn right from northwest-bound Sunset Drive onto northeast-bound Major Line. In the PM peak hour, 53 vehicles (6%) are forecast to turn right.

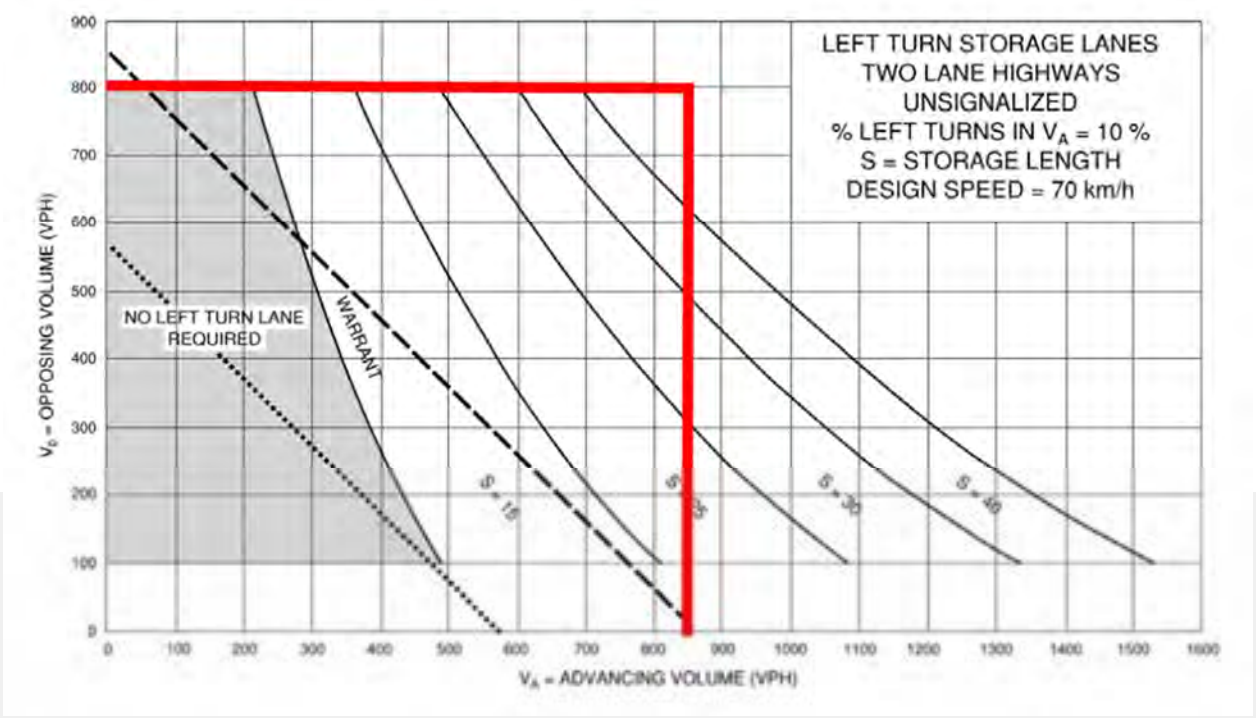
Given that less one vehicle per minute is forecast to turn right at this intersection in the PM peak hours, and the northwest-bound approach is forecast to operate at LOS A in both the AM and PM peak hours, a northwest-bound right turn lane on Sunset Drive at Major Line is not warranted.

6.3.1.2 Southeast-bound Left Turn Lane on Sunset Drive

Under total future volumes, the southeast approach volume is forecast to be 671 vehicles in the AM peak hour and 851 vehicles in the PM peak hour. In the AM peak hour, 38 vehicles (6%) are forecast to turn left from southeast-bound Sunset Drive onto northeast-bound Major Line. In the PM peak hour, 106 vehicles (12%) are forecast to turn left.

Given the posted speed limit is 60 km/h on Sunset Drive at Major Line, a design speed of 70 km/h was used. Given the peak hour volumes and left turn percentages were higher in the PM peak hour, these volumes are utilized within the analysis. The results can be seen in *Figure 12*.

Figure 12: Southeast-Bound Left Turn Lane Warrant on Sunset Drive at Major Line



Based on the forecast volumes, a left turn lane with a minimum 40 metres of storage is warranted in the southeast bound direction of Sunset Drive at Major Line. Additional parallel length and appropriate tapers should be considered within the left turn lane design.

6.3.1.3 Separate Southwest-bound Right and Left Turn Lanes on Major Line

Within the Synchro analysis for the Major Line and Sunset Drive intersection, the southwest bound approach of Major Line at Sunset Drive operates at LOS F in both the AM and PM peak hour without traffic control signals in place. To more efficiently serve traffic on the Major Line approach, a separate right turn lane is recommended. In the AM peak hour, the 95th percentile queue is forecast to extend for 44 metres, while in the PM peak hour, this queue was measured at 27 metres.
Therefore, an exclusive right turn lane with a minimum of 45 metres storage is recommended on Major Line approaching Sunset Drive.

6.3.2 Major Line and Ford Road

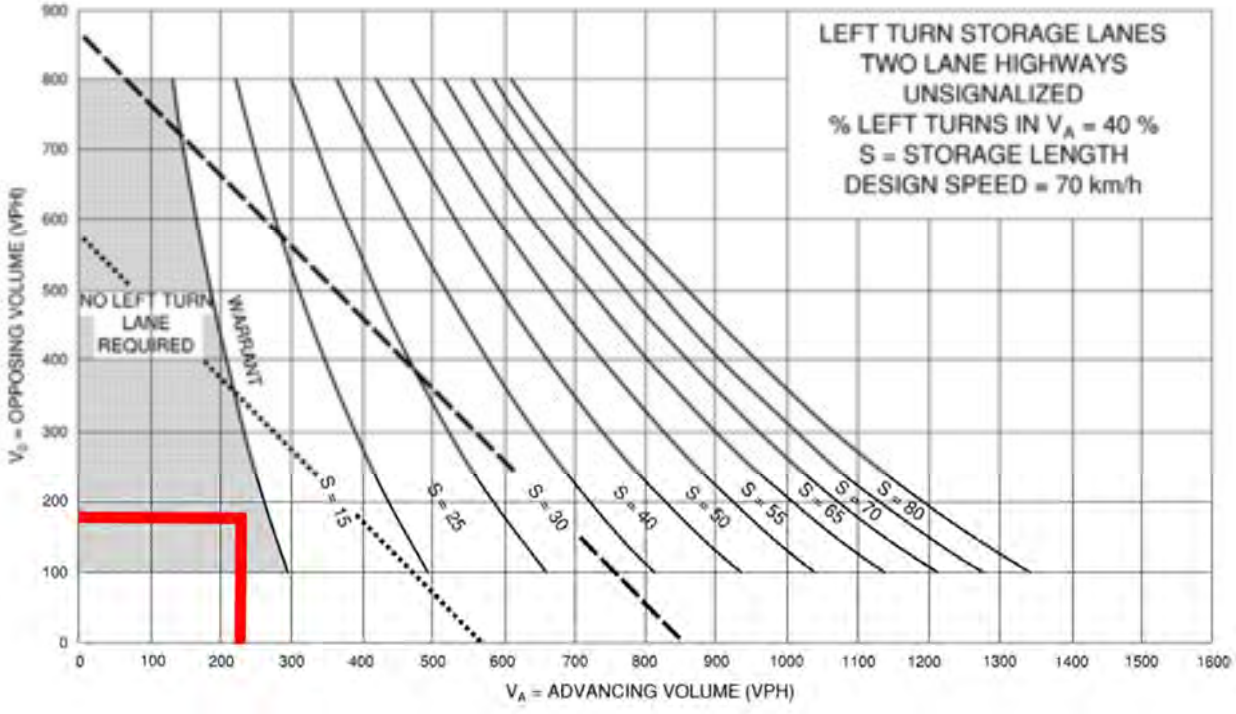
While there is no need for any intersection traffic control changes at the Major Line and Ford Road intersection, the need for turn lanes were evaluated for one approach due to the forecast volume and high turning movement percentages.

6.3.2.1 Northwest-bound Left Turn Lane on Ford Road

Under total future volumes, the northwest approach volume is forecast to be 133 vehicles in the AM peak hour and 233 vehicles in the PM peak hour. In the AM peak hour, 43 vehicles (32%) are forecast to turn left from northwest-bound Ford Road onto southwest-bound Major Line. In the PM peak hour, 141 vehicles (61%) are forecast to turn left.

Given the posted speed limit is 60 km/h on Ford Road at Major Line, a design speed of 70 km/h was used. Given the peak hour volumes and left turn percentages were higher in the PM peak hour, these volumes are utilized within the analysis. The results can be seen in *Figure 13*.

Figure 13: Northwest Bound Left Turn Lane Warrant on Ford Road at Major Line



Based on the forecast volumes, a left turn lane is not warranted in the northwest-bound direction of Ford Road at Major Line.

Given all other turning and through volumes at the Ford Road and Major Line intersection were lower than this northwest left turn movement, no other analyses for turn lanes along the other approaches at this intersection was undertaken.

6.3.3 Sunset Drive, Wellington Road and Talbot Street

As the Sunset Drive, Wellington Road and Talbot Street intersection operates as a multi-lane roundabout, turn lanes are typically not included. However, as seen in *Section 6.1.5.*, additional approach and departure lanes in both the northbound and southbound directions should be considered to assist with providing additional capacity at this intersection. The additional lanes are recommended to extend a minimum 100 metres from the roundabout in both directions.

7.0 Alternative Transportation Modes

7.1 Transit Network Expansion

The City of St. Thomas operates a conventional and parallel (accessible) transit service within the city. It operates five conventional routes from 7:15 AM to 6:45 PM on weekdays and 9:15 AM to 6:45 PM on Saturdays. No Sunday / Holiday service is provided. These five routes operate on a 30-minute frequency throughout the available service period. In addition, two "student express" routes operate on school days with two trips occurring exclusively in the AM and PM school peak hours respectively. All of these routes meet a central transfer point found near the Walmart located on the northeast corner of Talbot Street and First Street.

Figure 14 shows the current St. Thomas Transit network.

Figure 14: St. Thomas Transit Network



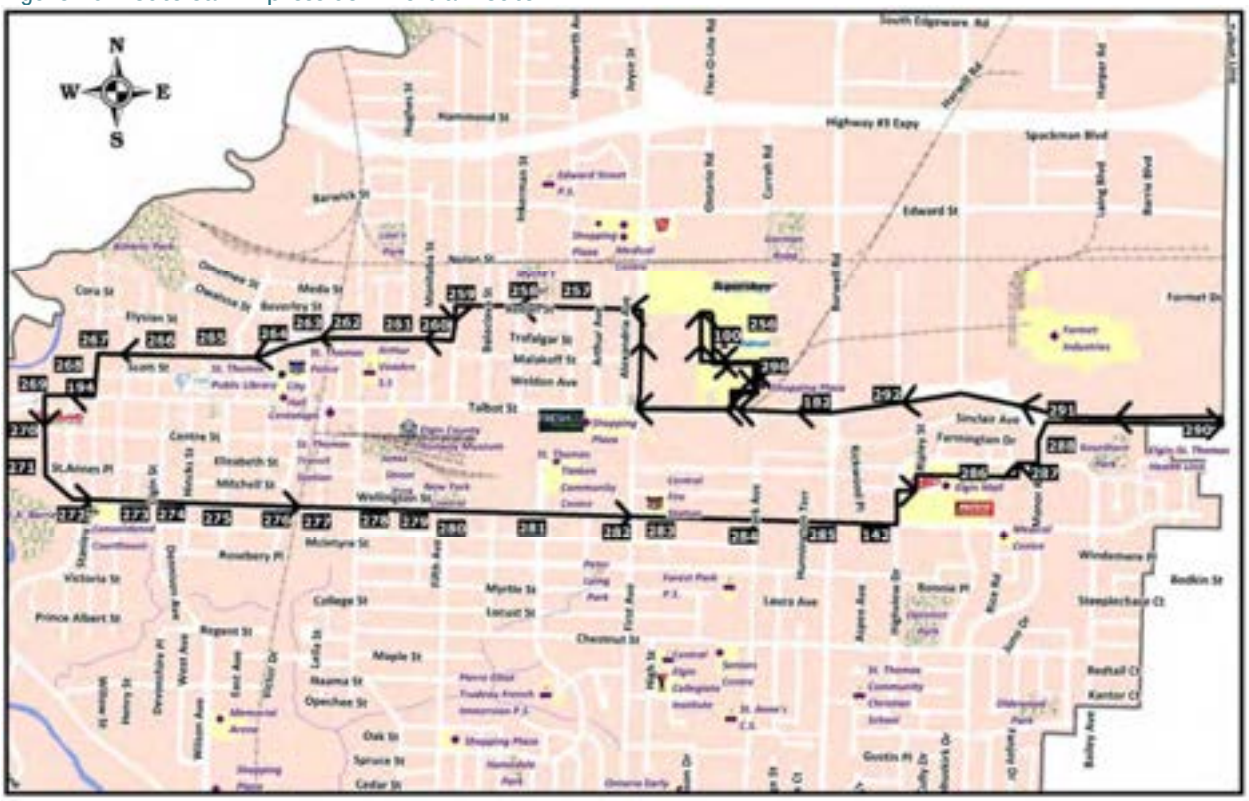
Two transit routes operate within the west limits of the built-up urban area within the City of St. Thomas. As seen in *Figure 14*, this includes Route 3 – Talbot Route (shown in cyan) and Route 5a – Express Commercial Route (shown in blue).

Figure 15 shows the present routing and stopping pattern for Route 3 – Talbot Route while *Figure 16* shows the present routing and stopping pattern for Route 5a – Express Commercial Route.

Figure 15: Route 3 - Talbot Route Map



Figure 16: Route 5a – Express Commercial Route



Both Route 3 and Route 5a are within the closest proximity to Area 1. Currently, both routes take 25 minutes to complete. Extending either of these routes would result in an impact on the travel time and / or route frequency compared to existing.

Given the large expanse (63 ha) that Area 1 will allow for residential development, and that 1,387 residential units are anticipated, there would be value in introducing conventional transit service to Area 1 once the core internal road network is established with the planned connections out to the broader road network.

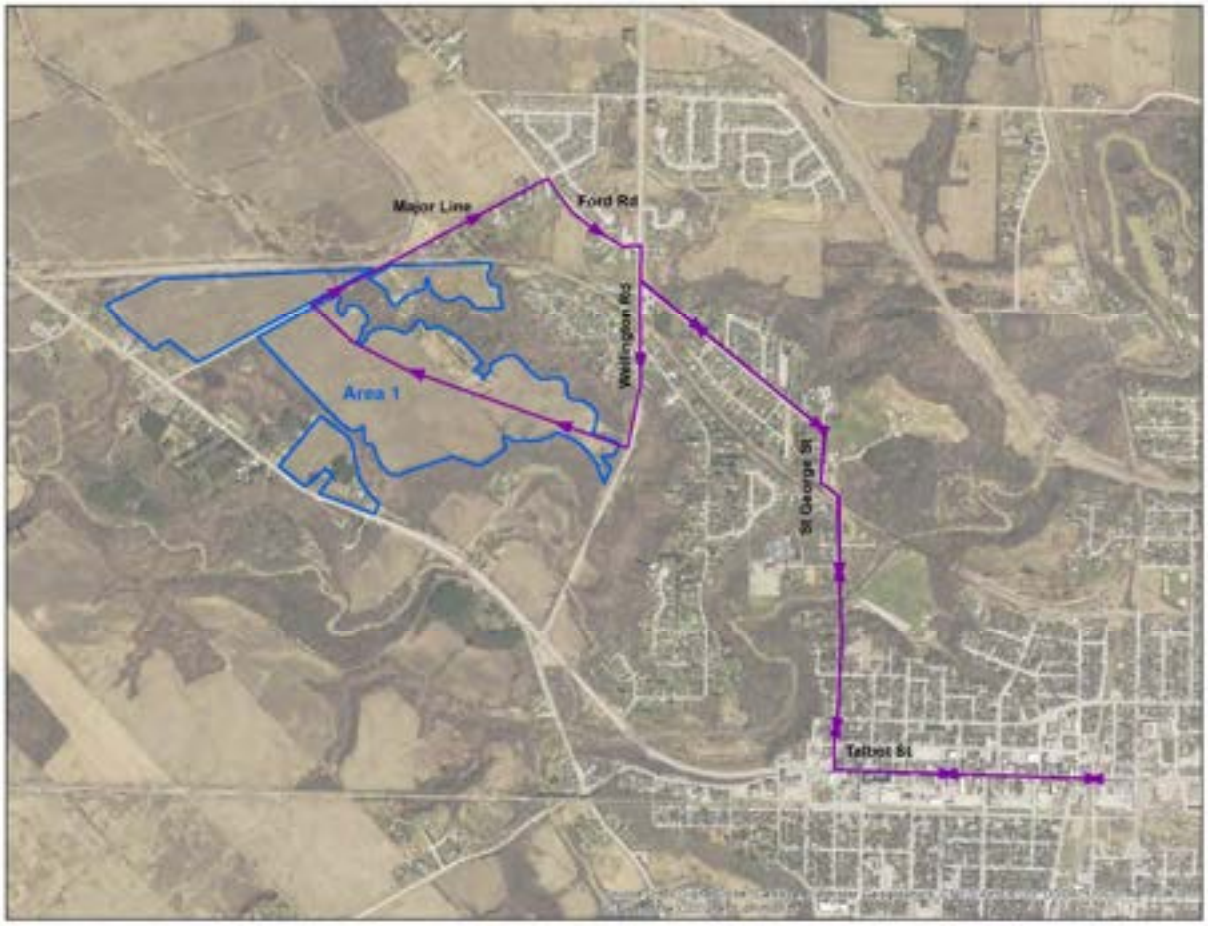
Given the current boundaries of St. Thomas, the only routing available within the City limits between the Central Transit Terminal (at Walmart) would be along Talbot Street through the roundabout with Wellington Street and Sunset Drive, and then completing a one-way loop through Area 1, using parts of Sunset Drive, Wellington Street and Major Line for connectivity. In order to maintain the trip times and frequency, this route would generally need to operate with limited stops along Talbot Street, and with increased transit stops west of the St. George Street and Talbot Street intersection. Some rationalization between this potential new transit route and the existing Route 3 and Route 5a could also be considered, as these three routes would generally be along or adjacent to the Talbot Street corridor within downtown St. Thomas. *Figure 17* illustrates a potential route between Area 1 and the Central Transit Terminal along Talbot Street.

Figure 17: Potential Transit Routing between Downtown St. Thomas and Area 1



Should a transit route connect through Lyndhurst, consideration for an alternate route between the Transit Terminal and Area 1 could be made. A formal agreement between Elgin County and the Municipality of Central Elgin and the City of St. Thomas would need to be established to allow a transit route to operate partially outside of the City of St. Thomas limits. *Figure 18* illustrates the alternate transit route.

Figure 18: Alternate Transit Routing between Downtown St. Thomas and Area 1 via Lyndhurst



7.2 Active Transportation Opportunities

Currently, there is no active transportation infrastructure (sidewalks or cycling infrastructure) found on any of the existing roadways surrounding Area 1. Northeast of Area 1, some local residential streets including Major Line northeast of Ford Road do feature a sidewalk along one side of the roadway. In addition, a short section of sidewalk is found on the northeast side of Ford Road when approaching Wellington Road (Elgin County Road 25).

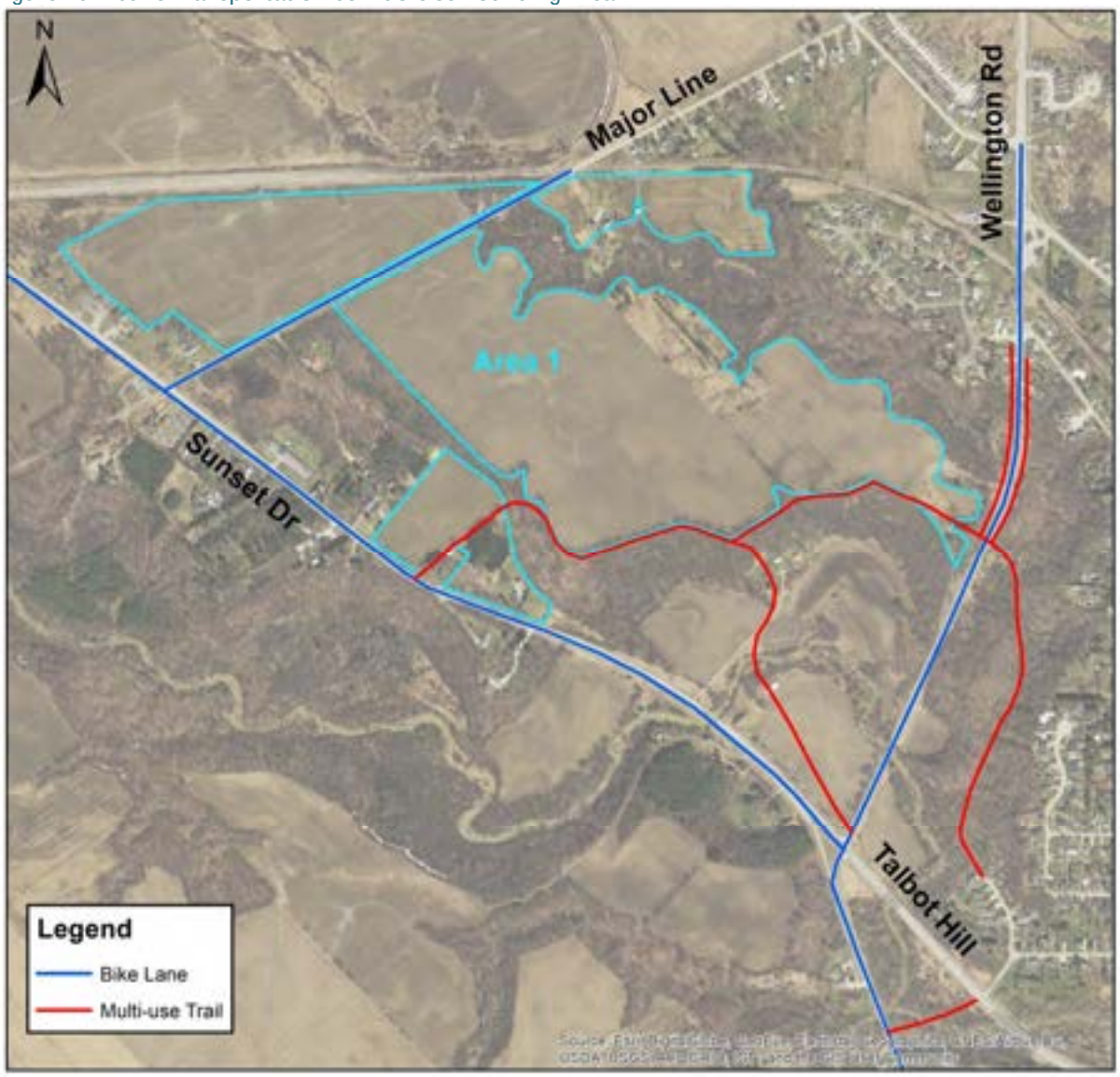
Within Area 1, it is assumed that all internal streets constructed will have sidewalks on one or both sides. Separately, where Area 1 fronts onto existing roadways (Wellington Road, Sunset Drive, Major Line), sidewalks should be introduced along the frontages.

If there are any through streets within Area 1 that will be classified as a collector road, including Major Line, cycling infrastructure (bike lanes, cycle tracks, or multi-use pathways) should be considered within the future design and cross-section of these streets.

At all future transit stops, infrastructure should be provided to ensure all stops are accessible and connect to active transportation infrastructure where possible.

Figure 19 illustrates the proposed active transportation connections in the vicinity of the development area.

Figure 19: Active Transportation Corridors Surrounding Area 1



8.0 Cost Estimates

As per the potential improvements, the following costs have been estimated to support Area 1 and are seen in *Table 14* through *Table 16.* The percentage growth due to development traffic is based on the percentage increase in overall peak hour traffic volumes at each of the study intersections or corridors between the future background and total future traffic volumes. These percentages can also be seen in *Table 9*.

Table 14: Estimated 2039 Costs for Improvements at Existing Intersections

Location	% Growth due to Development Traffic	Jurisdiction	Recommended Improvement	Estimated 2039 Costs
Sunset Drive & Major Line	25% - AM 27% - PM	City of St. Thomas	New Southbound Left Turn Lane with 40 metres storage	$90,000
			New Westbound Separate Right & Left Turn Lanes with 45 metres storage	$95,000
			New Single-lane roundabout	$515,000
Sunset Drive, Wellington Road and Talbot Street	21% - AM 23% - PM	City of St. Thomas	Additional Lane on North Leg extending 100 metres north of roundabout	$255,000
			Additional Lanes on South Leg extending 100 metres from roundabout	$255,000
TOTAL (Sunset Drive & Major Line as a two-way stop controlled intersection)				$695,000
TOTAL (Sunset Drive & Major Line as a single-lane roundabout)				$1,025,000

For the existing intersections under the jurisdiction of the City of St. Thomas, the estimated 2039 costs range from $695,000 to $1,025,000 depending on the control type (stop control or roundabout) at the intersection of Sunset Drive and Major Line.

No improvements are recommended at the Ford Road and Major Line intersection, which is under the jurisdiction of Southwold Township.

Table 15: Estimated 2039 Costs for Improvements along Existing Corridors

Location	% Growth due to Development Traffic	Jurisdiction	Recommended Improvement	Estimated 2039 Costs
Sunset Drive (Talbotville Gore Road to proposed Area 1 access)	25% - AM 27% - PM	City of St. Thomas	New Centre Left Turn Lane	$500,000
Major Line (Sunset Drive	>100% - AM	City of St.	2-lane Collector Road Upgrade with	$1,500,000

Location	% Growth due to Development Traffic	Jurisdiction	Recommended Improvement	Estimated 2039 Costs
to CN Railway)	>100% - PM	Thomas	Bike Lanes	
			TOTAL	$2,000,000

In order to upgrade portions of the Sunset Drive and Major Line corridors within the City of St. Thomas, the estimated 2039 costs are $2,000,000.

Table 16: Estimated 2039 Costs at Proposed Intersections

Location	% Growth due to Development Traffic	Jurisdiction	Recommended Improvement	Estimated 2039 Costs
Proposed 4-legged intersection on Major Line	>100% - AM >100% - PM	City of St. Thomas	Separate Northwest-bound Left Turn Only Lane with 50 metres of storage	$100,000
			New Southwest-bound Left Turn Only Lane with 50 metres of storage	$100,000
			New Northeast-bound Left Turn Only Lane with 50 metres of storage	$100,000
			Separate Southeast-bound Left Turn Only Lane with 50 metres of storage	$100,000
Proposed 3-legged intersection on Sunset Drive	26% - AM 28% - PM	City of St. Thomas	New Traffic Signal	$400,000
			New Southeast-bound Left Turn Only Lane with 50 metres of storage	$100,000
			New Northeast-bound Right Turn Only Lane with 50 metres of storage	$100,000
			Separate Southwest Left Turn Only Lane with 50 metres of storage	$100,000
Proposed 3-legged intersection on Wellington Road	58% - AM 58% - PM	City of St. Thomas	New Traffic Signal	$400,000
			New Southbound Right Turn Only Lane with 50 metres of storage	$100,000
			New Northbound Left Turn Only Lane with 50 metres of storage	$100,000
			Separate Eastbound Left Turn Only Lane with 50 metres of storage	$100,000
			TOTAL	$1,800,000

For the proposed three intersections within St. Thomas that would link Area 1 to Major Line, Sunset Drive, and Wellington Road, the estimated costs are $1,800,000.

In summary, capital improvements within St. Thomas's jurisdiction are estimated to range in cost from $4,495,000 to $4,825,000 depending on the control type (stop control or roundabout) at the intersection of Sunset Drive and Major Line.

9.0 Summary

9.1 Area 1 Background

Dillon Consulting Limited has been retained by the City of St. Thomas to prepare a Transportation Technical Report which documents a transportation assessment for the Positioned for Growth Study. Initially a high-level strategic assessment of four potential expansion areas was conducted.

It was determined that an additional 76 gross hectares of residential land was deemed necessary to accommodate future population growth in St. Thomas. Four expansion areas located along the west limits of the City of St. Thomas were identified and strategically evaluated as potential areas to support this forecasted growth.

As a result of that strategic evaluation, Area 1 was selected as the preferred expansion area. Area 1 is 63 hectares in size and is proposed to house up to 1,387 residential units. It is anticipated that Area 1 will be fully built out by 2039.

The proposed Area 1 development is anticipated to generate 945 vehicle trips during the weekday AM peak hour and 1,210 vehicle trips during the weekday PM peak hour.

9.2 Potential Improvements

At the existing intersection of Sunset Drive and Major Line, a southbound left turn lane with 40 metres of storage on Sunset Drive, and an exclusive right turn lane with 45 metres of storage on Major Line are recommended. Based on forecast volumes and traffic patterns, a traffic signal will not be warranted at this intersection. However, a single lane roundabout would also be an appropriate form of traffic control at this intersection.

At the existing roundabout consisting of Sunset Drive, Wellington Road, and Talbot Street, an additional northbound and southbound approach lane could be considered to reduce vehicle delays and queues, if desired. These additional lanes should extend a minimum 100 metres north and south of the roundabout.

At the proposed four-legged intersection along Major Line, left turn lanes are recommended in all four directions. A traffic signal at this intersection is not warranted, however, a roundabout should be considered within the next stages of development.

At the proposed three-legged intersection along Sunset Drive, a southeast bound left turn lane, a northwest bound right turn lane and separate southwest bound right turn and left turn lanes are recommended. This intersection does not meet the technical warrant for a traffic signal at a proposed

intersection. However, once Area 1 is built out, it is likely that a traffic signal will be warranted given that the signal warrant methodology within OTM Book 12 requires lower thresholds be met for an existing intersection compared to a proposed intersection. As a result, the introduction of a future traffic signal at the proposed Area 1 site access to Sunset should be anticipated from a cost estimate standpoint.

At the proposed three-legged intersection along Wellington Road, a northbound left turn lane, a southbound right turn lane and separate eastbound right turn and left turn lanes are recommended. This intersection does not meet the technical warrant for a traffic signal at a proposed intersection. However, once Area 1 is built out, it is likely that a traffic signal will be warranted given that the signal warrant methodology within OTM Book 12 requires lower thresholds be met for an existing intersection compared to a proposed intersection. As a result, the introduction of a future traffic signal at the proposed Area 1 site access to Wellington Road should be anticipated from a cost estimate standpoint. However, a roundabout should also be considered within the next stages of development.

A transit route should be planned to connect and potentially travel through Area 1, which would need to extend along Talbot Street and connect to the Central Transfer Point. Some rationalization of Route 3 and Route 5a may need to occur due to the duplication of these transit routes along or near Talbot Street east and west through downtown St. Thomas.

Active transportation infrastructure should be planned along the internal roadways of the development and should connect to infrastructure proposed along Major Line, Sunset Drive and Wellington Road.

Appendix A

Area 1 Site – Development Area

City of St Thomas Settlement Expansion

Potential Settlement Expansion Areas

Area 1



LEGEND

- Potential Settlement Area 1
- Property Limits
- Municipal Boundary

DILLON CONSULTING

ST. THOMAS
THE RAILWAY CITY

N

250 0 250 500 750

Metres
Last Revised March 13, 2019
Air Photography 2015
City of St Thomas Planning & Building Services

Appendix B

Turning Movement Count Data

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019
Page No : 1

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Sunset Dr From North					Major Line From East					Sunset Dr From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	43	0	0	43	0	0	0	0	0	1	77	0	0	78	0	1	0	0	1	122
07:15 AM	0	65	2	0	67	0	0	0	0	0	0	106	0	0	106	0	0	0	0	0	173
07:30 AM	0	93	3	0	96	1	0	2	0	3	0	98	0	0	98	0	0	0	0	0	197
07:45 AM	0	112	3	0	115	0	0	1	0	1	0	110	1	0	111	0	0	0	0	0	227
Total	0	313	8	0	321	1	0	3	0	4	1	391	1	0	393	0	1	0	0	1	719
08:00 AM	0	98	1	0	99	3	0	0	0	3	0	73	0	0	73	0	0	0	0	0	175
08:15 AM	0	105	0	0	105	2	0	0	0	2	0	82	0	0	82	0	0	0	0	0	189
08:30 AM	0	90	1	0	91	1	0	1	0	2	1	58	0	0	59	1	0	0	0	1	153
08:45 AM	0	80	2	0	82	1	0	0	0	1	0	56	1	0	57	1	0	0	0	1	141
Total	0	373	4	0	377	7	0	1	0	8	1	269	1	0	271	2	0	0	0	2	658
09:00 AM	0	67	5	0	72	3	0	2	0	5	1	61	0	1	63	1	0	0	1	2	142
09:15 AM	0	62	1	0	63	1	0	0	0	1	0	50	0	0	50	0	0	0	0	0	114
09:30 AM	0	56	1	0	57	1	0	0	0	1	0	59	0	0	59	0	0	0	0	0	117
09:45 AM	0	53	3	0	56	1	1	0	0	2	2	49	0	0	51	1	0	0	0	1	110
Total	0	238	10	0	248	6	1	2	0	9	3	219	0	1	223	2	0	0	1	3	483
03:00 PM	0	67	1	0	68	2	0	2	0	4	0	80	0	0	80	1	0	0	0	1	153
03:15 PM	0	75	0	0	75	3	0	1	0	4	0	90	0	0	90	0	0	0	0	0	169
03:30 PM	0	85	3	0	88	1	0	2	0	3	1	83	0	0	84	0	0	0	0	0	175
03:45 PM	0	82	1	0	83	2	0	0	0	2	2	93	1	0	96	0	0	0	0	0	181
Total	0	309	5	0	314	8	0	5	0	13	3	346	1	0	350	1	0	0	0	1	678
04:00 PM	0	87	1	0	88	4	0	1	0	5	2	113	2	0	117	1	0	0	0	1	211
04:15 PM	0	113	2	0	115	2	1	0	0	3	4	99	0	0	103	1	0	1	0	2	223
04:30 PM	0	123	3	0	126	3	0	0	0	3	1	102	1	0	104	1	0	0	0	1	234
04:45 PM	0	102	2	0	104	5	0	2	0	7	0	93	0	0	93	0	1	0	0	1	205
Total	0	425	8	0	433	14	1	3	0	18	7	407	3	0	417	3	1	1	0	5	873
05:00 PM	0	116	3	0	119	2	0	0	0	2	1	104	0	0	105	2	0	1	0	3	229
05:15 PM	0	96	1	0	97	0	0	2	0	2	0	80	0	0	80	1	0	0	0	1	180
05:30 PM	0	93	4	0	97	1	0	0	0	1	0	106	0	0	106	0	0	0	0	0	204
05:45 PM	0	69	2	0	71	3	0	1	0	4	0	72	0	0	72	0	0	0	0	0	147
Total	0	374	10	0	384	6	0	3	0	9	1	362	0	0	363	3	0	1	0	4	760

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

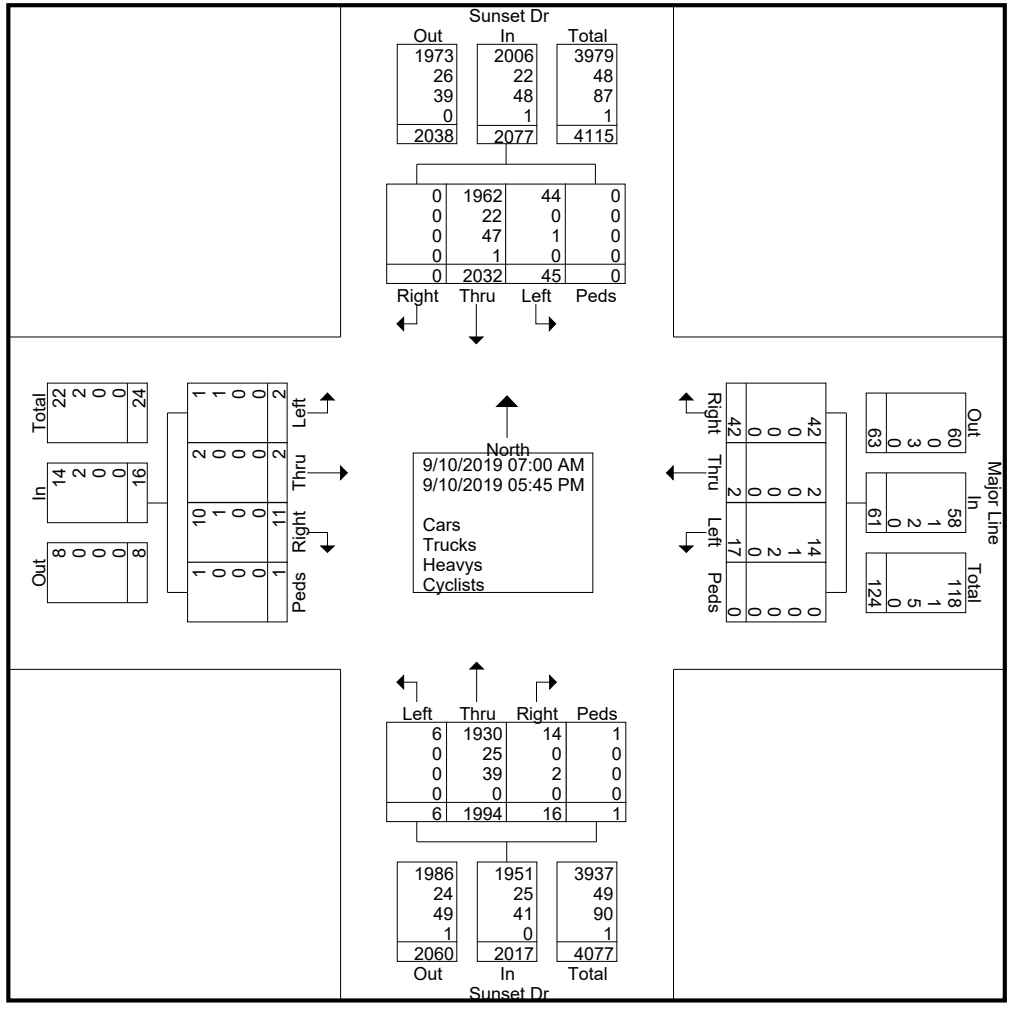
	Sunset Dr From North					Major Line From East					Sunset Dr From South					From West					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Grand Total	0	2032	45	0	2077	42	2	17	0	61	16	1994	6	1	2017	11	2	2	1	16	4171
Apprch %	0	97.8	2.2	0		68.9	3.3	27.9	0		0.8	98.9	0.3	0		68.8	12.5	12.5	6.2		
Total %	0	48.7	1.1	0	49.8	1	0	0.4	0	1.5	0.4	47.8	0.1	0	48.4	0.3	0	0	0	0.4	
Cars	0	1962	44	0	2006	42	2	14	0	58	14	1930	6	1	1951	10	2	1	1	14	4029
% Cars	0	96.6	97.8	0	96.6	100	100	82.4	0	95.1	87.5	96.8	100	100	96.7	90.9	100	50	100	87.5	96.6
Trucks	0	22	0	0	22	0	0	1	0	1	0	25	0	0	25	1	0	1	0	2	50
% Trucks	0	1.1	0	0	1.1	0	0	5.9	0	1.6	0	1.3	0	0	1.2	9.1	0	50	0	12.5	1.2
Heavys	0	47	1	0	48	0	0	2	0	2	2	39	0	0	41	0	0	0	0	0	91
% Heavys	0	2.3	2.2	0	2.3	0	0	11.8	0	3.3	12.5	2	0	0	2	0	0	0	0	0	2.2
Cyclists	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019
Page No : 3



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019

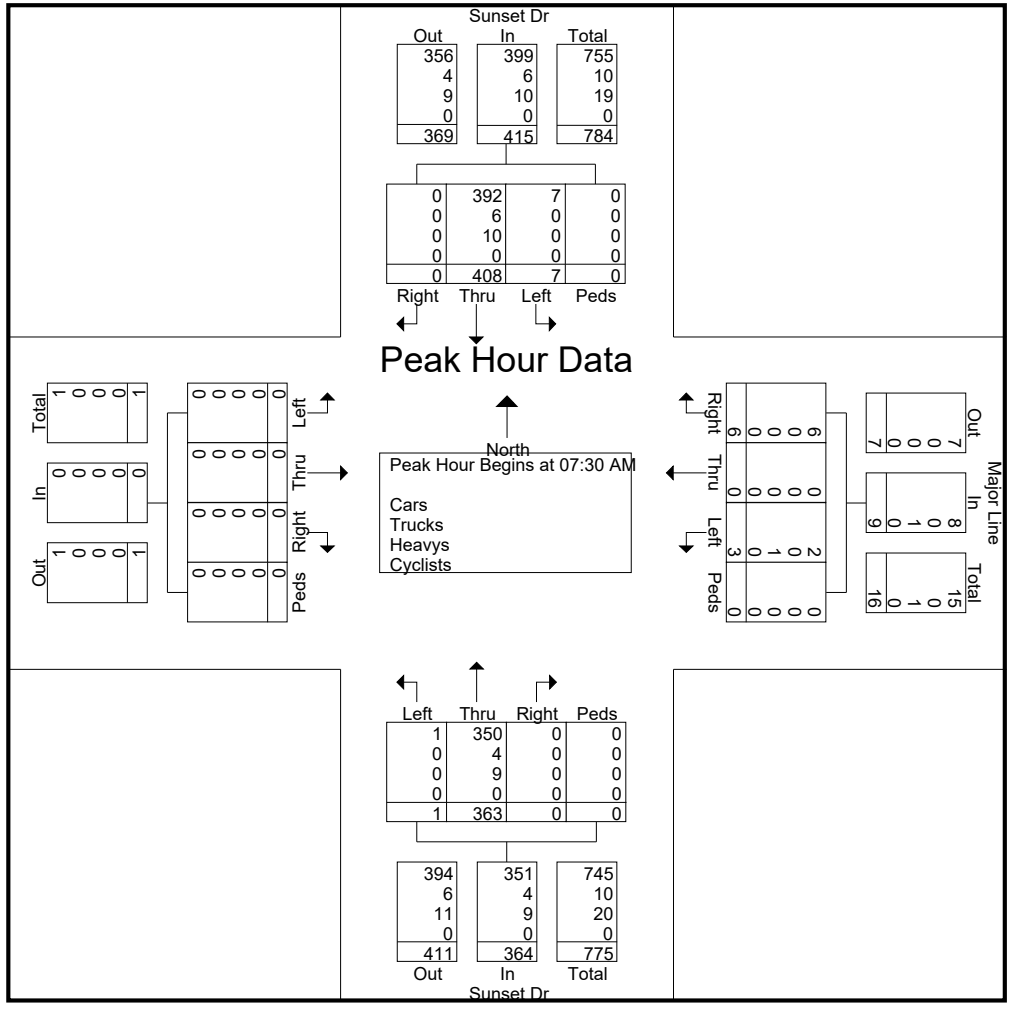
	Sunset Dr From North					Major Line From East					Sunset Dr From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	93	**3**	0	96	1	0	**2**	0	**3**	0	98	0	0	98	0	0	0	0	0	197
07:45 AM	0	**112**	3	0	**115**	0	0	1	0	1	0	**110**	**1**	0	**111**	0	0	0	0	0	**227**
08:00 AM	0	98	1	0	99	**3**	0	0	0	3	0	73	0	0	73	0	0	0	0	0	175
08:15 AM	0	105	0	0	105	2	0	0	0	2	0	82	0	0	82	0	0	0	0	0	189
Total Volume	0	408	7	0	415	6	0	3	0	9	0	363	1	0	364	0	0	0	0	0	788
% App. Total	0	98.3	1.7	0		66.7	0	33.3	0		0	99.7	0.3	0		0	0	0	0		
PHF	.000	.911	.583	.000	.902	.500	.000	.375	.000	.750	.000	.825	.250	.000	.820	.000	.000	.000	.000	.000	.868
Cars	0	392	7	0	399	6	0	2	0	8	0	350	1	0	351	0	0	0	0	0	758
% Cars	0	96.1	100	0	96.1	100	0	66.7	0	88.9	0	96.4	100	0	96.4	0	0	0	0	0	96.2
Trucks	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	10
% Trucks	0	1.5	0	0	1.4	0	0	0	0	0	0	1.1	0	0	1.1	0	0	0	0	0	1.3
Heavys	0	10	0	0	10	0	0	1	0	1	0	9	0	0	9	0	0	0	0	0	20
% Heavys	0	2.5	0	0	2.4	0	0	33.3	0	11.1	0	2.5	0	0	2.5	0	0	0	0	0	2.5
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019
Page No : 5

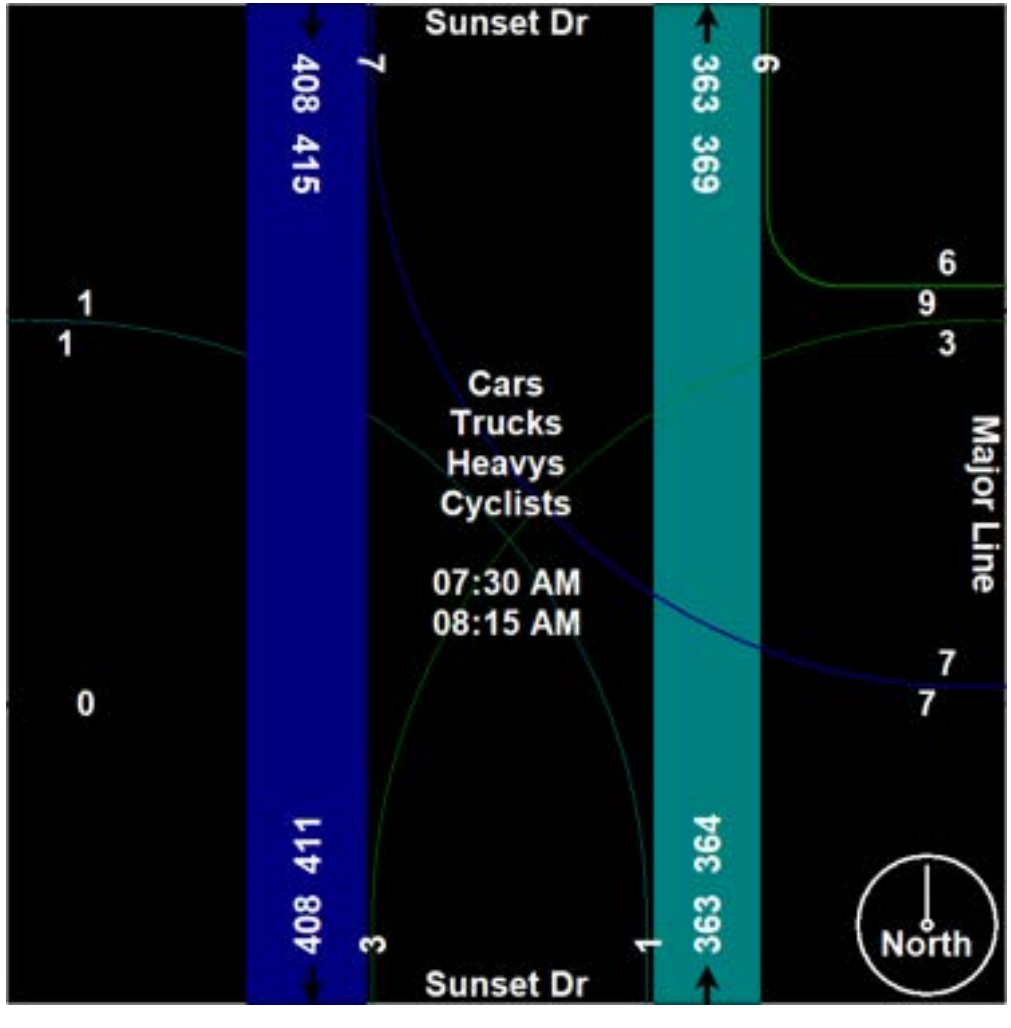


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019
Page No : 6



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019

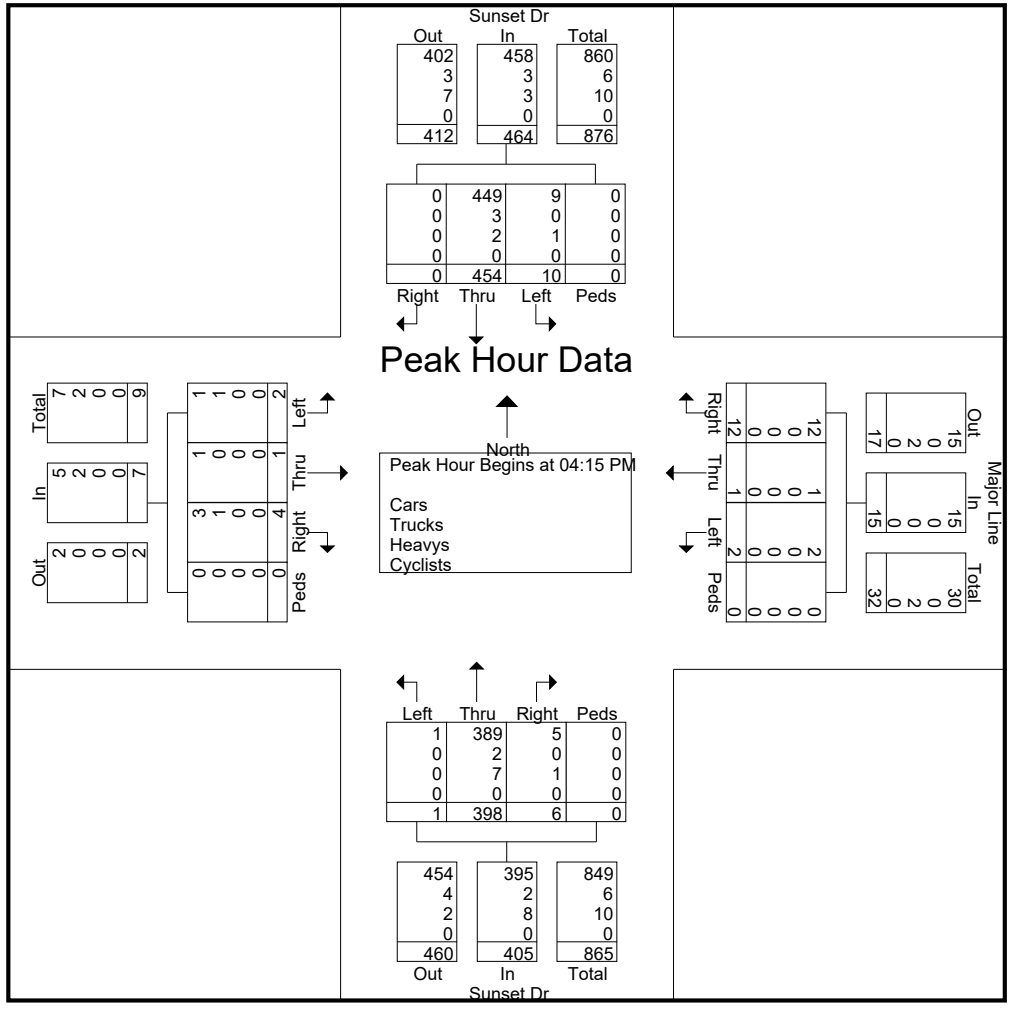
	Sunset Dr From North					Major Line From East					Sunset Dr From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	113	2	0	115	2	**1**	0	0	3	**4**	99	0	0	103	1	0	**1**	0	2	223
04:30 PM	0	**123**	**3**	0	**126**	3	0	0	0	3	1	102	**1**	0	104	1	0	0	0	1	**234**
04:45 PM	0	102	2	0	104	**5**	0	**2**	0	**7**	0	93	0	0	93	0	**1**	0	0	1	205
05:00 PM	0	116	3	0	119	2	0	0	0	2	1	**104**	0	0	**105**	**2**	0	1	0	**3**	229
Total Volume	0	454	10	0	464	12	1	2	0	15	6	398	1	0	405	4	1	2	0	7	891
% App. Total	0	97.8	2.2	0		80	6.7	13.3	0		1.5	98.3	0.2	0		57.1	14.3	28.6	0		
PHF	.000	.923	.833	.000	.921	.600	.250	.250	.000	.536	.375	.957	.250	.000	.964	.500	.250	.500	.000	.583	.952
Cars	0	449	9	0	458	12	1	2	0	15	5	389	1	0	395	3	1	1	0	5	873
% Cars	0	98.9	90.0	0	98.7	100	100	100	0	100	83.3	97.7	100	0	97.5	75.0	100	50.0	0	71.4	98.0
Trucks	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	7
% Trucks	0	0.7	0	0	0.6	0	0	0	0	0	0	0.5	0	0	0.5	25.0	0	50.0	0	28.6	0.8
Heavys	0	2	1	0	3	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	11
% Heavys	0	0.4	10.0	0	0.6	0	0	0	0	0	16.7	1.8	0	0	2.0	0	0	0	0	0	1.2
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019
Page No : 8

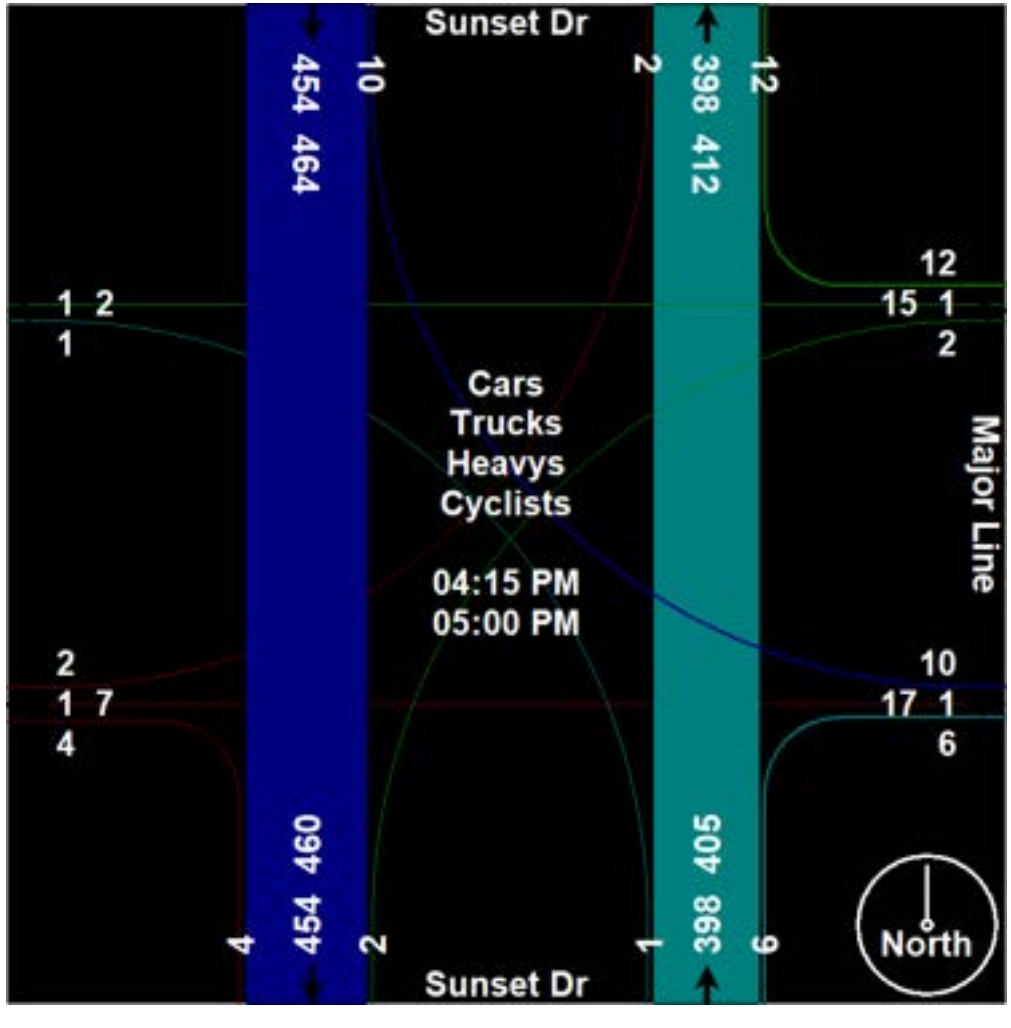


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Major Line at Sunset Dr
Site Code : 00000000
Start Date : 9/10/2019
Page No : 9



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019
Page No : 1

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Ford Rd From North					Major Line From East					Ford Rd From South					Major Line From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	7	0	0	7	3	0	1	0	4	0	11	2	0	13	0	1	0	0	1	25
07:15 AM	1	6	0	0	7	4	0	2	1	7	0	9	6	0	15	1	0	0	0	1	30
07:30 AM	0	7	0	0	7	1	0	2	0	3	2	16	0	0	18	5	2	1	0	8	36
07:45 AM	0	8	1	0	9	1	1	7	0	9	4	14	1	6	25	3	1	1	0	5	48
Total	1	28	1	0	30	9	1	12	1	23	6	50	9	6	71	9	4	2	0	15	139
08:00 AM	3	13	0	0	16	1	0	6	0	7	1	12	1	1	15	2	0	1	0	3	41
08:15 AM	0	6	0	0	6	2	1	4	0	7	3	9	0	0	12	5	0	0	0	5	30
08:30 AM	1	13	1	0	15	0	1	7	0	8	3	15	1	0	19	3	1	2	0	6	48
08:45 AM	1	9	2	0	12	0	0	4	0	4	1	5	0	0	6	1	1	2	0	4	26
Total	5	41	3	0	49	3	2	21	0	26	8	41	2	1	52	11	2	5	0	18	145
09:00 AM	0	4	0	0	4	1	2	2	0	5	3	11	1	0	15	1	2	0	0	3	27
09:15 AM	0	8	1	0	9	0	2	5	0	7	2	8	0	0	10	1	1	0	0	2	28
09:30 AM	0	6	0	0	6	3	0	4	0	7	1	6	3	0	10	1	1	0	0	2	25
09:45 AM	0	8	0	0	8	2	2	3	0	7	4	10	0	0	14	1	0	0	0	1	30
Total	0	26	1	0	27	6	6	14	0	26	10	35	4	0	49	4	4	0	0	8	110
03:00 PM	1	9	0	0	10	0	2	2	0	4	6	5	2	0	13	4	0	0	0	4	31
03:15 PM	0	14	1	0	15	1	2	4	0	7	2	15	2	0	19	1	0	0	0	1	42
03:30 PM	0	24	0	0	24	1	0	0	0	1	3	6	3	0	12	4	1	0	0	5	42
03:45 PM	2	19	0	0	21	0	3	1	0	4	5	7	0	0	12	0	1	0	0	1	38
Total	3	66	1	0	70	2	7	7	0	16	16	33	7	0	56	9	2	0	0	11	153
04:00 PM	0	7	1	0	8	0	2	0	0	2	6	10	3	0	19	5	1	0	0	6	35
04:15 PM	1	15	2	0	18	1	0	3	0	4	6	13	3	0	22	3	3	0	0	6	50
04:30 PM	2	17	3	0	22	0	1	5	0	6	5	9	3	0	17	4	2	0	0	6	51
04:45 PM	1	21	3	0	25	0	3	2	0	5	4	7	4	0	15	2	0	0	0	2	47
Total	4	60	9	0	73	1	6	10	0	17	21	39	13	0	73	14	6	0	0	20	183
05:00 PM	0	22	3	0	25	1	1	2	0	4	4	8	2	0	14	2	1	0	1	4	47
05:15 PM	0	19	2	1	22	1	0	6	1	8	7	7	3	0	17	3	1	0	0	4	51
05:30 PM	0	22	0	0	22	0	1	5	0	6	5	7	3	0	15	2	1	0	0	3	46
05:45 PM	0	23	2	0	25	1	0	4	0	5	4	4	6	0	14	0	1	0	0	1	45
Total	0	86	7	1	94	3	2	17	1	23	20	26	14	0	60	7	4	0	1	12	189

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

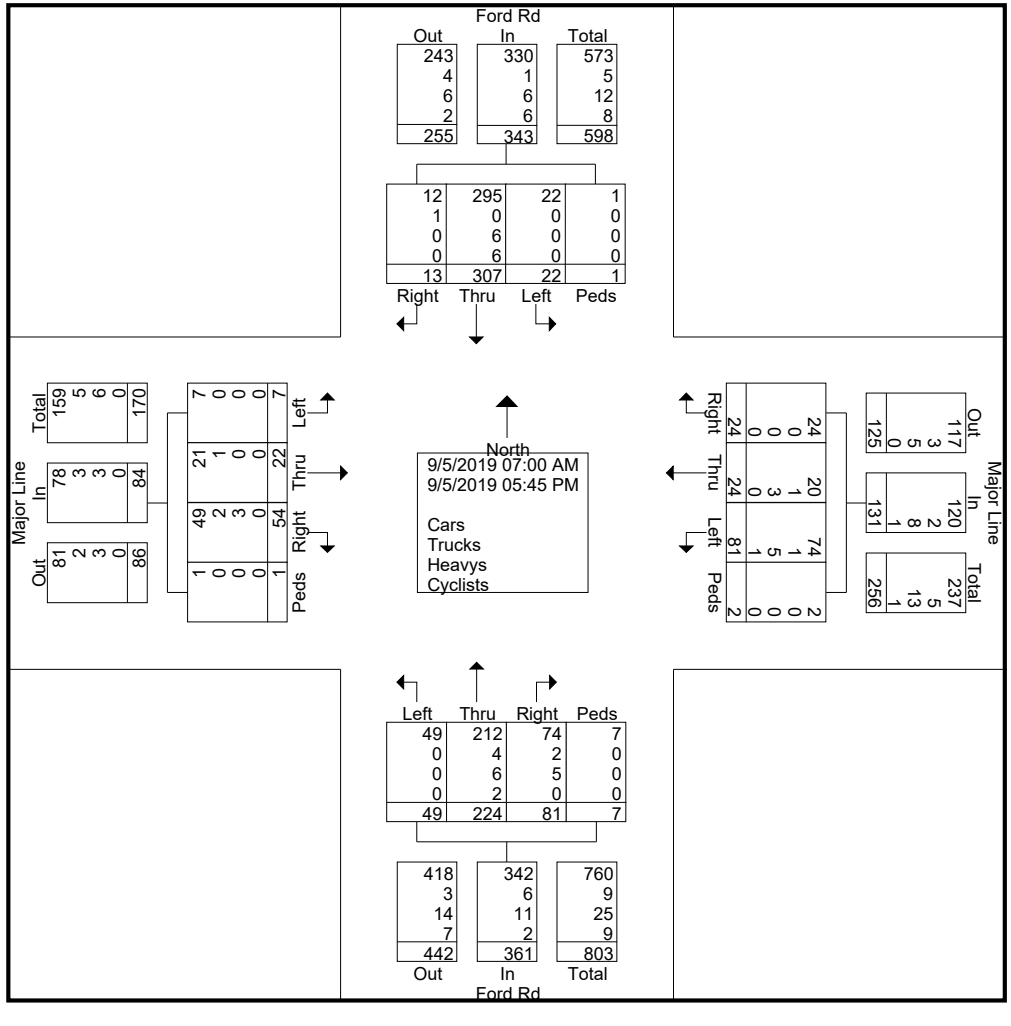
	Ford Rd From North					Major Line From East					Ford Rd From South					Major Line From West					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Grand Total	13	307	22	1	343	24	24	81	2	131	81	224	49	7	361	54	22	7	1	84	919
Apprch %	3.8	89.5	6.4	0.3		18.3	18.3	61.8	1.5		22.4	62	13.6	1.9		64.3	26.2	8.3	1.2		
Total %	1.4	33.4	2.4	0.1	37.3	2.6	2.6	8.8	0.2	14.3	8.8	24.4	5.3	0.8	39.3	5.9	2.4	0.8	0.1	9.1	
Cars	12	295	22	1	330	24	20	74	2	120	74	212	49	7	342	49	21	7	1	78	870
% Cars	92.3	96.1	100	100	96.2	100	83.3	91.4	100	91.6	91.4	94.6	100	100	94.7	90.7	95.5	100	100	92.9	94.7
Trucks	1	0	0	0	1	0	1	1	0	2	2	4	0	0	6	2	1	0	0	3	12
% Trucks	7.7	0	0	0	0.3	0	4.2	1.2	0	1.5	2.5	1.8	0	0	1.7	3.7	4.5	0	0	3.6	1.3
Heavys	0	6	0	0	6	0	3	5	0	8	5	6	0	0	11	3	0	0	0	3	28
% Heavys	0	2	0	0	1.7	0	12.5	6.2	0	6.1	6.2	2.7	0	0	3	5.6	0	0	0	3.6	3
Cyclists	0	6	0	0	6	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	9
% Cyclists	0	2	0	0	1.7	0	0	1.2	0	0.8	0	0.9	0	0	0.6	0	0	0	0	0	1

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019
Page No : 3



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019

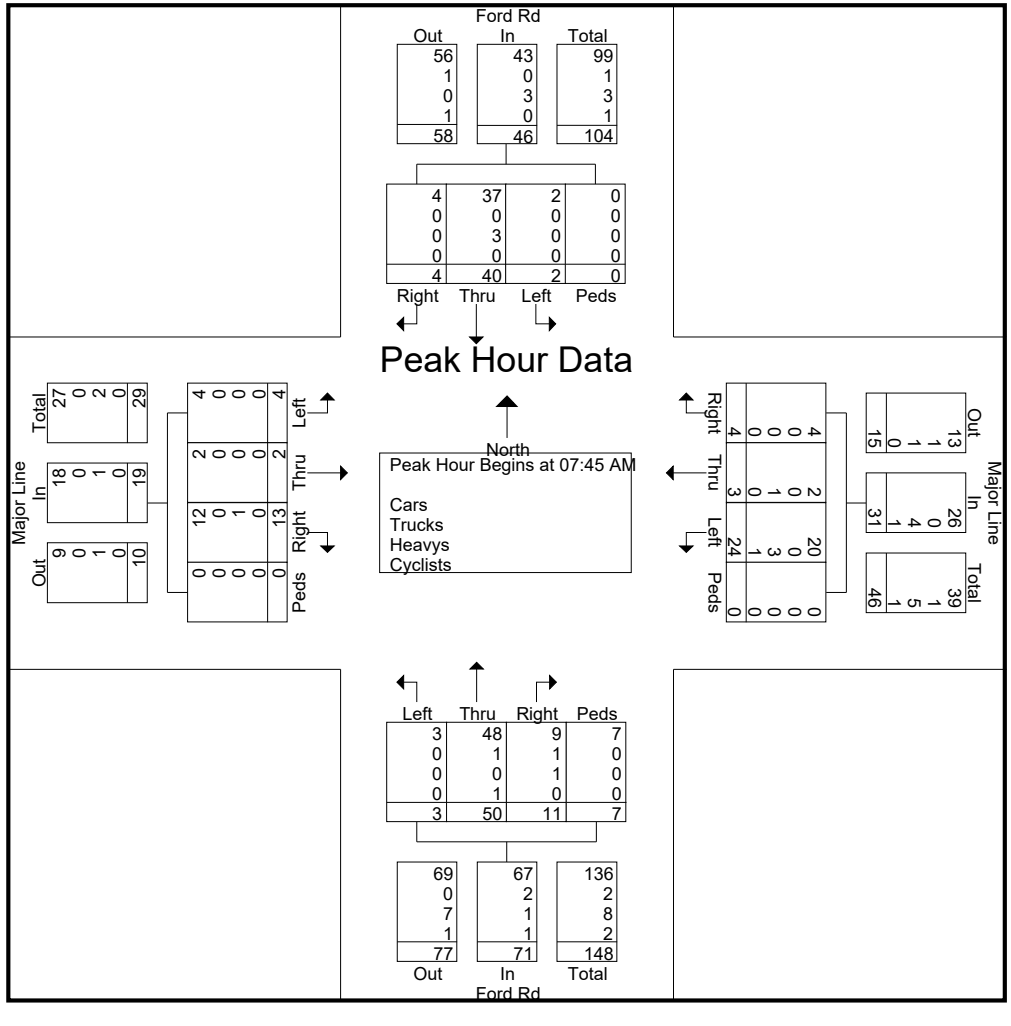
	Ford Rd From North					Major Line From East					Ford Rd From South					Major Line From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	8	**1**	0	9	1	**1**	**7**	0	**9**	**4**	14	**1**	**6**	**25**	3	**1**	1	0	5	**48**
08:00 AM	**3**	**13**	0	0	**16**	1	0	6	0	7	1	12	1	1	15	2	0	1	0	3	41
08:15 AM	0	6	0	0	6	**2**	1	4	0	7	3	9	0	0	12	**5**	0	0	0	5	30
08:30 AM	1	13	1	0	15	0	1	7	0	8	3	**15**	1	0	19	3	1	**2**	0	**6**	48
Total Volume	4	40	2	0	46	4	3	24	0	31	11	50	3	7	71	13	2	4	0	19	167
% App. Total	8.7	87	4.3	0		12.9	9.7	77.4	0		15.5	70.4	4.2	9.9		68.4	10.5	21.1	0		
PHF	.333	.769	.500	.000	.719	.500	.750	.857	.000	.861	.688	.833	.750	.292	.710	.650	.500	.500	.000	.792	.870
Cars	4	37	2	0	43	4	2	20	0	26	9	48	3	7	67	12	2	4	0	18	154
% Cars	100	92.5	100	0	93.5	100	66.7	83.3	0	83.9	81.8	96.0	100	100	94.4	92.3	100	100	0	94.7	92.2
Trucks	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
% Trucks	0	0	0	0	0	0	0	0	0	0	9.1	2.0	0	0	2.8	0	0	0	0	0	1.2
Heavys	0	3	0	0	3	0	1	3	0	4	1	0	0	0	1	1	0	0	0	1	9
% Heavys	0	7.5	0	0	6.5	0	33.3	12.5	0	12.9	9.1	0	0	0	1.4	7.7	0	0	0	5.3	5.4
Cyclists	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
% Cyclists	0	0	0	0	0	0	0	4.2	0	3.2	0	2.0	0	0	1.4	0	0	0	0	0	1.2

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019
Page No : 5

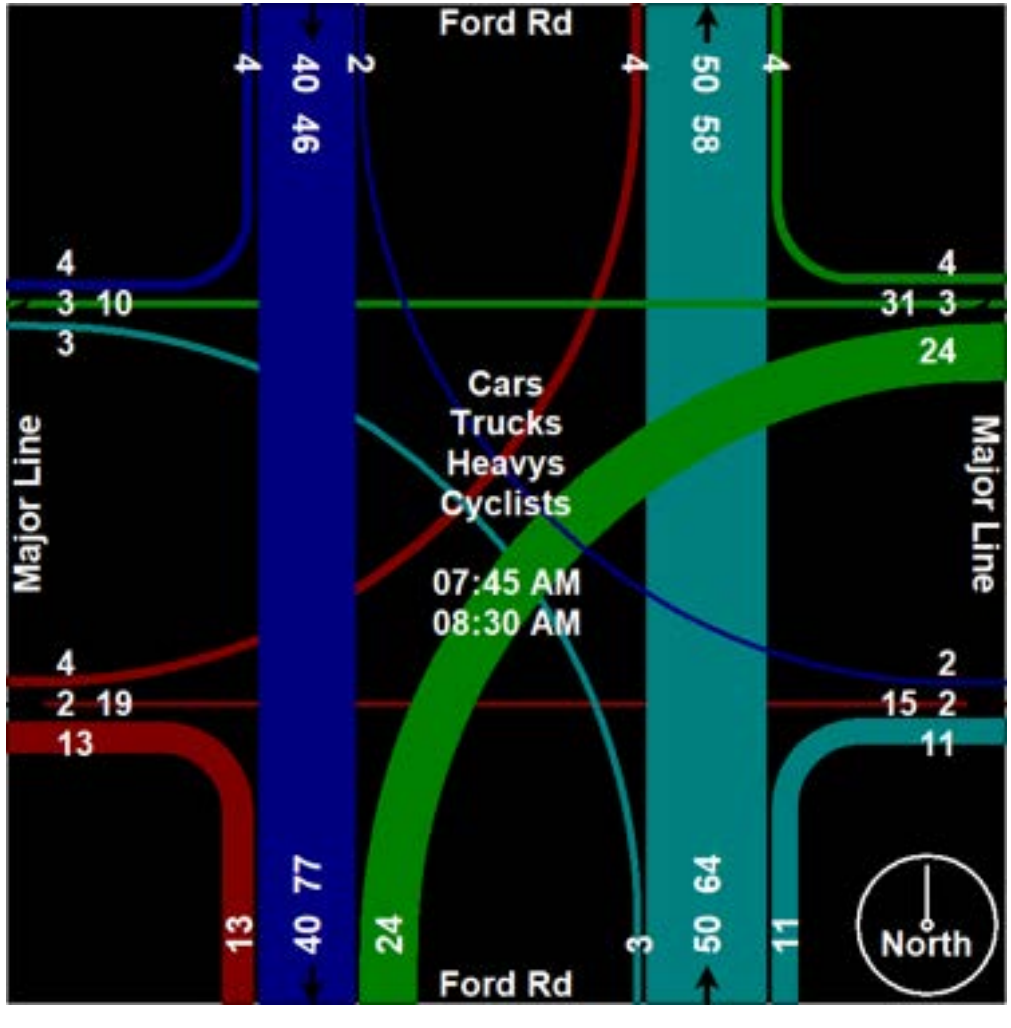


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019
Page No : 6



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019

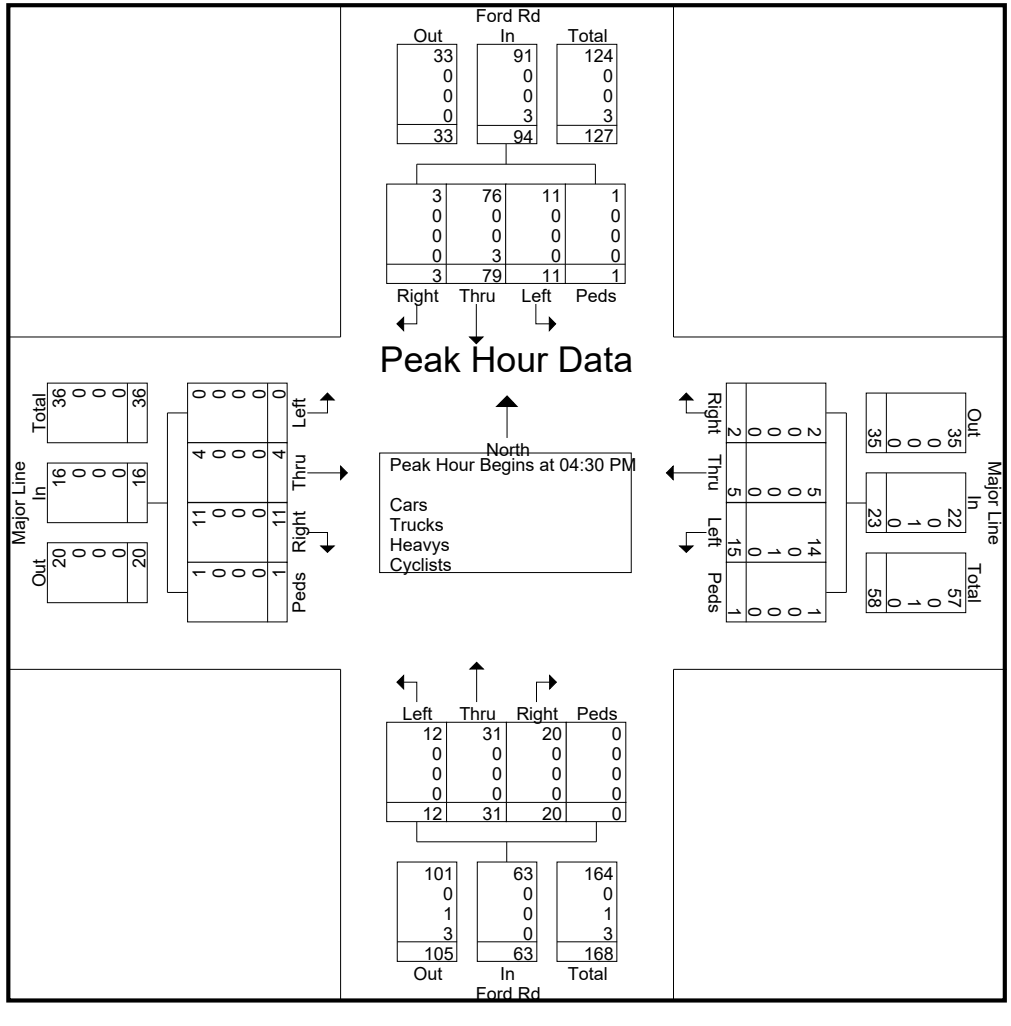
	Ford Rd From North					Major Line From East					Ford Rd From South					Major Line From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**2**	17	**3**	0	22	0	1	5	0	6	5	**9**	3	0	**17**	**4**	**2**	0	0	**6**	**51**
04:45 PM	1	21	3	0	**25**	0	**3**	2	0	5	4	7	**4**	0	15	2	0	0	0	2	47
05:00 PM	0	**22**	3	0	25	**1**	1	2	0	4	4	8	2	0	14	2	1	0	**1**	4	47
05:15 PM	0	19	2	**1**	22	1	0	**6**	**1**	**8**	**7**	7	3	0	17	3	1	0	0	4	51
Total Volume	3	79	11	1	94	2	5	15	1	23	20	31	12	0	63	11	4	0	1	16	196
% App. Total	3.2	84	11.7	1.1		8.7	21.7	65.2	4.3		31.7	49.2	19	0		68.8	25	0	6.2		
PHF	.375	.898	.917	.250	.940	.500	.417	.625	.250	.719	.714	.861	.750	.000	.926	.688	.500	.000	.250	.667	.961
Cars	3	76	11	1	91	2	5	14	1	22	20	31	12	0	63	11	4	0	1	16	192
% Cars	100	96.2	100	100	96.8	100	100	93.3	100	95.7	100	100	100	0	100	100	100	0	100	100	98.0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heavys	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Heavys	0	0	0	0	0	0	0	6.7	0	4.3	0	0	0	0	0	0	0	0	0	0	0.5
Cyclists	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Cyclists	0	3.8	0	0	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019
Page No : 8

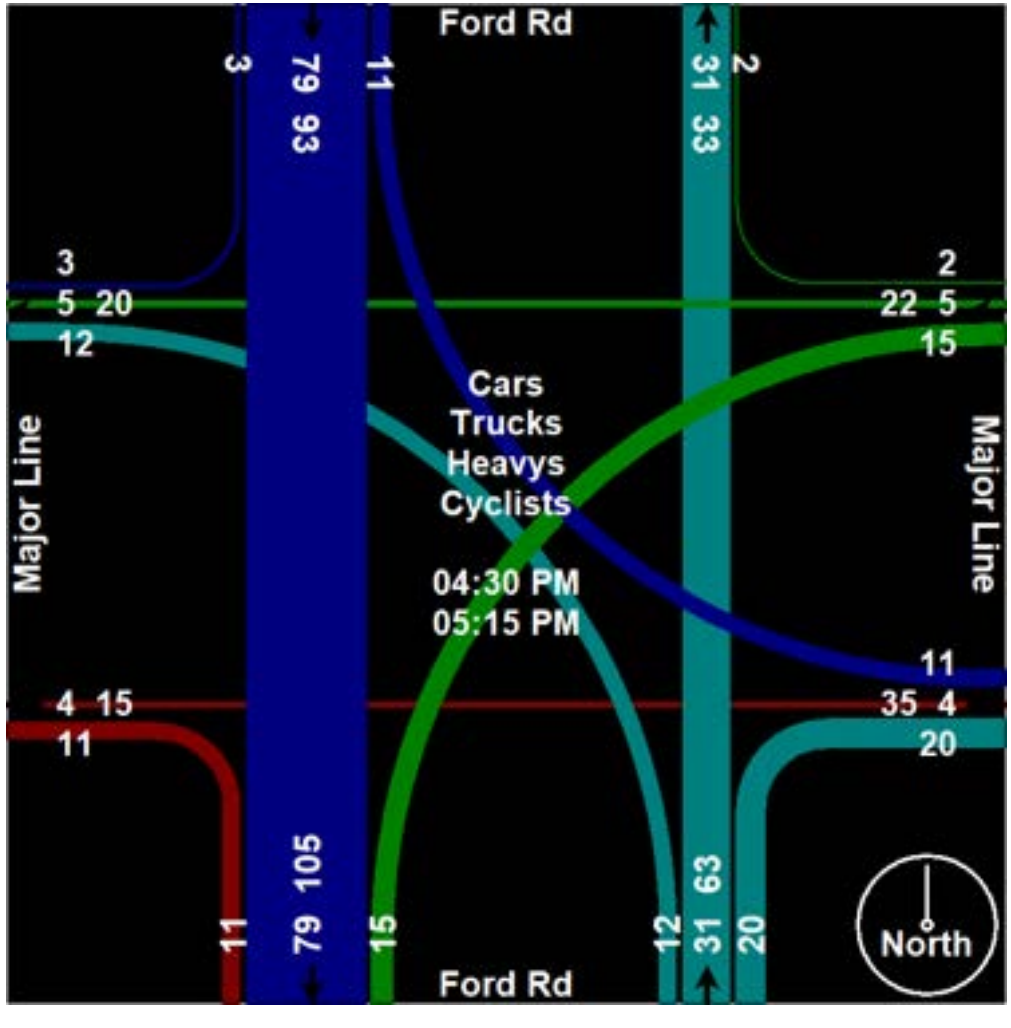


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Major Line
Site Code : 00000000
Start Date : 9/5/2019
Page No : 9



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Wellington Rd From North					From East					Wellington Rd From South					Ford Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	3	30	0	0	33	0	0	0	0	0	0	95	10	0	105	7	0	1	0	8	146
07:15 AM	6	38	0	0	44	0	0	0	0	0	0	109	11	0	120	10	0	1	0	11	175
07:30 AM	3	55	0	0	58	0	0	0	0	0	0	143	21	0	164	10	0	2	0	12	234
07:45 AM	1	79	0	0	80	0	0	0	0	0	0	102	13	0	115	16	0	2	0	18	213
Total	13	202	0	0	215	0	0	0	0	0	0	449	55	0	504	43	0	6	0	49	768
08:00 AM	0	51	0	0	51	1	0	0	0	1	0	92	15	0	107	18	0	2	0	20	179
08:15 AM	1	54	0	1	56	0	0	1	0	1	0	104	13	0	117	12	0	3	0	15	189
08:30 AM	1	57	0	0	58	0	0	0	0	0	1	78	13	0	92	18	0	2	0	20	170
08:45 AM	1	54	0	0	55	0	0	0	0	0	0	62	11	0	73	13	0	1	0	14	142
Total	3	216	0	1	220	1	0	1	0	2	1	336	52	0	389	61	0	8	0	69	680
09:00 AM	0	62	1	2	65	0	0	0	0	0	0	69	11	0	80	4	0	2	0	6	151
09:15 AM	1	51	0	0	52	0	0	0	0	0	0	74	12	0	86	15	0	1	0	16	154
09:30 AM	1	56	0	0	57	0	0	0	0	0	0	85	9	0	94	13	0	1	0	14	165
09:45 AM	4	37	0	0	41	0	0	0	0	0	0	78	12	0	90	8	0	1	0	9	140
Total	6	206	1	2	215	0	0	0	0	0	0	306	44	0	350	40	0	5	0	45	610
03:00 PM	2	77	0	0	79	0	0	0	0	0	0	77	16	0	93	15	0	2	0	17	189
03:15 PM	2	73	0	0	75	0	0	0	0	0	0	80	15	0	95	15	0	2	0	17	187
03:30 PM	4	90	0	0	94	0	0	0	0	0	0	64	9	0	73	23	0	5	0	28	195
03:45 PM	1	84	0	0	85	0	0	1	0	1	0	82	10	0	92	22	0	1	0	23	201
Total	9	324	0	0	333	0	0	1	0	1	0	303	50	0	353	75	0	10	0	85	772
04:00 PM	5	95	0	0	100	0	0	0	0	0	0	94	22	0	116	11	0	2	0	13	229
04:15 PM	2	120	0	0	122	0	0	0	0	0	0	103	14	0	117	22	0	3	0	25	264
04:30 PM	3	99	0	0	102	1	0	0	0	1	0	96	19	0	115	23	0	5	0	28	246
04:45 PM	3	126	0	0	129	0	0	0	0	0	0	91	13	0	104	23	0	1	0	24	257
Total	13	440	0	0	453	1	0	0	0	1	0	384	68	0	452	79	0	11	0	90	996
05:00 PM	1	90	0	0	91	0	0	0	0	0	0	89	16	0	105	27	0	2	0	29	225
05:15 PM	1	135	0	0	136	0	0	0	0	0	0	81	15	0	96	30	0	1	0	31	263
05:30 PM	2	135	0	0	137	0	0	0	0	0	0	71	13	0	84	28	0	1	0	29	250
05:45 PM	3	101	0	0	104	0	0	0	0	0	0	66	10	0	76	23	0	2	0	25	205
Total	7	461	0	0	468	0	0	0	0	0	0	307	54	0	361	108	0	6	0	114	943

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

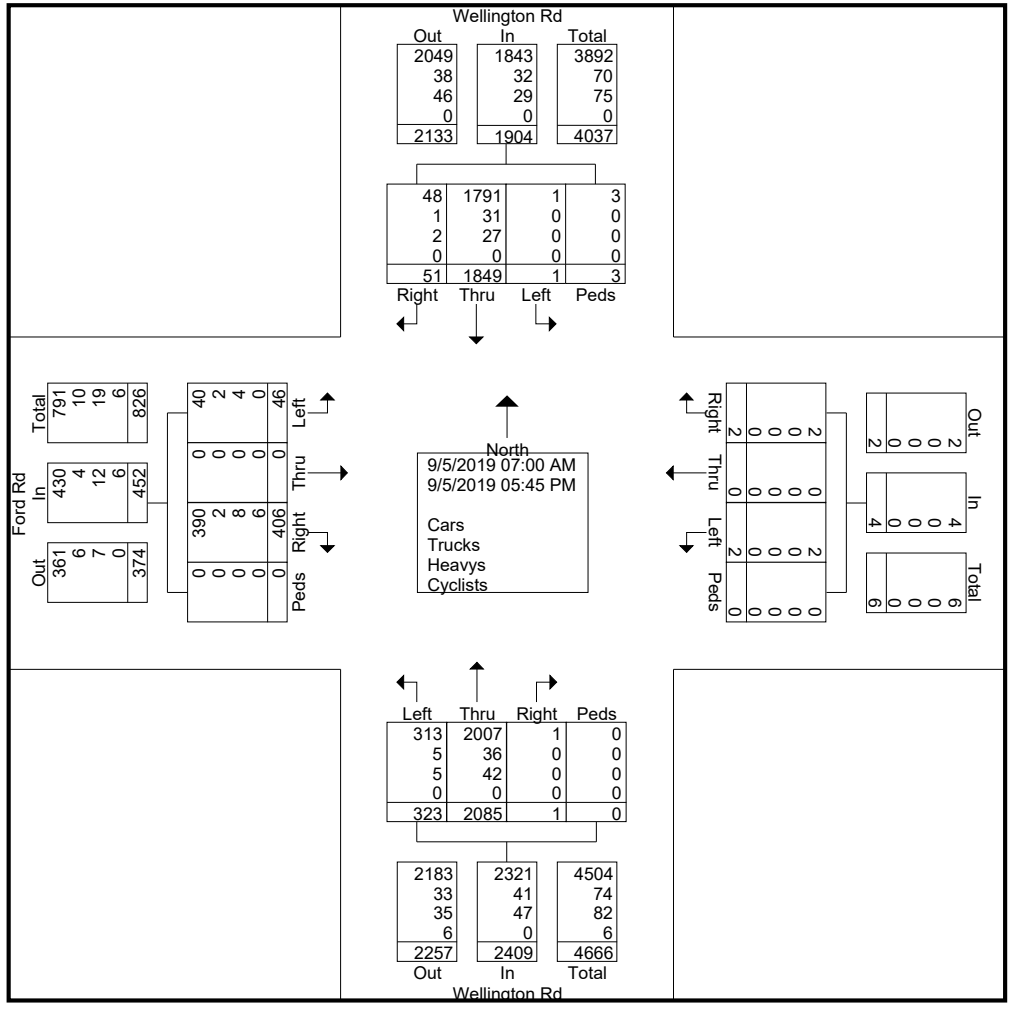
	Wellington Rd From North					From East					Wellington Rd From South					Ford Rd From West					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Grand Total	51	1849	1	3	1904	2	0	2	0	4	1	2085	323	0	2409	406	0	46	0	452	4769
Apprch %	2.7	97.1	0.1	0.2		50	0	50	0		0	86.6	13.4	0		89.8	0	10.2	0		
Total %	1.1	38.8	0	0.1	39.9	0	0	0	0	0.1	0	43.7	6.8	0	50.5	8.5	0	1	0	9.5	
Cars	48	1791	1	3	1843	2	0	2	0	4	1	2007	313	0	2321	390	0	40	0	430	4598
% Cars	94.1	96.9	100	100	96.8	100	0	100	0	100	100	96.3	96.9	0	96.3	96.1	0	87	0	95.1	96.4
Trucks	1	31	0	0	32	0	0	0	0	0	0	36	5	0	41	2	0	2	0	4	77
% Trucks	2	1.7	0	0	1.7	0	0	0	0	0	0	1.7	1.5	0	1.7	0.5	0	4.3	0	0.9	1.6
Heavys	2	27	0	0	29	0	0	0	0	0	0	42	5	0	47	8	0	4	0	12	88
% Heavys	3.9	1.5	0	0	1.5	0	0	0	0	0	0	2	1.5	0	2	2	0	8.7	0	2.7	1.8
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	6
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	0	0	1.3	0.1

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 3



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019

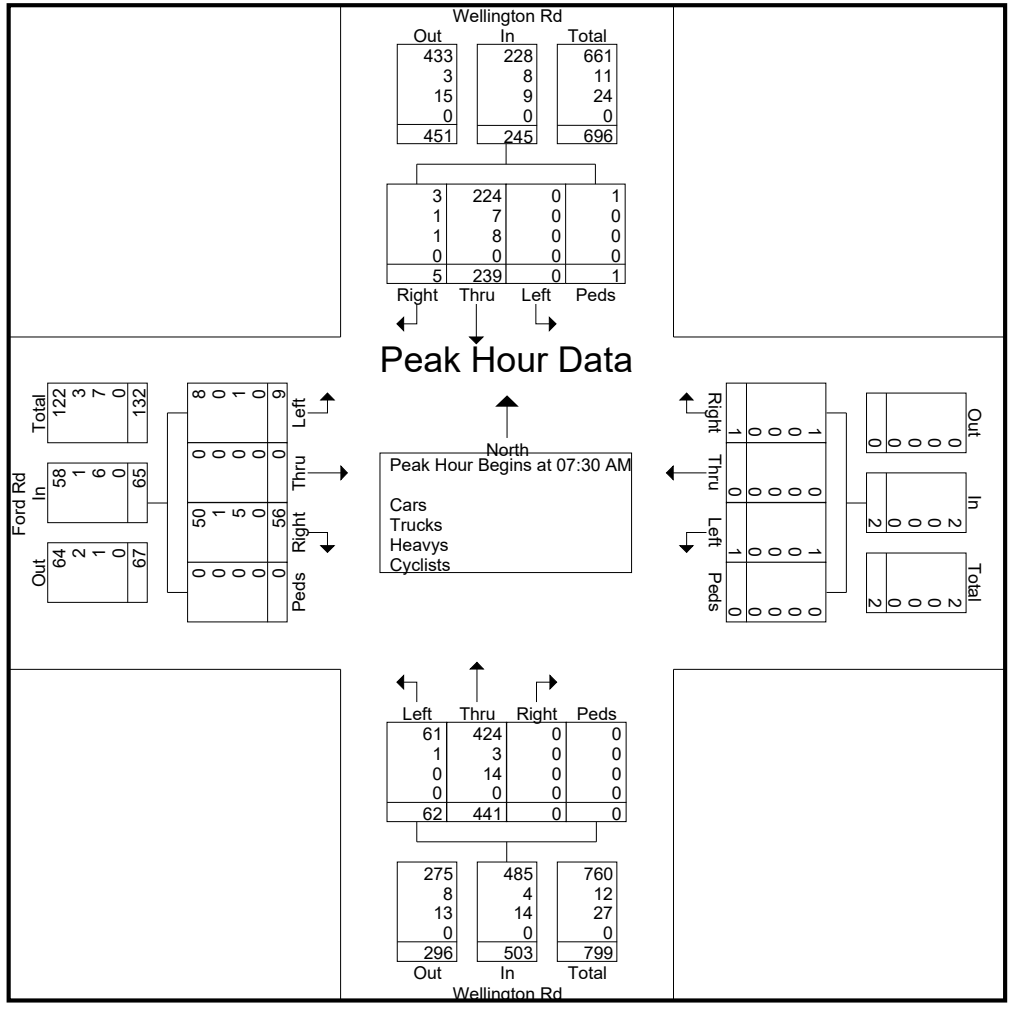
	Wellington Rd From North					From East					Wellington Rd From South					Ford Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**3**	55	0	0	58	0	0	0	0	0	0	**143**	**21**	0	**164**	10	0	2	0	12	**234**
07:45 AM	1	**79**	0	0	**80**	0	0	0	0	0	0	102	13	0	115	16	0	2	0	18	213
08:00 AM	0	51	0	0	51	**1**	0	0	0	**1**	0	92	15	0	107	**18**	0	2	0	**20**	179
08:15 AM	1	54	0	**1**	56	0	0	**1**	0	1	0	104	13	0	117	12	0	**3**	0	15	189
Total Volume	5	239	0	1	245	1	0	1	0	2	0	441	62	0	503	56	0	9	0	65	815
% App. Total	2	97.6	0	0.4		50	0	50	0		0	87.7	12.3	0		86.2	0	13.8	0		
PHF	.417	.756	.000	.250	.766	.250	.000	.250	.000	.500	.000	.771	.738	.000	.767	.778	.000	.750	.000	.813	.871
Cars	3	224	0	1	228	1	0	1	0	2	0	424	61	0	485	50	0	8	0	58	773
% Cars	60.0	93.7	0	100	93.1	100	0	100	0	100	0	96.1	98.4	0	96.4	89.3	0	88.9	0	89.2	94.8
Trucks	1	7	0	0	8	0	0	0	0	0	0	3	1	0	4	1	0	0	0	1	13
% Trucks	20.0	2.9	0	0	3.3	0	0	0	0	0	0	0.7	1.6	0	0.8	1.8	0	0	0	1.5	1.6
Heavys	1	8	0	0	9	0	0	0	0	0	0	14	0	0	14	5	0	1	0	6	29
% Heavys	20.0	3.3	0	0	3.7	0	0	0	0	0	0	3.2	0	0	2.8	8.9	0	11.1	0	9.2	3.6
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 5

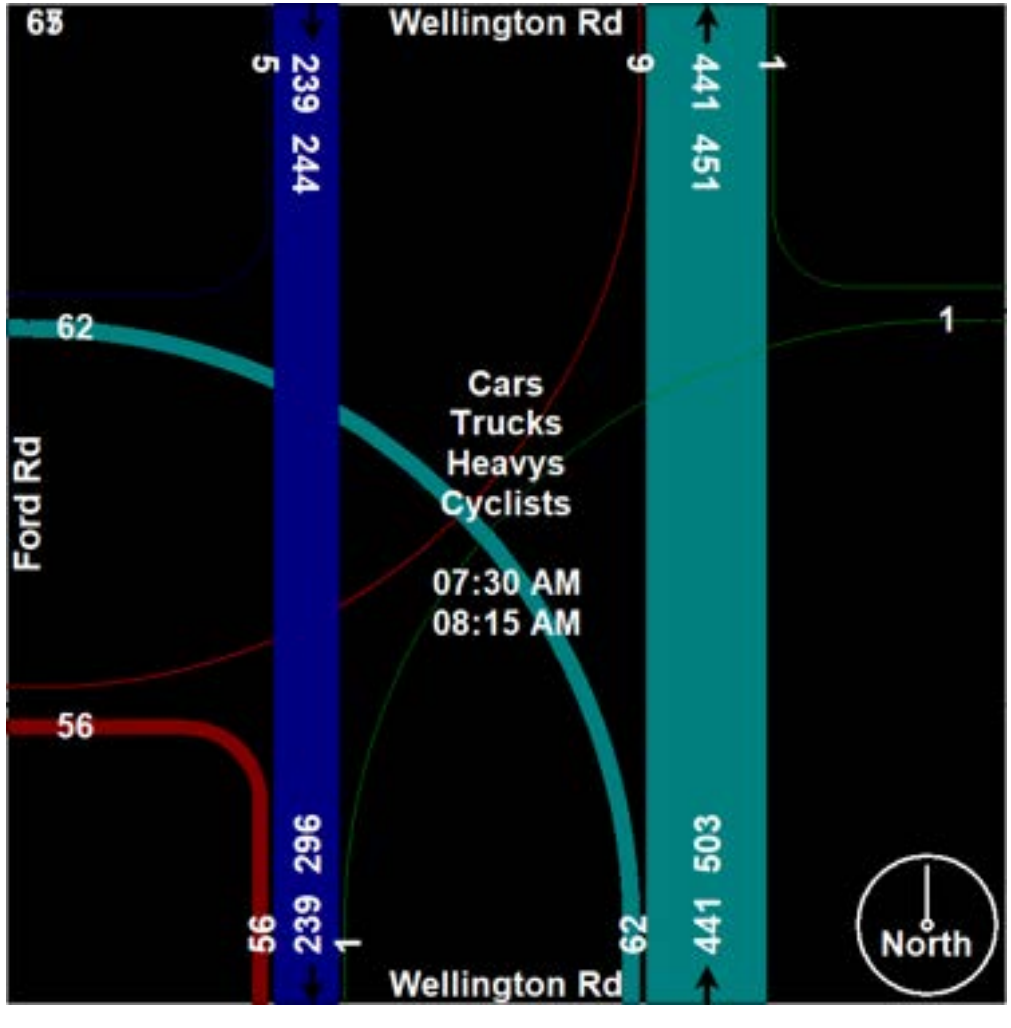


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 6



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019

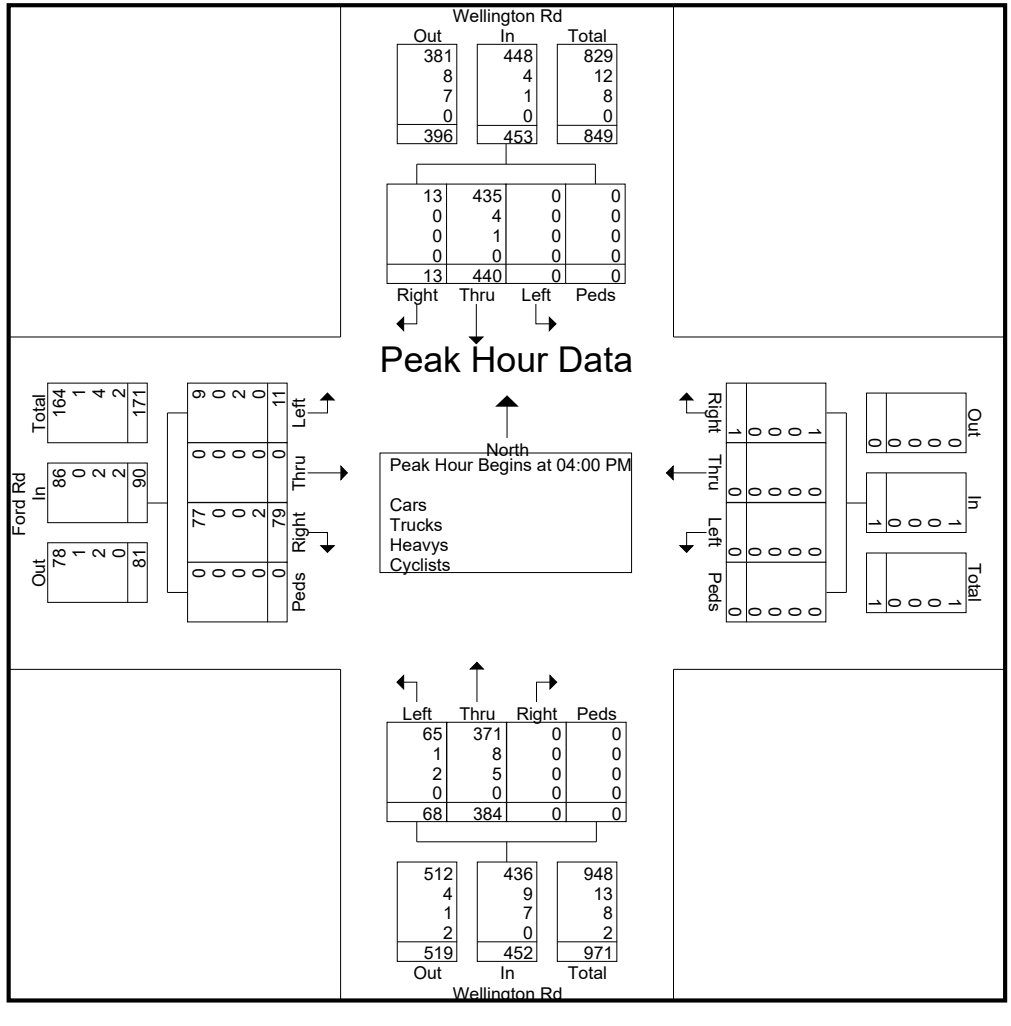
	Wellington Rd From North					From East					Wellington Rd From South					Ford Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**5**	95	0	0	100	0	0	0	0	0	0	94	**22**	0	116	11	0	2	0	13	229
04:15 PM	2	120	0	0	122	0	0	0	0	0	0	**103**	14	0	**117**	22	0	3	0	25	**264**
04:30 PM	3	99	0	0	102	**1**	0	0	0	**1**	0	96	19	0	115	**23**	0	**5**	0	**28**	246
04:45 PM	3	**126**	0	0	**129**	0	0	0	0	0	0	91	13	0	104	23	0	1	0	24	257
Total Volume	13	440	0	0	453	1	0	0	0	1	0	384	68	0	452	79	0	11	0	90	996
% App. Total	2.9	97.1	0	0		100	0	0	0		0	85	15	0		87.8	0	12.2	0		
PHF	.650	.873	.000	.000	.878	.250	.000	.000	.000	.250	.000	.932	.773	.000	.966	.859	.000	.550	.000	.804	.943
Cars	13	435	0	0	448	1	0	0	0	1	0	371	65	0	436	77	0	9	0	86	971
% Cars	100	98.9	0	0	98.9	100	0	0	0	100	0	96.6	95.6	0	96.5	97.5	0	81.8	0	95.6	97.5
Trucks	0	4	0	0	4	0	0	0	0	0	0	8	1	0	9	0	0	0	0	0	13
% Trucks	0	0.9	0	0	0.9	0	0	0	0	0	0	2.1	1.5	0	2.0	0	0	0	0	0	1.3
Heavys	0	1	0	0	1	0	0	0	0	0	0	5	2	0	7	0	0	2	0	2	10
% Heavys	0	0.2	0	0	0.2	0	0	0	0	0	0	1.3	2.9	0	1.5	0	0	18.2	0	2.2	1.0
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	0	0	0	2.2	0.2

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 8

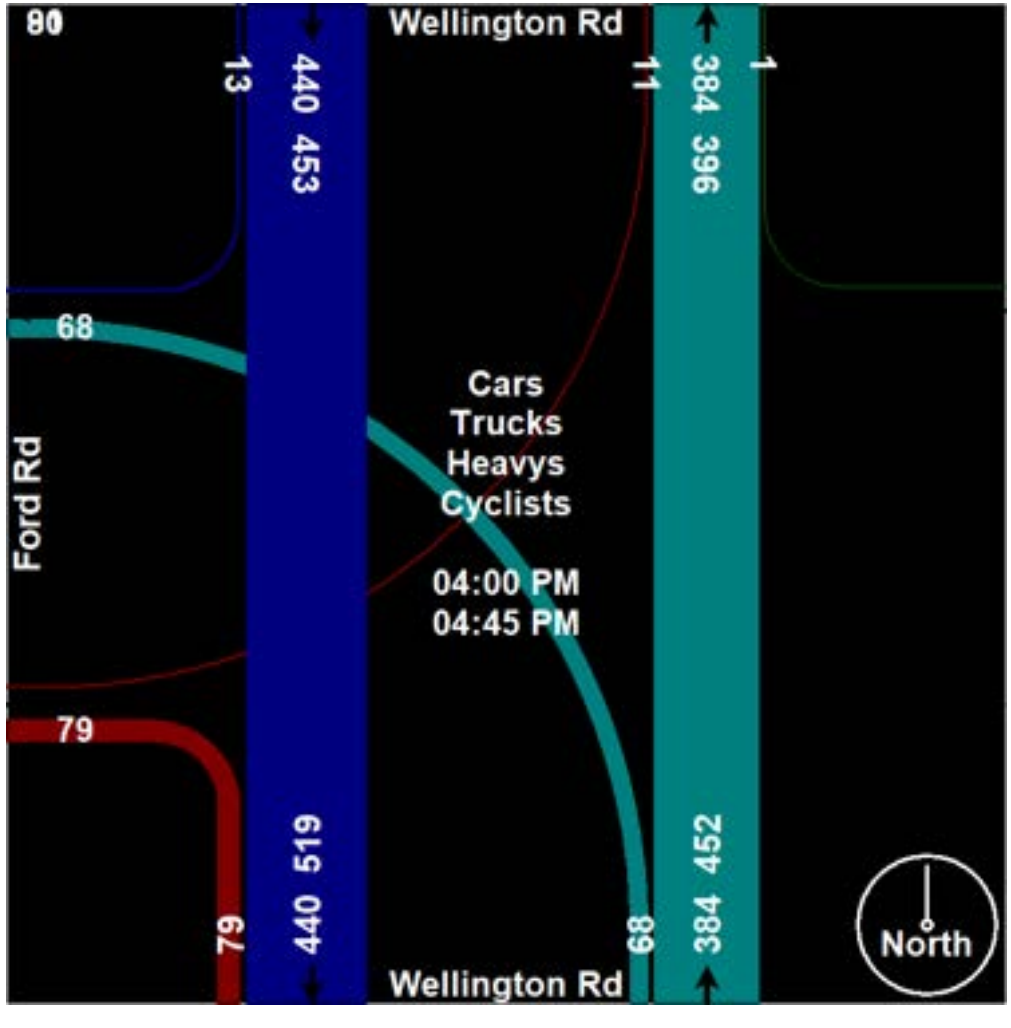


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Ford Rd at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 9



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 1

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Wellington Rd From North					St George St From East					Wellington Rd From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	25	12	0	37	25	0	3	0	28	2	80	0	0	82	0	0	0	0	0	147
07:15 AM	0	41	7	0	48	29	0	4	0	33	1	92	0	0	93	0	0	0	0	0	174
07:30 AM	0	50	15	0	65	39	0	4	0	43	0	124	0	0	124	0	0	0	0	0	232
07:45 AM	0	75	20	0	95	22	0	3	1	26	2	93	1	0	96	0	0	0	0	0	217
Total	0	191	54	0	245	115	0	14	1	130	5	389	1	0	395	0	0	0	0	0	770
08:00 AM	0	44	23	0	67	31	0	2	2	35	3	77	1	0	81	0	0	0	0	0	183
08:15 AM	1	42	28	0	71	27	0	0	0	27	2	90	1	0	93	0	0	2	0	2	193
08:30 AM	0	49	26	0	75	21	0	2	2	25	1	71	0	0	72	0	0	1	0	1	173
08:45 AM	0	42	25	0	67	23	0	3	0	26	7	52	0	0	59	0	0	0	0	0	152
Total	1	177	102	0	280	102	0	7	4	113	13	290	2	0	305	0	0	3	0	3	701
09:00 AM	2	46	17	0	65	15	0	1	1	17	1	63	0	0	64	0	1	0	0	1	147
09:15 AM	2	37	28	0	67	24	0	0	0	24	1	62	0	0	63	1	0	0	0	1	155
09:30 AM	0	42	27	0	69	22	0	2	0	24	0	72	0	0	72	0	0	0	0	0	165
09:45 AM	0	30	15	0	45	19	0	1	0	20	3	72	0	0	75	0	0	1	0	1	141
Total	4	155	87	0	246	80	0	4	1	85	5	269	0	0	274	1	1	1	0	3	608
03:00 PM	0	58	35	0	93	29	0	1	0	30	3	64	0	0	67	0	1	0	0	1	191
03:15 PM	0	66	23	0	89	28	1	2	0	31	2	65	0	0	67	0	1	1	0	2	189
03:30 PM	0	76	38	0	114	22	0	2	0	24	2	53	1	0	56	0	0	0	0	0	194
03:45 PM	2	81	22	0	105	35	0	2	0	37	5	56	0	0	61	1	0	0	0	1	204
Total	2	281	118	0	401	114	1	7	0	122	12	238	1	0	251	1	2	1	0	4	778
04:00 PM	0	70	33	0	103	32	0	1	0	33	9	84	0	0	93	0	0	1	0	1	230
04:15 PM	1	102	42	0	145	23	0	1	0	24	2	90	0	0	92	1	0	0	0	1	262
04:30 PM	0	80	43	0	123	34	0	0	0	34	5	81	0	0	86	1	0	2	0	3	246
04:45 PM	0	104	44	0	148	21	0	2	0	23	4	81	0	0	85	0	0	0	0	0	256
Total	1	356	162	0	519	110	0	4	0	114	20	336	0	0	356	2	0	3	0	5	994
05:00 PM	1	76	40	0	117	36	0	0	0	36	5	70	0	0	75	0	0	0	0	0	228
05:15 PM	0	110	51	0	161	28	0	4	0	32	7	67	0	0	74	0	0	0	0	0	267
05:30 PM	0	102	61	0	163	18	0	1	1	20	9	66	1	0	76	0	0	0	0	0	259
05:45 PM	0	81	46	0	127	22	0	2	0	24	4	55	0	0	59	1	0	0	0	1	211
Total	1	369	198	0	568	104	0	7	1	112	25	258	1	0	284	1	0	0	0	1	965

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

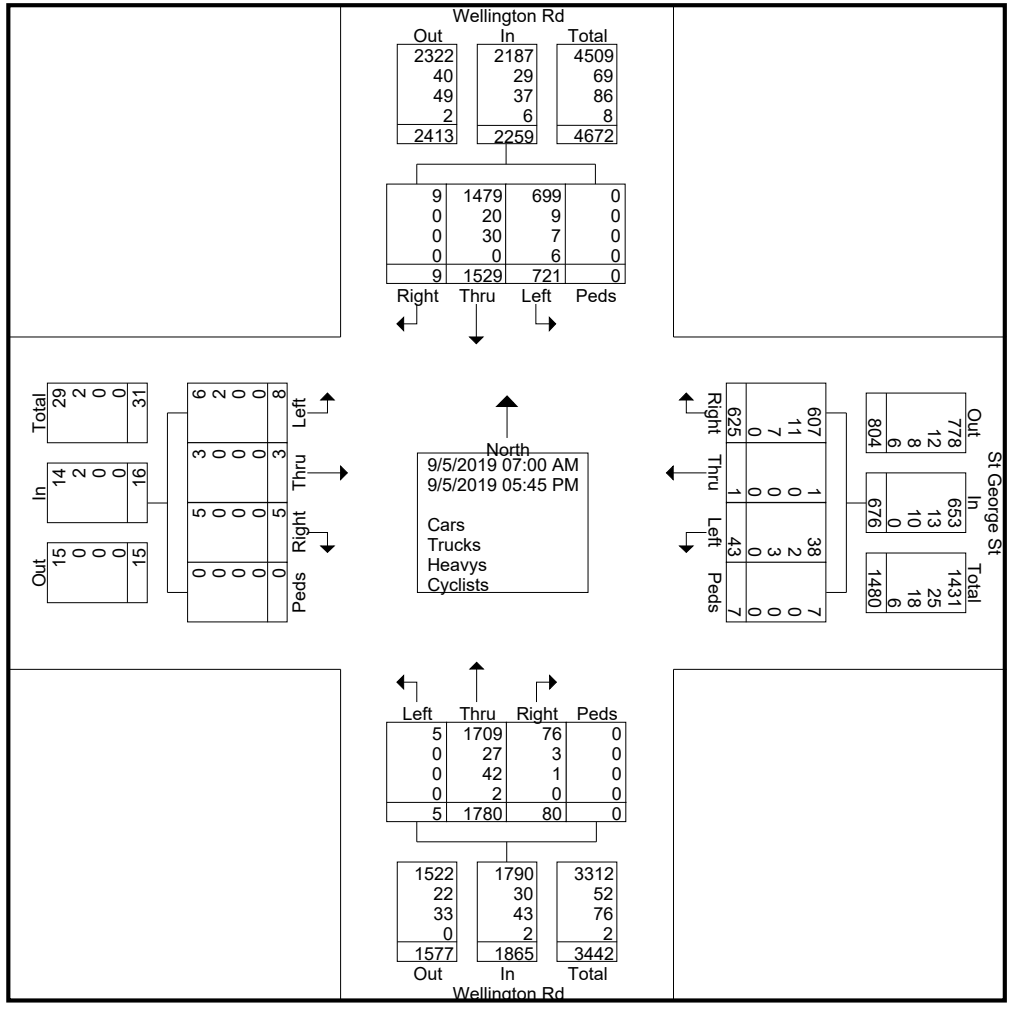
	Wellington Rd From North					St George St From East					Wellington Rd From South					From West					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Grand Total	9	1529	721	0	2259	625	1	43	7	676	80	1780	5	0	1865	5	3	8	0	16	4816
Apprch %	0.4	67.7	31.9	0		92.5	0.1	6.4	1		4.3	95.4	0.3	0		31.2	18.8	50	0		
Total %	0.2	31.7	15	0	46.9	13	0	0.9	0.1	14	1.7	37	0.1	0	38.7	0.1	0.1	0.2	0	0.3	
Cars	9	1479	699	0	2187	607	1	38	7	653	76	1709	5	0	1790	5	3	6	0	14	4644
% Cars	100	96.7	96.9	0	96.8	97.1	100	88.4	100	96.6	95	96	100	0	96	100	100	75	0	87.5	96.4
Trucks	0	20	9	0	29	11	0	2	0	13	3	27	0	0	30	0	0	2	0	2	74
% Trucks	0	1.3	1.2	0	1.3	1.8	0	4.7	0	1.9	3.8	1.5	0	0	1.6	0	0	25	0	12.5	1.5
Heavys	0	30	7	0	37	7	0	3	0	10	1	42	0	0	43	0	0	0	0	0	90
% Heavys	0	2	1	0	1.6	1.1	0	7	0	1.5	1.2	2.4	0	0	2.3	0	0	0	0	0	1.9
Cyclists	0	0	6	0	6	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	8
% Cyclists	0	0	0.8	0	0.3	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0.2

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 3



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019

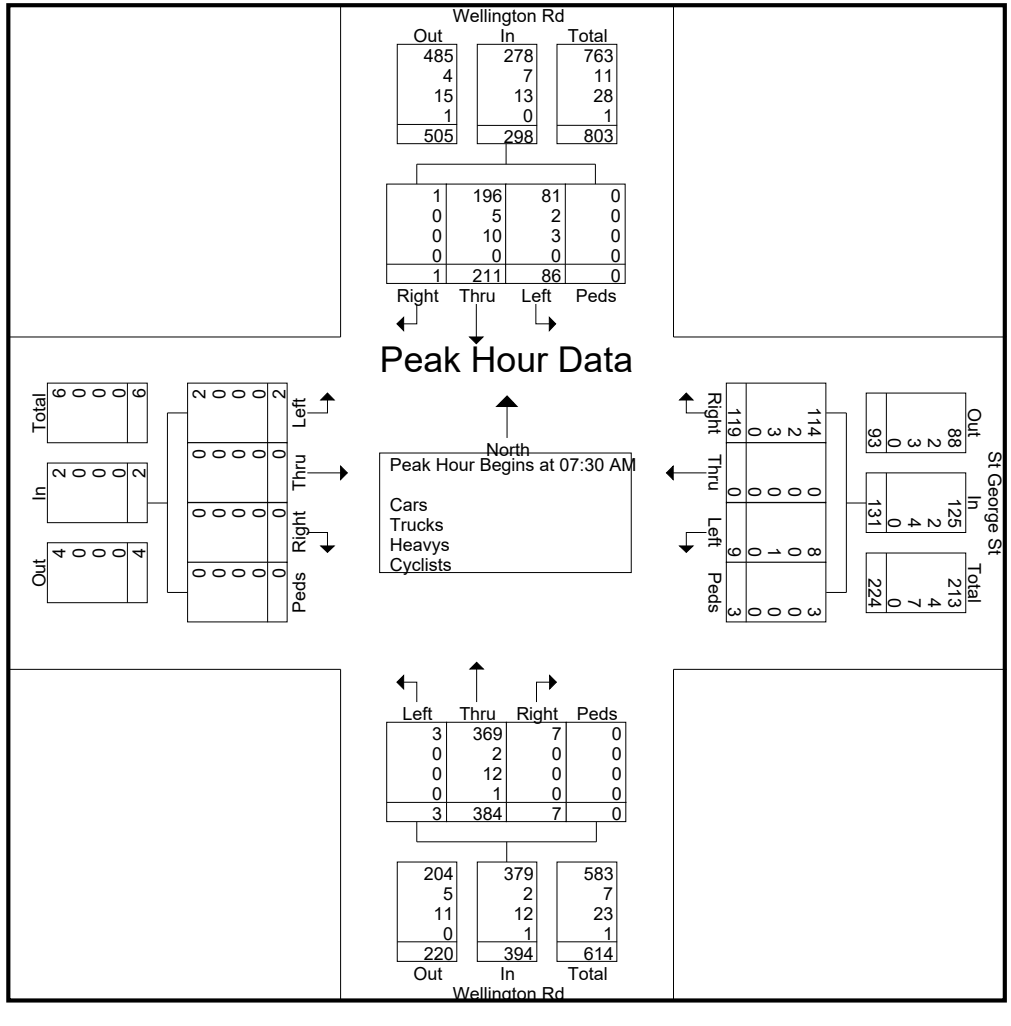
	Wellington Rd From North					St George St From East					Wellington Rd From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	50	15	0	65	**39**	0	**4**	0	**43**	0	**124**	0	0	**124**	0	0	0	0	0	**232**
07:45 AM	0	**75**	20	0	**95**	22	0	3	1	26	2	93	**1**	0	96	0	0	0	0	0	217
08:00 AM	0	44	23	0	67	31	0	2	**2**	35	**3**	77	1	0	81	0	0	0	0	0	183
08:15 AM	**1**	42	**28**	0	71	27	0	0	0	27	2	90	1	0	93	0	0	**2**	0	**2**	193
Total Volume	1	211	86	0	298	119	0	9	3	131	7	384	3	0	394	0	0	2	0	2	825
% App. Total	0.3	70.8	28.9	0		90.8	0	6.9	2.3		1.8	97.5	0.8	0		0	0	100	0		
PHF	.250	.703	.768	.000	.784	.763	.000	.563	.375	.762	.583	.774	.750	.000	.794	.000	.000	.250	.000	.250	.889
Cars	1	196	81	0	278	114	0	8	3	125	7	369	3	0	379	0	0	2	0	2	784
% Cars	100	92.9	94.2	0	93.3	95.8	0	88.9	100	95.4	100	96.1	100	0	96.2	0	0	100	0	100	95.0
Trucks	0	5	2	0	7	2	0	0	0	2	0	2	0	0	2	0	0	0	0	0	11
% Trucks	0	2.4	2.3	0	2.3	1.7	0	0	0	1.5	0	0.5	0	0	0.5	0	0	0	0	0	1.3
Heavys	0	10	3	0	13	3	0	1	0	4	0	12	0	0	12	0	0	0	0	0	29
% Heavys	0	4.7	3.5	0	4.4	2.5	0	11.1	0	3.1	0	3.1	0	0	3.0	0	0	0	0	0	3.5
Cyclists	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.1

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 5

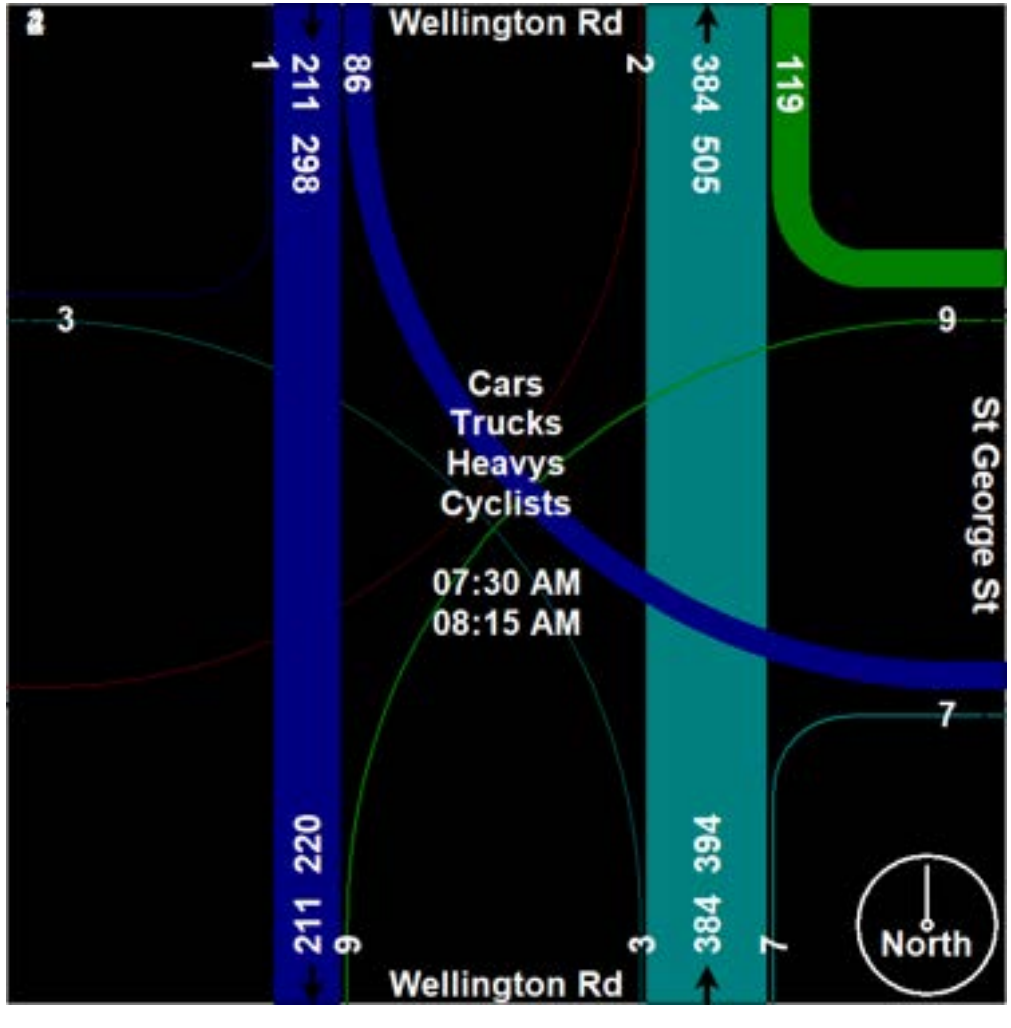


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 6



Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 7

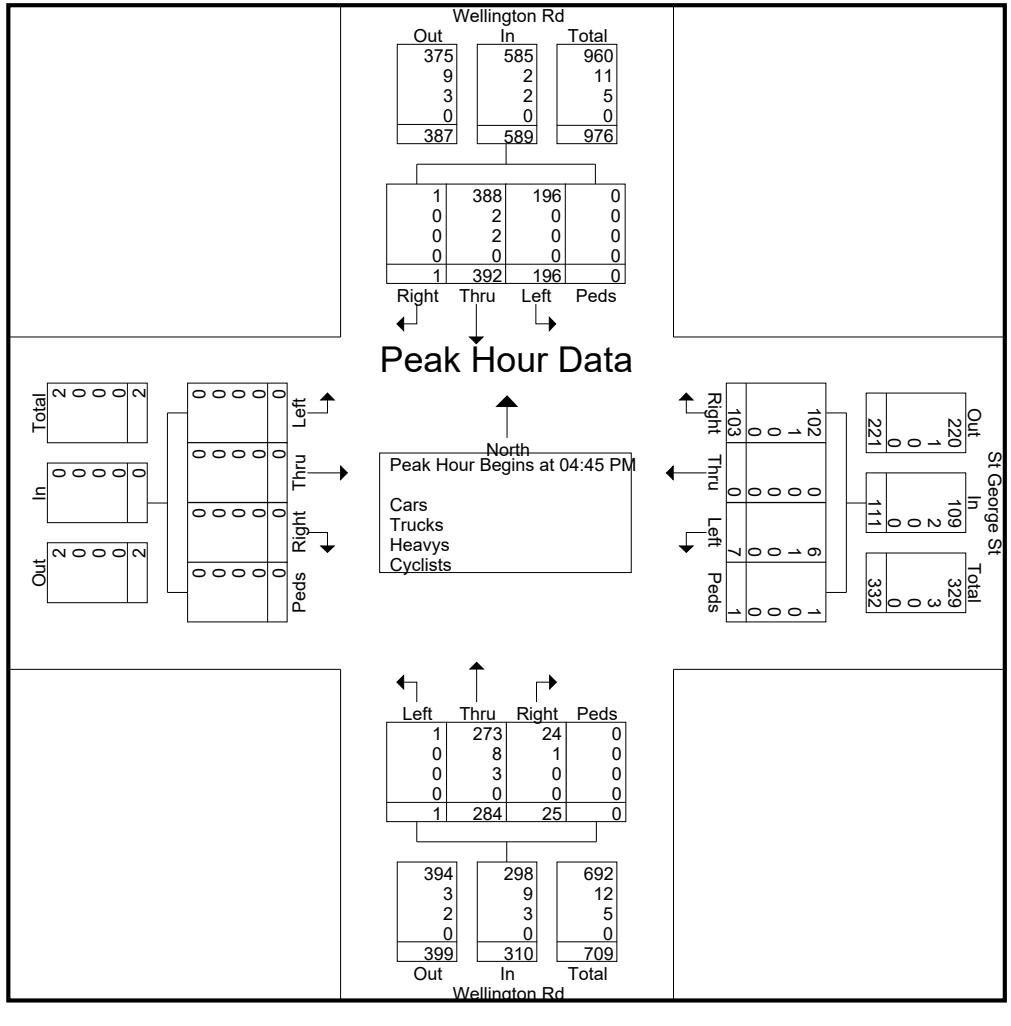
	Wellington Rd From North					St George St From East					Wellington Rd From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	104	44	0	148	21	0	2	0	23	4	**81**	0	0	**85**	0	0	0	0	0	256
05:00 PM	**1**	76	40	0	117	**36**	0	0	0	**36**	5	70	0	0	75	0	0	0	0	0	228
05:15 PM	0	**110**	51	0	161	28	0	**4**	0	32	7	67	0	0	74	0	0	0	0	0	**267**
05:30 PM	0	102	**61**	0	**163**	18	0	1	**1**	20	**9**	66	**1**	0	76	0	0	0	0	0	259
Total Volume	1	392	196	0	589	103	0	7	1	111	25	284	1	0	310	0	0	0	0	0	1010
% App. Total	0.2	66.6	33.3	0		92.8	0	6.3	0.9		8.1	91.6	0.3	0		0	0	0	0		
PHF	.250	.891	.803	.000	.903	.715	.000	.438	.250	.771	.694	.877	.250	.000	.912	.000	.000	.000	.000	.000	.946
Cars	1	388	196	0	585	102	0	6	1	109	24	273	1	0	298	0	0	0	0	0	992
% Cars	100	99.0	100	0	99.3	99.0	0	85.7	100	98.2	96.0	96.1	100	0	96.1	0	0	0	0	0	98.2
Trucks	0	2	0	0	2	1	0	1	0	2	1	8	0	0	9	0	0	0	0	0	13
% Trucks	0	0.5	0	0	0.3	1.0	0	14.3	0	1.8	4.0	2.8	0	0	2.9	0	0	0	0	0	1.3
Heavys	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
% Heavys	0	0.5	0	0	0.3	0	0	0	0	0	0	1.1	0	0	1.0	0	0	0	0	0	0.5
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 8

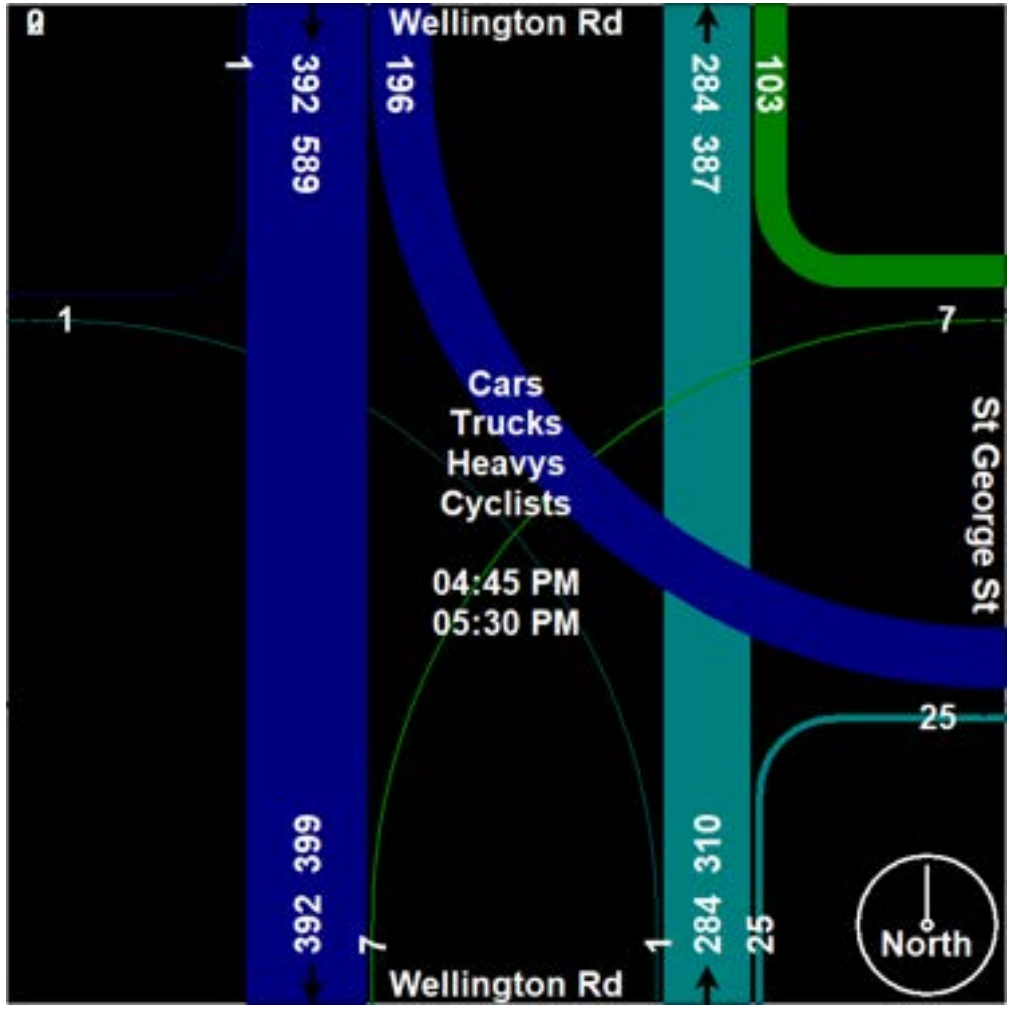


Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : St George St at Wellington Rd
Site Code : 00000000
Start Date : 9/5/2019
Page No : 9



Sunset Drive & Wellington Road

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

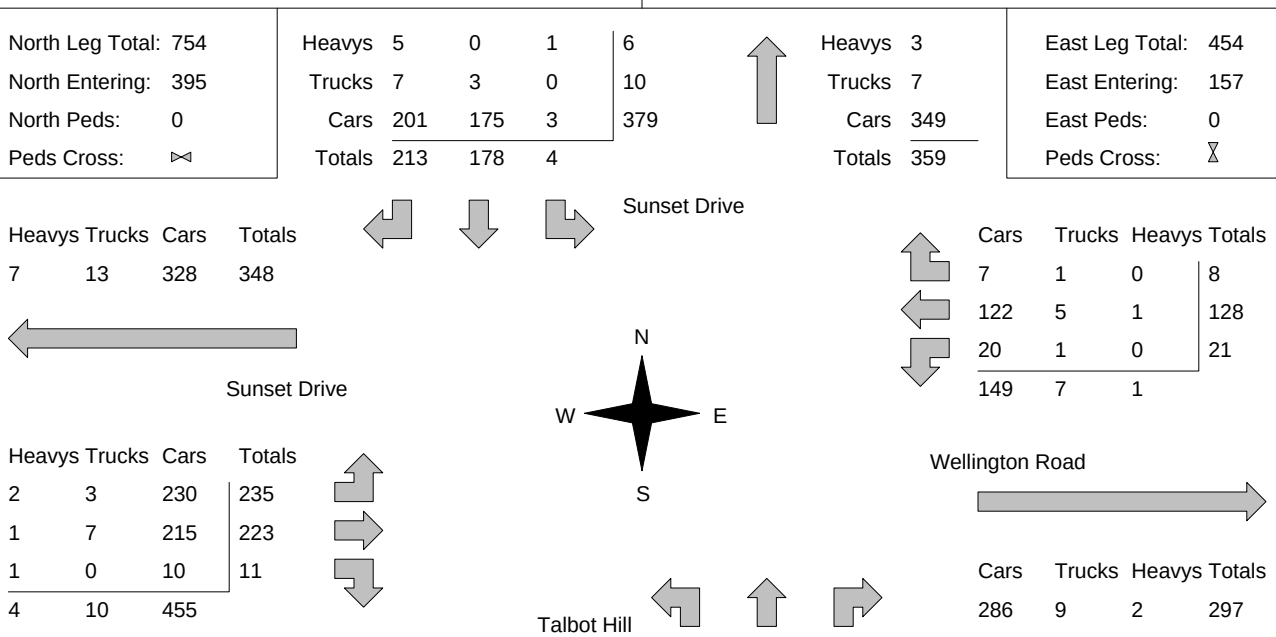
Municipality: St. Thomas
Site #: 0000000119
Intersection: Sunset Drive & Wellington Road
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Enver

**** Non-Signalized Intersection ****

Major Road: Sunset Drive runs N/S



Comments

Roundabout

Sunset Drive & Wellington Road

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 11:30:00
To: 12:30:00

Municipality: St. Thomas
Site #: 0000000119
Intersection: Sunset Drive & Wellington Road
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Enver

**** Non-Signalized Intersection ****

Major Road: Sunset Drive runs N/S

North Leg Total:	509
North Entering:	253
North Peds:	0
Peds Cross:	⋈

Heavys	1	0	0	1
Trucks	2	2	0	4
Cars	103	140	5	248
Totals	106	142	5	

Heavys	2
Trucks	19
Cars	235
Totals	256

East Leg Total:	391
East Entering:	184
East Peds:	2
Peds Cross:	⧖

Sunset Drive

Heavys	Trucks	Cars	Totals
2	7	218	227

Cars	Trucks	Heavys	Totals
8	0	0	8
107	5	1	113
60	3	0	63
175	8	1	

Sunset Drive

N
W E
S

Heavys	Trucks	Cars	Totals
1	7	122	130
1	6	132	139
0	1	16	17
2	14	270	

Wellington Road

Cars	Trucks	Heavys	Totals
197	8	2	207

Talbot Hill

Peds Cross:	⧖
West Peds:	0
West Entering:	286
West Leg Total:	513

Cars	216
Trucks	6
Heavys	0
Totals	222

Cars	8	105	60	173
Trucks	0	12	2	14
Heavys	0	1	1	2
Totals	8	118	63	

Peds Cross:	⋈
South Peds:	0
South Entering:	189
South Leg Total:	411

Comments

Roundabout

Sunset Drive & Wellington Road

Afternoon Peak Diagram

Specified Period
From: 14:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

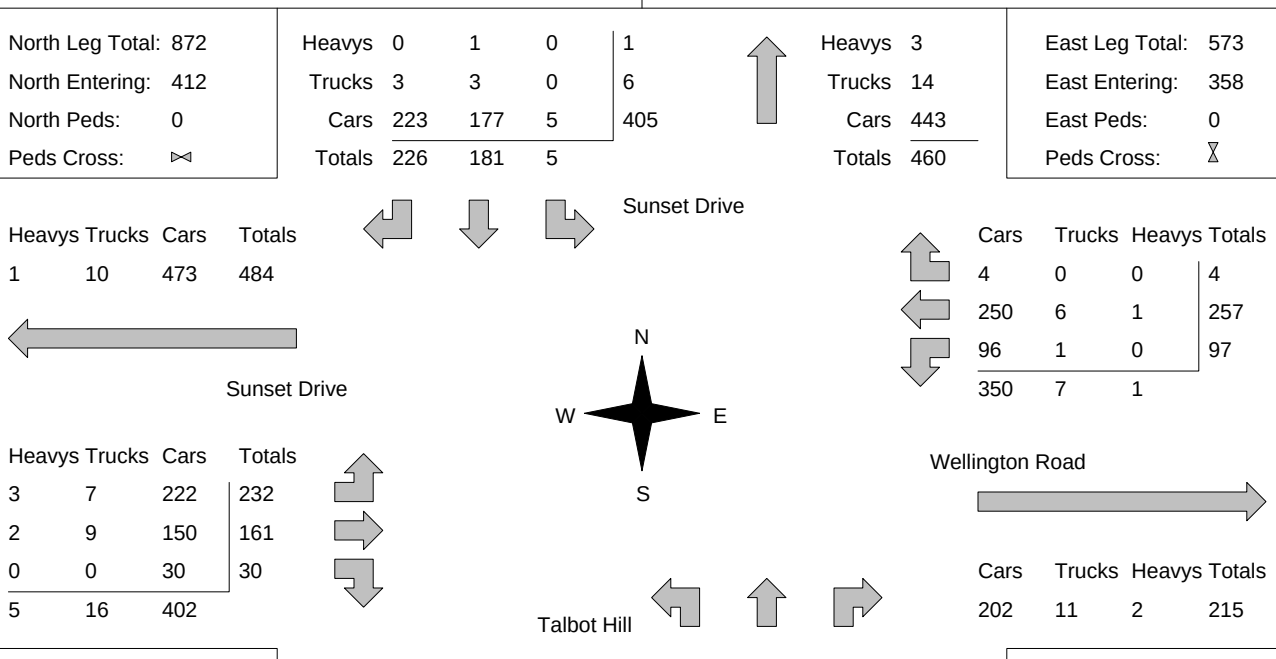
Municipality: St. Thomas
Site #: 0000000119
Intersection: Sunset Drive & Wellington Road
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Enver

**** Non-Signalized Intersection ****

Major Road: Sunset Drive runs N/S



Comments

Roundabout

Sunset Drive & Wellington Road

Total Count Diagram

Municipality: St. Thomas
Site #: 0000000119
Intersection: Sunset Drive & Wellington Road
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Enver

**** Non-Signalized Intersection ****

Major Road: Sunset Drive runs N/S

North Leg Total:	5219
North Entering:	2631
North Peds:	0
Peds Cross:	⋈

Heavys	13	9	2	24
Trucks	44	29	2	75
Cars	1236	1268	28	2532
Totals	1293	1306	32	

Heavys	25
Trucks	78
Cars	2485
Totals	2588

East Leg Total:	3423
East Entering:	1736
East Peds:	2
Peds Cross:	⧖

Sunset Drive

Heavys	Trucks	Cars	Totals
21	90	2426	2537

Cars	Trucks	Heavys	Totals
56	1	1	58
1147	44	7	1198
466	14	0	480
1669	59	8	

Sunset Drive

N
W E
S

Heavys	Trucks	Cars	Totals
20	43	1307	1370
15	58	1114	1187
4	2	111	117
39	103	2532	

Wellington Road

Cars	Trucks	Heavys	Totals
1587	81	19	1687

Talbot Hill

Peds Cross:	⧖
West Peds:	1
West Entering:	2674
West Leg Total:	5211

Cars	1845
Trucks	45
Heavys	13
Totals	1903

Cars	43	1122	445	1610
Trucks	2	34	21	57
Heavys	1	4	2	7
Totals	46	1160	468	

Peds Cross:	⋈
South Peds:	1
South Entering:	1674
South Leg Total:	3577

Comments

Roundabout

Sunset Drive & Wellington Road
Traffic Count Summary

Intersection: Sunset Drive & Wellington Road | **Count Date:** 15-Nov-2017 | **Municipality:** St. Thomas

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	7	114	162	283	0	480
9:00:00	2	210	200	412	0	593
11:00:00	0	0	0	0	0	0
12:00:00	5	138	124	267	0	429
13:00:00	3	150	107	260	0	460
14:00:00	0	0	0	0	0	0
15:00:00	3	142	123	268	0	487
16:00:00	4	158	168	330	0	531
17:00:00	5	179	214	398	0	672
18:00:00	3	215	195	413	0	653
Totals:	32	1306	1293	2631	0	4305

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	10	114	73	197	0
9:00:00	5	112	64	181	1
11:00:00	0	0	0	0	0
12:00:00	5	102	55	162	0
13:00:00	9	132	59	200	0
14:00:00	0	0	0	0	0
15:00:00	12	143	64	219	0
16:00:00	3	149	49	201	0
17:00:00	2	220	52	274	0
18:00:00	0	188	52	240	0
Totals:	46	1160	468	1674	1

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	22	95	5	122	0	582
9:00:00	39	111	14	164	0	578
11:00:00	0	0	0	0	0	1
12:00:00	58	106	9	173	1	429
13:00:00	44	107	3	154	1	413
14:00:00	0	0	0	0	0	0
15:00:00	57	117	8	182	0	401
16:00:00	77	205	8	290	0	616
17:00:00	85	242	4	331	0	754
18:00:00	98	215	7	320	0	636
Totals:	480	1198	58	1736	2	4410

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	219	236	5	460	0
9:00:00	210	192	12	414	0
11:00:00	0	1	0	1	0
12:00:00	120	122	14	256	0
13:00:00	117	125	17	259	1
14:00:00	0	0	0	0	0
15:00:00	118	93	8	219	0
16:00:00	187	120	19	326	0
17:00:00	231	169	23	423	0
18:00:00	168	129	19	316	0
Totals:	1370	1187	117	2674	1

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	477	442	300	286	292	469	558	481

Sunset Drive & Wellington Road

Count Date: 15-Nov-2017
Intersection: Sunset Drive & Wellington Road **Municipality:** St. Thomas
Major Road: Sunset Drive **Major Road Runs:** N/S two lanes each way
Operating Speed of Major Road: 60 km/hr **Operating under restricted flow conditions**

Warrant #1: Minimum Vehicular Volumes.

A. All Approaches. **80% Satisfied**

No. of Lanes	Minimum Requirements					Hours Ending								Percentage Warrant
	1 Lane Each Way		2 Lanes Each Way		3 Lanes									
Flow Condition	1 Lane F. Flow (Code 1)	1 Lane R. Flow (Code 2)	2 Lane F. Flow (Code 3)	2 Lane R. Flow (Code 4)	or More R. Flow (Code 5)	8:00	9:00	12:00	13:00	15:00	16:00	17:00	18:00	
100%	480	720	600	900	900	1062	1171	858	873	888	1147	1426	1289	100%
80%	385	575	480	720	720									Yes: No: X
All Approaches	100% Fulfilled					100	100				100	100	100	500
	80% Fulfilled							80	80	80				240
	Actual % if Below 80%													0
													Total:	740
													Actual Average (Total/8):	93%

B. Minor Street Both Approaches.

100%	120	170	120	170	170	582	578	429	413	401	616	754	636	100%
80%	95	135	95	135	135									Yes: X No:
Minor Street Both Approaches	100% Fulfilled					100	100	100	100	100	100	100	100	800
	80% Fulfilled													0
	Actual % if Below 80%													0
													Total:	800
													Actual Average (Total/8):	100%

Sunset Drive & Wellington Road

Count Date: 15-Nov-2017
Intersection: Sunset Drive & Wellington Road **Municipality:** St. Thomas
Major Road: Sunset Drive **Major Road Runs:** N/S two lanes each way
Operating Speed of Major Road: 60 km/hr **Operating under restricted flow conditions**

Warrant #2: Delay to Cross Traffic.

A. Major Street Both Approaches. **Not Satisfied**

No. of Lanes	Minimum Requirements					Hours Ending								
	1 Lane Each Way		2 Lanes Each Way		3 Lanes									
Flow Condition	1 Lane F. Flow (Code 1)	1 Lane R. Flow (Code 2)	2 Lane F. Flow (Code 3)	2 Lane R. Flow (Code 4)	or More R. Flow (Code 5)	8:00	9:00	12:00	13:00	15:00	16:00	17:00	18:00	Percentage Warrant
100%	480	720	600	900	900	480	593	429	460	487	531	672	653	100%
80%	385	575	480	720	720									Yes: No: X
All Approaches	100% Fulfilled													0
	80% Fulfilled													0
	Actual % if Below 80%					53	66	48	51	54	59	75	73	478

Total:	478
Actual Average (Total/8):	60%

B. Traffic Crossing Major Street.

100%	50	75	50	75	75	477	442	300	286	292	469	558	481	100%
80%	40	60	40	60	60									Yes: X No:
All Approaches	100% Fulfilled					100	100	100	100	100	100	100	100	800
	80% Fulfilled													0
	Actual % if Below 80%													0

Total:	800
Actual Average (Total/8):	100%

Sunset Drive & Wellington Road

Count Date: 15-Nov-2017
Intersection: Sunset Drive & Wellington Road **Municipality:** St. Thomas
Major Road: Sunset Drive **Major Road Runs:** N/S two lanes each way
Operating Speed of Major Road: 60 km/hr **Operating under restricted flow conditions**

Warrant #3: Accident Experience.

Not Satisfied

A. Reportable accidents within a twelve month period averaged over 36 consequtive months susceptible to correction by a traffic signal.

Minimum Requirements	Actual Number of Accidents	Average Number of Accidents	Fulfilled
5	0 in 0 years	Invalid	0%

B. Adequate trial of less restrictive remedies has failed to reduce accident frequency.	No
C. Either Warrant 1 (Minimum Vehicular Volume) or Warrant 2 (Delay to Cross Traffic) satisfied 80% or more.	Yes

Warrant #4: Combination Warrant.
(Used if no warrant satisfied 100%)

Not Satisfied

Minimum Requirements	Warrant Satisfied 80% or More	Fulfilled
Two Warrants Satisfied 80%	Warrant 1 (Minimum Vehicular Volume) Warrant 2 (Delay to Cross Traffic) Warrant 3 (Accident Experience)	Yes No No

Conclusion: Traffic signal not warranted.

Appendix C

LOS Definitions

LEVEL OF SERVICE[1]

Level of Service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. This concept was introduced in the 1965 *Highway Capacity Manual* as a criteria for interrupted flow conditions. The 2000 *Highway Capacity Manual* changed the basis for measuring Level of Service at intersections to control delay[2].

Six Levels of Service are defined with LOS A representing the best operating conditions, and LOS F the worst (briefly described below). It should be noted that there is often significant variability in the amount of delay experienced by individual drivers.

LOS A: This Level of Service describes the highest quality of traffic flow and is referred to as free flow. The approach appears open, turning movements are easily made and drivers have freedom of operation. Control delay is less than 10 seconds/vehicle.

LOS B: This Level of Service is referred to as a stable flow. Drivers feel somewhat restricted and occasionally may have to wait to complete the minor movement. Control delay is 10-15 seconds/vehicle for unsignalized intersections and 10-20 seconds/vehicle for signalized intersections.

LOS C: At this level, the operation is stable. Drivers feel more restricted and may have to wait, with queues developing for short periods. Control delay is 15-25 seconds/vehicle at unsignalized intersections and 20-35 seconds/vehicle at signalized intersections.

LOS D: At this level, traffic is approaching unstable flow. The motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough gaps to lower demand to permit occasional clearance of developing queues and prevent excessive back-ups. Control delay is 25-35 seconds/vehicle at unsignalized intersections and 35-55 seconds/vehicle at signalized intersections.

LOS E: At this level capacity occurs. Long queues of vehicles exist and delays to vehicles may extend. Control delay is 35-50 seconds/vehicle at unsignalized intersections and 55-80 seconds/vehicle at signalized intersections.

LOS F: At this Level of Service, the intersection has failed. Capacity of the intersection has been exceeded. Control delay exceeds 50 seconds/vehicle at unsignalized intersections and exceeds 80 seconds/vehicle at signalized intersections.

---

[1] *Transportation Research Board: Highway Capacity Manual 1965, 2000*

[2] *Control delay is defined as the component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition.*

Appendix D

Synchro Analysis Worksheets



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	6	373	0	7	408
Future Volume (Veh/h)	3	6	373	0	7	408
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	7	429	0	8	469
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	914	429			429	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	914	429			429	
tC, single (s)	6.7	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	266	630			1141	

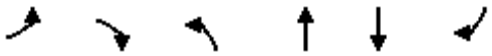
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	10	429	477
Volume Left	3	0	8
Volume Right	7	0	0
cSH	446	1700	1141
Volume to Capacity	0.02	0.25	0.01
Queue Length 95th (m)	0.5	0.0	0.2
Control Delay (s)	13.2	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	13.2	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	2	37	4	3	55	9	4	2	12	21	2	4
Future Volume (Veh/h)	2	37	4	3	55	9	4	2	12	21	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	46	5	4	68	11	5	2	15	26	2	5
Pedestrians											7	
Lane Width (m)											4.2	
Walking Speed (m/s)											1.2	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	86			51			140	146	48	157	144	80
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	86			51			140	146	48	157	144	80
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	99	97	100	99
cM capacity (veh/h)	1513			1568			817	737	1020	777	743	978

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	53	83	22	33
Volume Left	2	4	5	26
Volume Right	5	11	15	5
cSH	1513	1568	935	800
Volume to Capacity	0.00	0.00	0.02	0.04
Queue Length 95th (m)	0.0	0.1	0.6	1.0
Control Delay (s)	0.3	0.4	8.9	9.7
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.4	8.9	9.7
Approach LOS			A	A

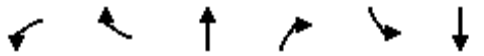
Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	19.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	61	62	441	239	5
Future Volume (Veh/h)	9	61	62	441	239	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	10	70	71	507	275	6
Pedestrians	3					
Lane Width (m)	4.2					
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	927	278	284			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	927	278	284			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	96	91	94			
cM capacity (veh/h)	270	738	1275			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	10	70	71	507	275	6
Volume Left	10	0	71	0	0	0
Volume Right	0	70	0	0	0	6
cSH	270	738	1275	1700	1700	1700
Volume to Capacity	0.04	0.09	0.06	0.30	0.16	0.00
Queue Length 95th (m)	0.9	2.5	1.4	0.0	0.0	0.0
Control Delay (s)	18.8	10.4	8.0	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	11.4		1.0		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	119	383	7	86	211
Future Volume (Veh/h)	9	119	383	7	86	211
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	10	135	435	8	98	240
Pedestrians	3					
Lane Width (m)	4.7					
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	874	438			446	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	874	438			446	
tC, single (s)	6.5	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	96	78			91	
cM capacity (veh/h)	280	613			1090	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	10	135	435	8	98	240
Volume Left	10	0	0	0	98	0
Volume Right	0	135	0	8	0	0
cSH	280	613	1700	1700	1090	1700
Volume to Capacity	0.04	0.22	0.26	0.00	0.09	0.14
Queue Length 95th (m)	0.9	6.7	0.0	0.0	2.4	0.0
Control Delay (s)	18.3	12.5	0.0	0.0	8.6	0.0
Lane LOS	C	B			A	
Approach Delay (s)	12.9		0.0		2.5	
Approach LOS	B					

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	12	472	6	10	454
Future Volume (Veh/h)	2	12	472	6	10	454
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	13	497	6	11	478
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	1000	500			503	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1000	500			503	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	99	98			99	
cM capacity (veh/h)	269	575			1021	

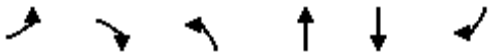
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	15	503	489
Volume Left	2	0	11
Volume Right	13	6	0
cSH	499	1700	1021
Volume to Capacity	0.03	0.30	0.01
Queue Length 95th (m)	0.7	0.0	0.3
Control Delay (s)	12.4	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	0.3
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	11	87	3	12	32	20	0	4	11	14	5	2
Future Volume (Veh/h)	11	87	3	12	32	20	0	4	11	14	5	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	11	91	3	13	33	21	0	4	11	15	5	2
Pedestrians		1			1			1				
Lane Width (m)		3.2			3.2			3.4				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	54			95			190	196	94	198	186	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			95			190	196	94	198	186	44
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	99	99	98	99	100
cM capacity (veh/h)	1564			1510			757	692	966	743	700	1030

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	105	67	15	22
Volume Left	11	13	0	15
Volume Right	3	21	11	2
cSH	1564	1510	874	752
Volume to Capacity	0.01	0.01	0.02	0.03
Queue Length 95th (m)	0.2	0.2	0.4	0.7
Control Delay (s)	0.8	1.5	9.2	9.9
Lane LOS	A	A	A	A
Approach Delay (s)	0.8	1.5	9.2	9.9
Approach LOS			A	A

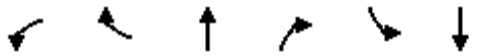
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	22.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	107	57	332	486	7
Future Volume (Veh/h)	5	107	57	332	486	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	114	61	353	517	7
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	992	517	524			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	992	517	524			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	80	94			
cM capacity (veh/h)	259	562	1043			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	114	61	353	517	7
Volume Left	5	0	61	0	0	0
Volume Right	0	114	0	0	0	7
cSH	259	562	1043	1700	1700	1700
Volume to Capacity	0.02	0.20	0.06	0.21	0.30	0.00
Queue Length 95th (m)	0.5	6.0	1.5	0.0	0.0	0.0
Control Delay (s)	19.2	13.0	8.7	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	13.3		1.3		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	7	103	286	25	196	397
Future Volume (Veh/h)	7	103	286	25	196	397
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	7	110	304	27	209	422
Pedestrians	1					
Lane Width (m)	4.7					
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	1145	305			332	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1145	305			332	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	96	85			83	
cM capacity (veh/h)	174	736			1237	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	110	304	27	209	422
Volume Left	7	0	0	0	209	0
Volume Right	0	110	0	27	0	0
cSH	174	736	1700	1700	1237	1700
Volume to Capacity	0.04	0.15	0.18	0.02	0.17	0.25
Queue Length 95th (m)	1.0	4.2	0.0	0.0	4.9	0.0
Control Delay (s)	26.6	10.7	0.0	0.0	8.5	0.0
Lane LOS	D	B			A	
Approach Delay (s)	11.7		0.0		2.8	
Approach LOS	B					

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	8	538	0	9	603
Future Volume (Veh/h)	4	8	538	0	9	603
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	5	9	618	0	10	693
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	1331	618			618	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1331	618			618	
tC, single (s)	6.7	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	145	493			972	

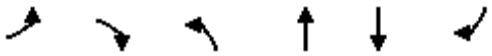
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	618	703
Volume Left	5	0	10
Volume Right	9	0	0
cSH	265	1700	972
Volume to Capacity	0.05	0.36	0.01
Queue Length 95th (m)	1.3	0.0	0.2
Control Delay (s)	19.3	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	19.3	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	3	71	5	4	79	12	5	3	16	27	3	5
Future Volume (Veh/h)	3	71	5	4	79	12	5	3	16	27	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	4	88	6	5	98	15	6	4	20	33	4	6
Pedestrians											7	
Lane Width (m)											4.2	
Walking Speed (m/s)											1.2	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	120			94			222	229	91	244	224	112
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120			94			222	229	91	244	224	112
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	98	95	99	99
cM capacity (veh/h)	1470			1513			718	662	967	675	669	939

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	98	118	30	43
Volume Left	4	5	6	33
Volume Right	6	15	20	6
cSH	1470	1513	855	702
Volume to Capacity	0.00	0.00	0.04	0.06
Queue Length 95th (m)	0.1	0.1	0.9	1.6
Control Delay (s)	0.3	0.3	9.4	10.5
Lane LOS	A	A	A	B
Approach Delay (s)	0.3	0.3	9.4	10.5
Approach LOS			A	B

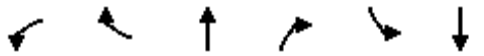
Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	22.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	102	88	581	334	7
Future Volume (Veh/h)	12	102	88	581	334	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	14	117	101	668	384	8
Pedestrians	3					
Lane Width (m)	4.2					
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	1257	387	395			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1257	387	395			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	92	82	91			
cM capacity (veh/h)	165	640	1160			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	14	117	101	668	384	8
Volume Left	14	0	101	0	0	0
Volume Right	0	117	0	0	0	8
cSH	165	640	1160	1700	1700	1700
Volume to Capacity	0.08	0.18	0.09	0.39	0.23	0.00
Queue Length 95th (m)	2.2	5.3	2.3	0.0	0.0	0.0
Control Delay (s)	28.9	11.9	8.4	0.0	0.0	0.0
Lane LOS	D	B	A			
Approach Delay (s)	13.7		1.1		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	165	503	9	142	290
Future Volume (Veh/h)	12	165	503	9	142	290
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	14	188	572	10	161	330
Pedestrians	3					
Lane Width (m)	4.7					
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	1227	575			585	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1227	575			585	
tC, single (s)	6.5	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	91	63			83	
cM capacity (veh/h)	157	512			967	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	14	188	572	10	161	330
Volume Left	14	0	0	0	161	0
Volume Right	0	188	0	10	0	0
cSH	157	512	1700	1700	967	1700
Volume to Capacity	0.09	0.37	0.34	0.01	0.17	0.19
Queue Length 95th (m)	2.3	13.4	0.0	0.0	4.8	0.0
Control Delay (s)	30.2	16.0	0.0	0.0	9.5	0.0
Lane LOS	D	C			A	
Approach Delay (s)	17.0		0.0		3.1	
Approach LOS	C					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	16	691	8	13	647
Future Volume (Veh/h)	3	16	691	8	13	647
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	17	727	8	14	681
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	1440	731			735	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1440	731			735	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	96			98	
cM capacity (veh/h)	145	425			835	

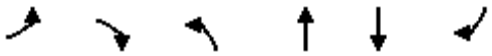
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	20	735	695
Volume Left	3	0	14
Volume Right	17	8	0
cSH	330	1700	835
Volume to Capacity	0.06	0.43	0.02
Queue Length 95th (m)	1.5	0.0	0.4
Control Delay (s)	16.6	0.0	0.4
Lane LOS	C		A
Approach Delay (s)	16.6	0.0	0.4
Approach LOS	C		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	14	128	4	16	67	26	0	5	14	18	7	3
Future Volume (Veh/h)	14	128	4	16	67	26	0	5	14	18	7	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	15	133	4	17	70	27	0	5	15	19	7	3
Pedestrians		1			1			1				
Lane Width (m)		3.2			3.2			3.4				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	97			138			291	297	137	301	286	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97			138			291	297	137	301	286	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	99	98	97	99	100
cM capacity (veh/h)	1509			1457			645	604	915	629	613	979

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	152	114	20	29
Volume Left	15	17	0	19
Volume Right	4	27	15	3
cSH	1509	1457	811	649
Volume to Capacity	0.01	0.01	0.02	0.04
Queue Length 95th (m)	0.2	0.3	0.6	1.1
Control Delay (s)	0.8	1.2	9.6	10.8
Lane LOS	A	A	A	B
Approach Delay (s)	0.8	1.2	9.6	10.8
Approach LOS			A	B

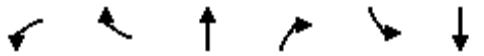
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	26.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	154	99	457	647	9
Future Volume (Veh/h)	7	154	99	457	647	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	7	164	105	486	688	10
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	1384	688	698			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1384	688	698			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	64	88			
cM capacity (veh/h)	141	450	898			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	164	105	486	688	10
Volume Left	7	0	105	0	0	0
Volume Right	0	164	0	0	0	10
cSH	141	450	898	1700	1700	1700
Volume to Capacity	0.05	0.36	0.12	0.29	0.40	0.01
Queue Length 95th (m)	1.2	13.2	3.2	0.0	0.0	0.0
Control Delay (s)	31.8	17.5	9.5	0.0	0.0	0.0
Lane LOS	D	C	A			
Approach Delay (s)	18.1		1.7		0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	164	392	33	275	526
Future Volume (Veh/h)	9	164	392	33	275	526
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	174	417	35	293	560
Pedestrians	1					
Lane Width (m)	4.7					
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	1564	418			453	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1564	418			453	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	88	73			74	
cM capacity (veh/h)	85	636			1117	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	10	174	417	35	293	560
Volume Left	10	0	0	0	293	0
Volume Right	0	174	0	35	0	0
cSH	85	636	1700	1700	1117	1700
Volume to Capacity	0.12	0.27	0.25	0.02	0.26	0.33
Queue Length 95th (m)	3.1	8.9	0.0	0.0	8.4	0.0
Control Delay (s)	53.0	12.8	0.0	0.0	9.4	0.0
Lane LOS	F	B			A	
Approach Delay (s)	15.0		0.0		3.2	
Approach LOS	B					

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	95	629	14	38	633
Future Volume (Veh/h)	46	95	629	14	38	633
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	53	109	723	16	44	728
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	1547	731			739	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1547	731			739	
tC, single (s)	6.7	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.2	
p0 queue free %	48	74			95	
cM capacity (veh/h)	101	425			876	

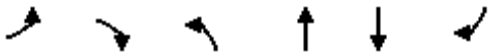
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	162	739	772
Volume Left	53	0	44
Volume Right	109	16	0
cSH	208	1700	876
Volume to Capacity	0.78	0.43	0.05
Queue Length 95th (m)	43.5	0.0	1.3
Control Delay (s)	65.1	0.0	1.3
Lane LOS	F		A
Approach Delay (s)	65.1	0.0	1.3
Approach LOS	F		

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	3	71	17	43	79	12	41	3	132	27	3	5
Future Volume (Veh/h)	3	71	17	43	79	12	41	3	132	27	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	4	88	21	53	98	15	51	4	163	33	4	6
Pedestrians											7	
Lane Width (m)											4.2	
Walking Speed (m/s)											1.2	
Percent Blockage											1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	120			109			326	332	98	490	336	112
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120			109			326	332	98	490	336	112
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			91	99	83	91	99	99
cM capacity (veh/h)	1470			1494			599	561	957	383	562	939

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	113	166	218	43
Volume Left	4	53	51	33
Volume Right	21	15	163	6
cSH	1470	1494	830	431
Volume to Capacity	0.00	0.04	0.26	0.10
Queue Length 95th (m)	0.1	0.9	8.4	2.6
Control Delay (s)	0.3	2.6	10.9	14.3
Lane LOS	A	A	B	B
Approach Delay (s)	0.3	2.6	10.9	14.3
Approach LOS			B	B

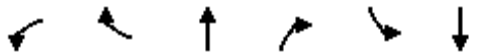
Intersection Summary				
Average Delay	6.4			
Intersection Capacity Utilization	34.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	158	106	662	361	27
Future Volume (Veh/h)	73	158	106	662	361	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	84	182	122	761	415	31
Pedestrians	3					
Lane Width (m)	4.2					
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	1423	418	449			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1423	418	449			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	34	70	89			
cM capacity (veh/h)	127	614	1108			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	84	182	122	761	415	31
Volume Left	84	0	122	0	0	0
Volume Right	0	182	0	0	0	31
cSH	127	614	1108	1700	1700	1700
Volume to Capacity	0.66	0.30	0.11	0.45	0.24	0.02
Queue Length 95th (m)	28.3	9.9	3.0	0.0	0.0	0.0
Control Delay (s)	76.6	13.3	8.7	0.0	0.0	0.0
Lane LOS	F	B	A			
Approach Delay (s)	33.3		1.2		0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	175	592	50	172	343
Future Volume (Veh/h)	25	175	592	50	172	343
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	28	199	673	57	195	390
Pedestrians	3					
Lane Width (m)	4.7					
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	1456	676			733	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1456	676			733	
tC, single (s)	6.5	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	73	56			77	
cM capacity (veh/h)	105	448			851	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	28	199	673	57	195	390
Volume Left	28	0	0	0	195	0
Volume Right	0	199	0	57	0	0
cSH	105	448	1700	1700	851	1700
Volume to Capacity	0.27	0.44	0.40	0.03	0.23	0.23
Queue Length 95th (m)	7.9	17.9	0.0	0.0	7.1	0.0
Control Delay (s)	51.4	19.3	0.0	0.0	10.5	0.0
Lane LOS	F	C			B	
Approach Delay (s)	23.2		0.0		3.5	
Approach LOS	C					

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Right Turn Channelized												
Traffic Volume (veh/h)	374	324	15	121	251	11	5	314	418	9	197	128
Future Volume (veh/h)	374	324	15	121	251	11	5	314	418	9	197	128
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	398	345	16	129	267	12	5	334	445	10	210	136
Approach Volume (veh/h)		759			408			784			356	
Crossing Volume (veh/h)		468			618			406			748	
High Capacity (veh/h)		958			849			1006			765	
High v/c (veh/h)		0.79			0.48			0.78			0.47	
Low Capacity (veh/h)		776			680			819			606	
Low v/c (veh/h)		0.98			0.60			0.96			0.59	

Intersection Summary				
Maximum v/c High	0.79			
Maximum v/c Low	0.98			
Intersection Capacity Utilization	112.5%	ICU Level of Service	H	

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	85	0	85	45	0	68	28	9	15	22	12	28
Future Volume (Veh/h)	85	0	85	45	0	68	28	9	15	22	12	28
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)	92	0	92	49	0	74	30	10	16	24	13	30
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	220	162	28	231	169	18	43			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220	162	28	231	169	18	43			26		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	91	92	100	93	98			98		
cM capacity (veh/h)	667	706	1047	643	699	1061	1566			1588		

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2	SW 1	SW 2
Volume Total	92	92	49	74	30	26	24	43
Volume Left	92	0	49	0	30	0	24	0
Volume Right	0	92	0	74	0	16	0	30
cSH	667	1047	643	1061	1566	1700	1588	1700
Volume to Capacity	0.14	0.09	0.08	0.07	0.02	0.02	0.02	0.03
Queue Length 95th (m)	3.8	2.3	2.0	1.8	0.5	0.0	0.4	0.0
Control Delay (s)	11.3	8.8	11.1	8.6	7.3	0.0	7.3	0.0
Lane LOS	B	A	B	A	A		A	
Approach Delay (s)	10.0		9.6		3.9		2.6	
Approach LOS	B		A					

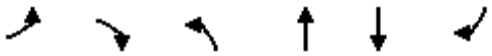
Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	27.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	30	650	552	29	88	91
Future Volume (Veh/h)	30	650	552	29	88	91
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)	33	707	600	32	96	99
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	632				1373	600
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	632				1373	600
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				38	80
cM capacity (veh/h)	951				155	501

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	SW 1	SW 2
Volume Total	33	707	600	32	96	99
Volume Left	33	0	0	0	96	0
Volume Right	0	0	0	32	0	99
cSH	951	1700	1700	1700	155	501
Volume to Capacity	0.03	0.42	0.35	0.02	0.62	0.20
Queue Length 95th (m)	0.9	0.0	0.0	0.0	26.8	5.8
Control Delay (s)	8.9	0.0	0.0	0.0	60.0	13.9
Lane LOS	A				F	B
Approach Delay (s)	0.4		0.0		36.6	
Approach LOS					E	

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	122	128	43	415	254	40
Future Volume (Veh/h)	122	128	43	415	254	40
Sign Control	Stop			Free	Free	
Grade	-6%			3%	-3%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	139	47	451	276	43
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	821	276	319			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	821	276	319			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	60	82	96			
cM capacity (veh/h)	332	763	1241			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	133	139	47	451	276	43
Volume Left	133	0	47	0	0	0
Volume Right	0	139	0	0	0	43
cSH	332	763	1241	1700	1700	1700
Volume to Capacity	0.40	0.18	0.04	0.27	0.16	0.03
Queue Length 95th (m)	14.9	5.3	0.9	0.0	0.0	0.0
Control Delay (s)	22.9	10.8	8.0	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	16.7		0.8		0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	70	748	53	106	744
Future Volume (Veh/h)	29	70	748	53	106	744
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	74	787	56	112	783
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	1822	815			843	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1822	815			843	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	58	81			85	
cM capacity (veh/h)	73	381			760	

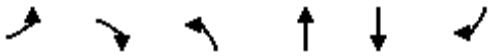
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	105	843	895
Volume Left	31	0	112
Volume Right	74	56	0
cSH	170	1700	760
Volume to Capacity	0.62	0.50	0.15
Queue Length 95th (m)	27.3	0.0	4.1
Control Delay (s)	55.3	0.0	3.8
Lane LOS	F		A
Approach Delay (s)	55.3	0.0	3.8
Approach LOS	F		

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	118.1%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	14	128	42	141	67	26	22	5	88	18	7	3
Future Volume (Veh/h)	14	128	42	141	67	26	22	5	88	18	7	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	15	133	44	147	70	27	23	5	92	19	7	3
Pedestrians		1			1			1				
Lane Width (m)		3.2			3.2			3.4				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	97			178			571	577	157	658	586	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97			178			571	577	157	658	586	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			90			94	99	90	94	98	100
cM capacity (veh/h)	1509			1409			389	381	892	308	377	979

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	192	244	120	29
Volume Left	15	147	23	19
Volume Right	44	27	92	3
cSH	1509	1409	685	348
Volume to Capacity	0.01	0.10	0.18	0.08
Queue Length 95th (m)	0.2	2.8	5.1	2.2
Control Delay (s)	0.7	5.1	11.4	16.3
Lane LOS	A	A	B	C
Approach Delay (s)	0.7	5.1	11.4	16.3
Approach LOS			B	C

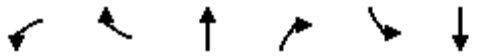
Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	189	159	508	734	74
Future Volume (Veh/h)	45	189	159	508	734	74
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	48	201	169	540	781	79
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	1659	781	860			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1659	781	860			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	44	49	78			
cM capacity (veh/h)	85	398	781			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	48	201	169	540	781	79
Volume Left	48	0	169	0	0	0
Volume Right	0	201	0	0	0	79
cSH	85	398	781	1700	1700	1700
Volume to Capacity	0.56	0.51	0.22	0.32	0.46	0.05
Queue Length 95th (m)	20.1	22.0	6.6	0.0	0.0	0.0
Control Delay (s)	92.0	22.9	10.9	0.0	0.0	0.0
Lane LOS	F	C	B			
Approach Delay (s)	36.2		2.6		0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	53	197	470	58	294	629
Future Volume (Veh/h)	53	197	470	58	294	629
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	56	210	500	62	313	669
Pedestrians	1					
Lane Width (m)	4.7					
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	1796	501			563	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1796	501			563	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	2	63			69	
cM capacity (veh/h)	57	571			1017	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	56	210	500	62	313	669
Volume Left	56	0	0	0	313	0
Volume Right	0	210	0	62	0	0
cSH	57	571	1700	1700	1017	1700
Volume to Capacity	0.98	0.37	0.29	0.04	0.31	0.39
Queue Length 95th (m)	36.2	13.4	0.0	0.0	10.5	0.0
Control Delay (s)	232.4	14.9	0.0	0.0	10.1	0.0
Lane LOS	F	B			B	
Approach Delay (s)	60.7		0.0		3.2	
Approach LOS	F					

Intersection Summary			
Average Delay	10.7		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Right Turn Channelized												
Traffic Volume (veh/h)	462	300	41	191	395	5	7	295	395	1	372	169
Future Volume (veh/h)	462	300	41	191	395	5	7	295	395	1	372	169
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	497	323	44	205	425	5	8	317	425	1	400	182
Approach Volume (veh/h)		864			635			750			583	
Crossing Volume (veh/h)		530			898			631			828	
High Capacity (veh/h)		911			677			840			716	
High v/c (veh/h)		0.95			0.94			0.89			0.81	
Low Capacity (veh/h)		735			529			672			564	
Low v/c (veh/h)		1.18			1.20			1.12			1.03	

Intersection Summary				
Maximum v/c High	0.95			
Maximum v/c Low	1.20			
Intersection Capacity Utilization	130.6%	ICU Level of Service	H	

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	53	0	53	28	0	43	91	21	48	53	0	53
Future Volume (Veh/h)	53	0	53	28	0	43	91	21	48	53	0	53
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)	58	0	58	30	0	47	99	23	52	58	0	58
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	413	418	29	421	421	49	58			75		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	413	418	29	421	421	49	58			75		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	94	94	100	95	94			96		
cM capacity (veh/h)	484	473	1046	474	472	1020	1546			1524		

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2	SW 1	SW 2
Volume Total	58	58	30	47	99	75	58	58
Volume Left	58	0	30	0	99	0	58	0
Volume Right	0	58	0	47	0	52	0	58
cSH	484	1046	474	1020	1546	1700	1524	1700
Volume to Capacity	0.12	0.06	0.06	0.05	0.06	0.04	0.04	0.03
Queue Length 95th (m)	3.2	1.4	1.6	1.2	1.6	0.0	0.9	0.0
Control Delay (s)	13.4	8.6	13.1	8.7	7.5	0.0	7.5	0.0
Lane LOS	B	A	B	A	A		A	
Approach Delay (s)	11.0		10.4		4.3		3.7	
Approach LOS	B		B					

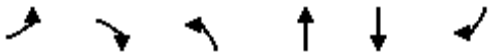
Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	29.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	97	676	744	94	55	57
Future Volume (Veh/h)	97	676	744	94	55	57
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)	105	735	809	102	60	62
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	911				1754	809
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	911				1754	809
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				26	84
cM capacity (veh/h)	748				81	380

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	SW 1	SW 2
Volume Total	105	735	809	102	60	62
Volume Left	105	0	0	0	60	0
Volume Right	0	0	0	102	0	62
cSH	748	1700	1700	1700	81	380
Volume to Capacity	0.14	0.43	0.48	0.06	0.74	0.16
Queue Length 95th (m)	3.9	0.0	0.0	0.0	29.0	4.6
Control Delay (s)	10.6	0.0	0.0	0.0	127.5	16.3
Lane LOS	B				F	C
Approach Delay (s)	1.3		0.0		71.0	
Approach LOS					F	

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	77	81	138	338	510	131
Future Volume (Veh/h)	77	81	138	338	510	131
Sign Control	Stop			Free	Free	
Grade	-6%			3%	-3%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	84	88	150	367	554	142
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	1221	554	696			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1221	554	696			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	49	83	83			
cM capacity (veh/h)	166	532	900			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	84	88	150	367	554	142
Volume Left	84	0	150	0	0	0
Volume Right	0	88	0	0	0	142
cSH	166	532	900	1700	1700	1700
Volume to Capacity	0.51	0.17	0.17	0.22	0.33	0.08
Queue Length 95th (m)	19.8	4.7	4.8	0.0	0.0	0.0
Control Delay (s)	47.0	13.1	9.8	0.0	0.0	0.0
Lane LOS	E	B	A			
Approach Delay (s)	29.6		2.8		0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

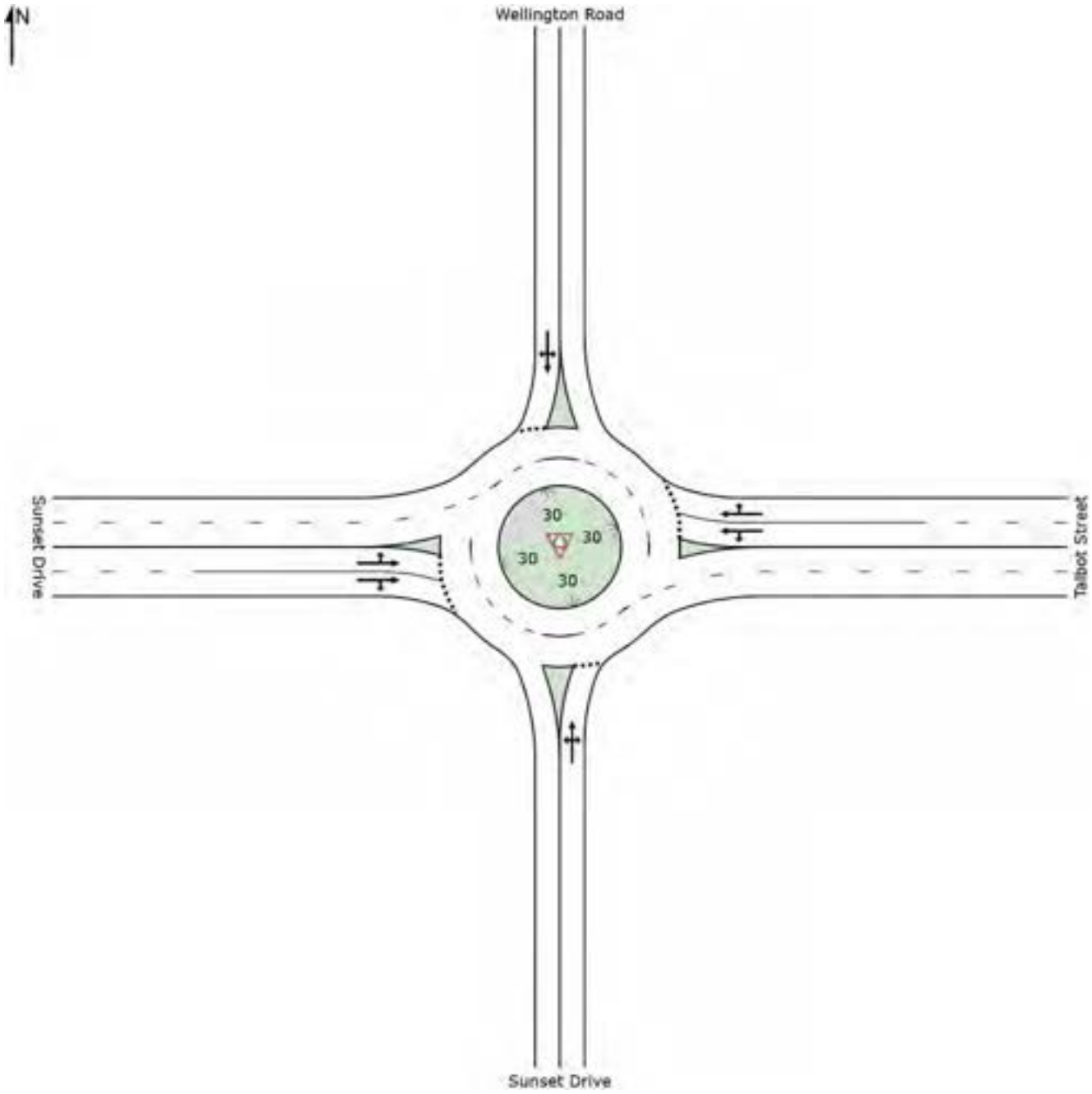
Appendix E

Sidra Analysis Worksheets

SITE LAYOUT

Site: [Existing AM]

Wellington Road and Talbot Street
Roundabout



MOVEMENT SUMMARY

Site: [Existing AM]

Wellington Road and Talbot Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	257	2.0	0.452	10.5	LOS B	2.8	20.0	0.47	0.60	54.6
2	T1	244	4.0	0.452	4.9	LOS A	2.8	20.0	0.47	0.60	54.2
3	R2	12	9.0	0.452	4.9	LOS A	2.8	20.0	0.47	0.60	52.5
Approach		513	3.1	0.452	7.7	LOS A	2.8	20.0	0.47	0.60	54.3
East: Talbot Street											
4	L2	7	29.0	0.108	12.1	LOS B	0.5	4.0	0.55	0.58	54.6
5	T1	127	3.0	0.108	5.6	LOS A	0.6	4.1	0.55	0.58	55.4
6	R2	77	3.0	0.108	5.5	LOS A	0.6	4.1	0.55	0.58	54.0
Approach		212	3.9	0.108	5.8	LOS A	0.6	4.1	0.55	0.58	54.9
North: Wellington Road											
7	L2	23	5.0	0.178	10.9	LOS B	0.8	5.8	0.46	0.55	55.7
8	T1	140	5.0	0.178	5.2	LOS A	0.8	5.8	0.46	0.55	55.4
9	R2	8	13.0	0.178	5.3	LOS A	0.8	5.8	0.46	0.55	53.5
Approach		172	5.4	0.178	6.0	LOS A	0.8	5.8	0.46	0.55	55.3
West: Sunset Drive											
10	L2	4	25.0	0.165	10.3	LOS B	0.8	5.7	0.33	0.42	56.1
11	T1	195	2.0	0.165	4.2	LOS A	0.8	5.7	0.33	0.42	56.6
12	R2	234	6.0	0.179	4.3	LOS A	0.9	6.5	0.32	0.48	55.0
Approach		433	4.4	0.179	4.3	LOS A	0.9	6.5	0.32	0.45	55.7
All Vehicles		1328	3.9	0.452	6.1	LOS A	2.8	20.0	0.44	0.54	55.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [Existing PM]

Wellington Road and Talbot Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	254	4.0	0.452	11.1	LOS B	2.8	20.1	0.55	0.66	54.0
2	T1	176	7.0	0.452	5.5	LOS A	2.8	20.1	0.55	0.66	53.7
3	R2	33	0.0	0.452	5.2	LOS A	2.8	20.1	0.55	0.66	52.3
Approach		462	4.9	0.452	8.6	LOS A	2.8	20.1	0.55	0.66	53.8
East: Talbot Street											
4	L2	1	100.0	0.146	13.3	LOS B	0.8	5.5	0.53	0.54	54.1
5	T1	245	3.0	0.146	5.3	LOS A	0.8	5.7	0.53	0.54	55.6
6	R2	54	4.0	0.146	5.3	LOS A	0.8	5.7	0.53	0.53	53.9
Approach		300	3.5	0.146	5.3	LOS A	0.8	5.7	0.53	0.54	55.3
North: Wellington Road											
7	L2	106	1.0	0.421	11.6	LOS B	2.2	15.8	0.59	0.67	54.7
8	T1	281	3.0	0.421	6.0	LOS A	2.2	15.8	0.59	0.67	54.3
9	R2	4	0.0	0.421	5.8	LOS A	2.2	15.8	0.59	0.67	52.8
Approach		392	2.4	0.421	7.5	LOS A	2.2	15.8	0.59	0.67	54.4
West: Sunset Drive											
10	L2	5	0.0	0.203	10.9	LOS B	1.1	7.8	0.52	0.52	55.9
11	T1	198	2.0	0.203	5.2	LOS A	1.1	7.8	0.52	0.52	55.5
12	R2	247	1.0	0.216	5.1	LOS A	1.2	8.6	0.52	0.59	54.4
Approach		451	1.4	0.216	5.2	LOS A	1.2	8.6	0.52	0.56	54.9
All Vehicles		1604	3.1	0.452	6.8	LOS A	2.8	20.1	0.55	0.61	54.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [FB AM]

Wellington Road and Talbot Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	356	2.0	0.672	13.0	LOS B	6.3	45.1	0.72	0.82	53.0
2	T1	317	4.0	0.672	7.4	LOS A	6.3	45.1	0.72	0.82	52.7
3	R2	16	9.0	0.672	7.4	LOS A	6.3	45.1	0.72	0.82	51.1
Approach		688	3.1	0.672	10.3	LOS B	6.3	45.1	0.72	0.82	52.8
East: Talbot Street											
4	L2	9	29.0	0.200	13.7	LOS B	1.2	8.7	0.73	0.71	53.7
5	T1	200	3.0	0.200	6.9	LOS A	1.3	9.3	0.73	0.71	54.5
6	R2	105	3.0	0.200	6.7	LOS A	1.3	9.3	0.73	0.70	53.2
Approach		315	3.8	0.200	7.0	LOS A	1.3	9.3	0.73	0.70	54.1
North: Wellington Road											
7	L2	36	5.0	0.283	11.8	LOS B	1.4	10.4	0.60	0.64	54.9
8	T1	193	5.0	0.283	6.1	LOS A	1.4	10.4	0.60	0.64	54.7
9	R2	12	13.0	0.283	6.2	LOS A	1.4	10.4	0.60	0.64	52.8
Approach		240	5.4	0.283	6.9	LOS A	1.4	10.4	0.60	0.64	54.6
West: Sunset Drive											
10	L2	5	25.0	0.267	10.7	LOS B	1.5	10.5	0.43	0.46	55.5
11	T1	309	2.0	0.267	4.6	LOS A	1.5	11.1	0.43	0.46	56.0
12	R2	324	6.0	0.267	4.6	LOS A	1.5	11.1	0.42	0.53	54.6
Approach		639	4.2	0.267	4.7	LOS A	1.5	11.1	0.43	0.49	55.3
All Vehicles		1882	3.9	0.672	7.4	LOS A	6.3	45.1	0.61	0.67	54.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [FB PM]

Wellington Road and Talbot Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	352	4.0	0.693	14.7	LOS B	6.9	50.3	0.80	0.93	52.0
2	T1	240	7.0	0.693	9.1	LOS A	6.9	50.3	0.80	0.93	51.7
3	R2	43	0.0	0.693	8.7	LOS A	6.9	50.3	0.80	0.93	50.3
Approach		635	4.9	0.693	12.1	LOS B	6.9	50.3	0.80	0.93	51.7
East: Talbot Street											
4	L2	1	100.0	0.267	15.4	LOS B	1.7	11.9	0.72	0.66	53.2
5	T1	368	3.0	0.267	6.5	LOS A	1.8	12.8	0.72	0.66	54.6
6	R2	80	4.0	0.267	6.4	LOS A	1.8	12.8	0.72	0.65	53.0
Approach		449	3.4	0.267	6.5	LOS A	1.8	12.8	0.72	0.65	54.3
North: Wellington Road											
7	L2	143	1.0	0.646	15.1	LOS B	5.1	36.3	0.80	0.99	52.8
8	T1	371	3.0	0.646	9.5	LOS A	5.1	36.3	0.80	0.99	52.4
9	R2	5	0.0	0.646	9.3	LOS A	5.1	36.3	0.80	0.99	51.0
Approach		519	2.4	0.646	11.1	LOS B	5.1	36.3	0.80	0.99	52.5
West: Sunset Drive											
10	L2	7	0.0	0.345	11.8	LOS B	2.2	15.7	0.69	0.62	55.0
11	T1	297	2.0	0.345	6.2	LOS A	2.3	16.5	0.69	0.62	54.6
12	R2	343	1.0	0.345	5.9	LOS A	2.3	16.5	0.69	0.70	53.8
Approach		647	1.4	0.345	6.1	LOS A	2.3	16.5	0.69	0.66	54.2
All Vehicles		2251	3.0	0.693	9.0	LOS A	6.9	50.3	0.75	0.81	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: [TF AM]

Wellington Road and Talbot Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	394	2.0	0.823	18.9	LOS B	12.1	86.9	0.95	1.11	49.3
2	T1	341	4.0	0.823	13.3	LOS B	12.1	86.9	0.95	1.11	49.0
3	R2	16	9.0	0.823	13.4	LOS B	12.1	86.9	0.95	1.11	47.6
Approach		751	3.1	0.823	16.2	LOS B	12.1	86.9	0.95	1.11	49.1
East: Talbot Street											
4	L2	9	29.0	0.258	14.4	LOS B	1.7	12.4	0.82	0.77	53.2
5	T1	207	3.0	0.258	7.5	LOS A	1.9	13.4	0.82	0.77	54.1
6	R2	135	3.0	0.258	7.2	LOS A	1.9	13.4	0.83	0.77	52.9
Approach		352	3.7	0.258	7.6	LOS A	1.9	13.4	0.83	0.77	53.6
North: Wellington Road											
7	L2	127	5.0	0.506	13.3	LOS B	3.4	25.1	0.74	0.84	53.5
8	T1	264	5.0	0.506	7.6	LOS A	3.4	25.1	0.74	0.84	53.2
9	R2	12	13.0	0.506	7.8	LOS A	3.4	25.1	0.74	0.84	51.5
Approach		403	5.2	0.506	9.4	LOS A	3.4	25.1	0.74	0.84	53.3
West: Sunset Drive											
10	L2	5	25.0	0.352	11.9	LOS B	2.2	15.4	0.61	0.56	54.5
11	T1	331	2.0	0.352	5.6	LOS A	2.2	15.4	0.61	0.56	55.0
12	R2	440	6.0	0.407	5.6	LOS A	2.7	20.1	0.63	0.67	53.9
Approach		776	4.4	0.407	5.6	LOS A	2.7	20.1	0.62	0.62	54.4
All Vehicles		2281	4.0	0.823	10.1	LOS B	12.1	86.9	0.78	0.84	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [TF PM]

Wellington Road and Talbot Street
Roundabout

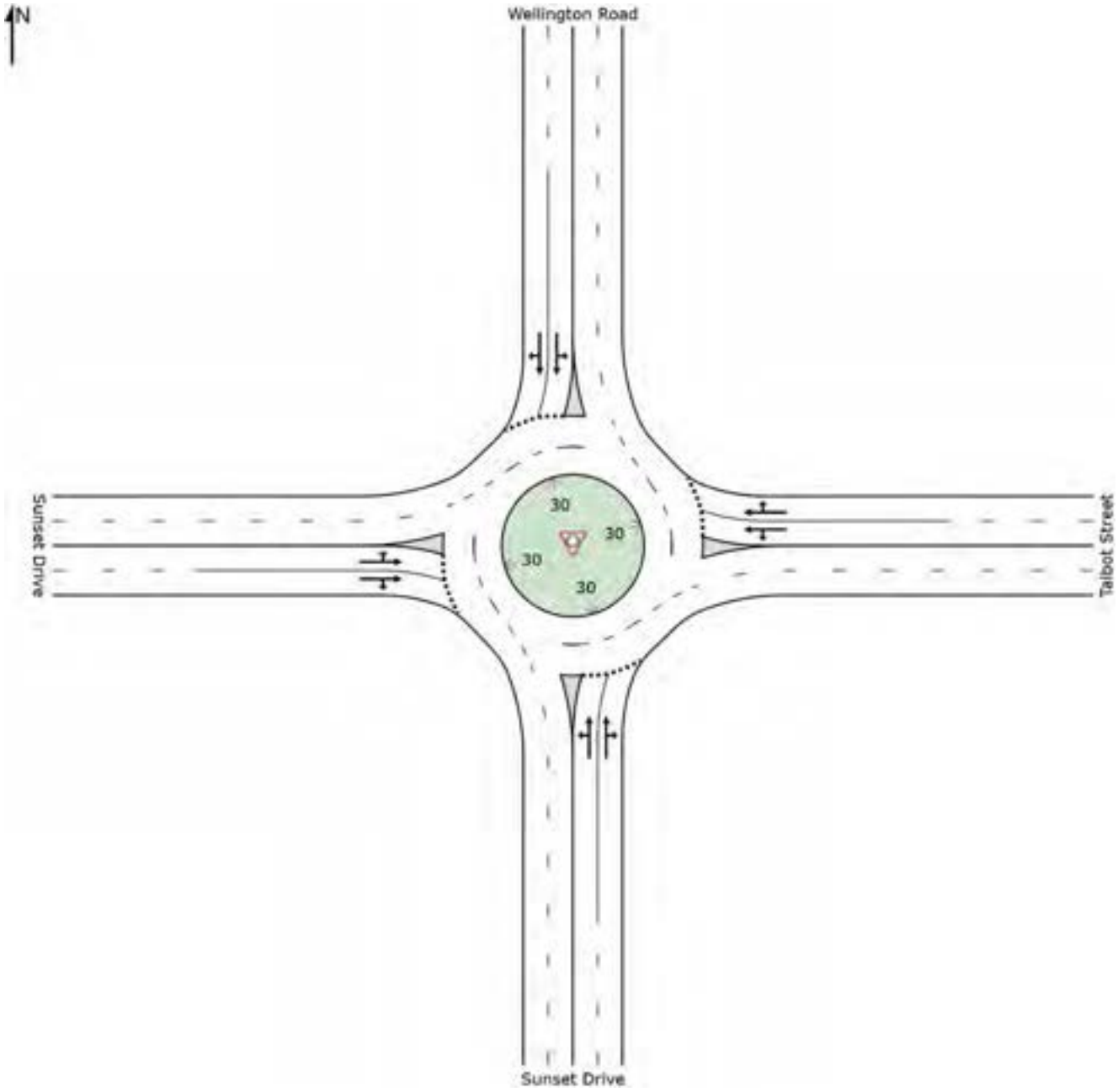
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	486	4.0	0.987	45.6	LOS D	33.6	245.4	1.00	1.87	36.5
2	T1	316	7.0	0.987	40.1	LOS D	33.6	245.4	1.00	1.87	36.4
3	R2	43	0.0	0.987	39.6	LOS D	33.6	245.4	1.00	1.87	35.7
Approach		845	4.9	0.987	43.2	LOS D	33.6	245.4	1.00	1.87	36.4
East: Talbot Street											
4	L2	1	100.0	0.478	20.5	LOS C	3.8	27.7	0.94	1.00	51.5
5	T1	392	3.0	0.478	10.1	LOS B	4.2	30.1	0.95	0.99	53.0
6	R2	178	4.0	0.478	9.5	LOS A	4.2	30.1	0.96	0.96	51.6
Approach		571	3.5	0.478	10.0	LOS A	4.2	30.1	0.95	0.98	52.6
North: Wellington Road											
7	L2	201	1.0	0.919	31.7	LOS C	15.4	110.0	1.00	1.50	42.8
8	T1	416	3.0	0.919	26.1	LOS C	15.4	110.0	1.00	1.50	42.5
9	R2	5	0.0	0.919	25.9	LOS C	15.4	110.0	1.00	1.50	41.6
Approach		622	2.3	0.919	27.9	LOS C	15.4	110.0	1.00	1.50	42.6
West: Sunset Drive											
10	L2	7	0.0	0.438	13.1	LOS B	3.2	22.8	0.82	0.75	54.3
11	T1	311	2.0	0.438	7.5	LOS A	3.2	22.8	0.82	0.75	53.9
12	R2	416	1.0	0.479	7.2	LOS A	3.9	27.9	0.85	0.84	53.2
Approach		734	1.4	0.479	7.3	LOS A	3.9	27.9	0.84	0.80	53.5
All Vehicles		2772	3.1	0.987	23.4	LOS C	33.6	245.4	0.95	1.32	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [TF AM (Mitigation)]

Wellington Road and Talbot Street
Roundabout



MOVEMENT SUMMARY

Site: [TF AM (Mitigation)]

Wellington Road and Talbot Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	394	2.0	0.364	11.3	LOS B	2.2	15.9	0.60	0.75	52.2
2	T1	341	4.0	0.364	6.0	LOS A	2.2	15.9	0.61	0.60	55.0
3	R2	16	9.0	0.364	6.3	LOS A	2.1	15.4	0.61	0.60	53.2
Approach		751	3.1	0.364	8.8	LOS A	2.2	15.9	0.61	0.68	53.4
East: Talbot Street											
4	L2	9	29.0	0.195	12.4	LOS B	0.9	6.2	0.59	0.59	54.4
5	T1	207	3.0	0.195	5.7	LOS A	0.9	6.5	0.59	0.60	55.2
6	R2	135	3.0	0.195	5.4	LOS A	0.9	6.5	0.58	0.61	53.9
Approach		352	3.7	0.195	5.8	LOS A	0.9	6.5	0.59	0.60	54.7
North: Wellington Road											
7	L2	127	5.0	0.212	11.7	LOS B	1.0	7.5	0.58	0.74	53.3
8	T1	264	5.0	0.212	5.7	LOS A	1.1	7.9	0.58	0.60	54.8
9	R2	12	13.0	0.212	5.9	LOS A	1.1	7.9	0.57	0.56	53.3
Approach		403	5.2	0.212	7.6	LOS A	1.1	7.9	0.58	0.64	54.2
West: Sunset Drive											
10	L2	5	25.0	0.333	11.4	LOS B	1.6	11.7	0.52	0.51	55.0
11	T1	331	2.0	0.333	5.1	LOS A	1.6	11.7	0.52	0.51	55.5
12	R2	440	6.0	0.384	5.1	LOS A	2.0	14.9	0.53	0.60	54.2
Approach		776	4.4	0.384	5.1	LOS A	2.0	14.9	0.53	0.56	54.8
All Vehicles		2281	4.0	0.384	6.9	LOS A	2.2	15.9	0.57	0.62	54.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [TF PM (Mitigation)]

Wellington Road and Talbot Street
Roundabout

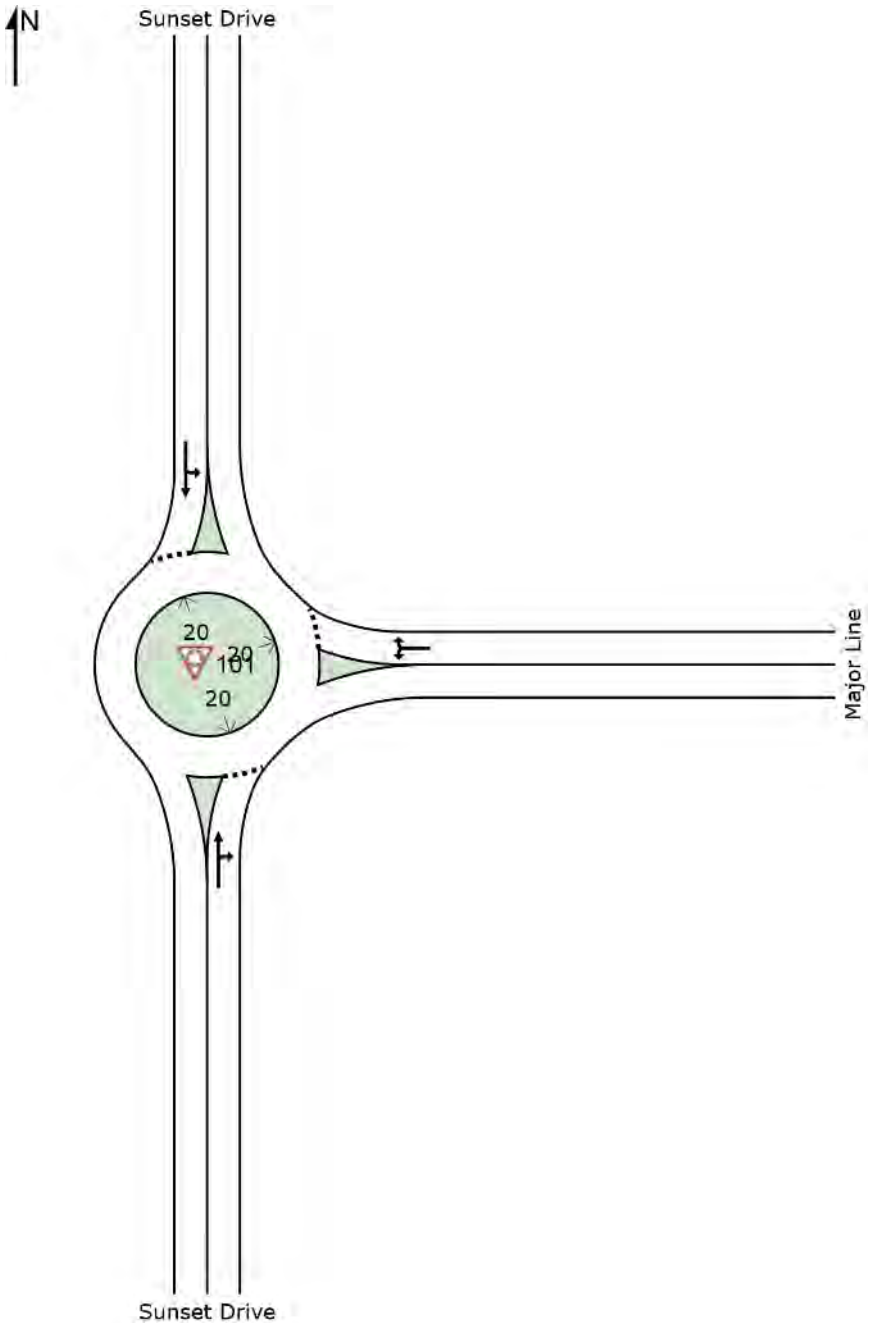
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
1	L2	486	4.0	0.462	11.9	LOS B	3.1	22.6	0.68	0.79	51.8
2	T1	316	7.0	0.408	6.6	LOS A	2.5	18.1	0.67	0.66	54.8
3	R2	43	0.0	0.408	6.5	LOS A	2.5	18.1	0.67	0.66	53.2
Approach		845	4.9	0.462	9.7	LOS A	3.1	22.6	0.68	0.74	52.9
East: Talbot Street											
4	L2	1	100.0	0.336	15.9	LOS B	1.7	12.0	0.68	0.63	53.3
5	T1	392	3.0	0.336	6.2	LOS A	1.8	12.7	0.68	0.64	54.9
6	R2	178	4.0	0.336	5.9	LOS A	1.8	12.7	0.67	0.65	53.4
Approach		571	3.5	0.336	6.2	LOS A	1.8	12.7	0.68	0.64	54.4
North: Wellington Road											
7	L2	201	1.0	0.379	13.4	LOS B	2.1	14.9	0.73	0.89	52.2
8	T1	416	3.0	0.379	7.0	LOS A	2.2	15.8	0.73	0.72	53.9
9	R2	5	0.0	0.379	6.9	LOS A	2.2	15.8	0.73	0.68	52.8
Approach		622	2.3	0.379	9.1	LOS A	2.2	15.8	0.73	0.77	53.4
West: Sunset Drive											
10	L2	7	0.0	0.366	11.4	LOS B	1.8	13.1	0.63	0.58	55.3
11	T1	311	2.0	0.366	5.8	LOS A	1.8	13.1	0.63	0.58	54.9
12	R2	416	1.0	0.398	5.4	LOS A	2.2	15.2	0.63	0.65	54.0
Approach		734	1.4	0.398	5.7	LOS A	2.2	15.2	0.63	0.62	54.4
All Vehicles		2772	3.1	0.462	7.8	LOS A	3.1	22.6	0.68	0.70	53.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Major Line & Sunset Drive - AM - Sidra]

Major Line & Sunset Drive
Roundabout



MOVEMENT SUMMARY

Site: 101 [Major Line & Sunset Drive - AM - Sidra]

Major Line & Sunset Drive
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
2	T1	662	4.0	0.445	4.4	LOS A	3.5	25.4	0.22	0.40	55.7
3	R2	15	0.0	0.445	4.1	LOS A	3.5	25.4	0.22	0.40	54.5
Approach		677	3.9	0.445	4.4	LOS A	3.5	25.4	0.22	0.40	55.7
East: Major Line											
4	L2	48	33.0	0.196	14.2	LOS B	1.1	8.7	0.70	0.77	51.3
6	R2	100	0.0	0.196	7.9	LOS A	1.1	8.7	0.70	0.77	51.4
Approach		148	10.8	0.196	10.0	LOS A	1.1	8.7	0.70	0.77	51.3
North: Sunset Drive											
7	L2	40	0.0	0.482	9.1	LOS A	4.4	32.0	0.31	0.42	55.2
8	T1	666	4.0	0.482	4.5	LOS A	4.4	32.0	0.31	0.42	55.1
Approach		706	3.8	0.482	4.8	LOS A	4.4	32.0	0.31	0.42	55.1
All Vehicles		1532	4.5	0.482	5.1	LOS A	4.4	32.0	0.31	0.45	55.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Major Line & Sunset Drive - PM - Sidra]

Major Line & Sunset Drive
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sunset Drive											
2	T1	787	2.0	0.617	5.1	LOS A	5.9	42.4	0.49	0.48	54.5
3	R2	56	17.0	0.617	5.2	LOS A	5.9	42.4	0.49	0.48	52.8
Approach		843	3.0	0.617	5.1	LOS A	5.9	42.4	0.49	0.48	54.4
East: Major Line											
4	L2	31	0.0	0.154	13.8	LOS B	1.0	6.9	0.79	0.79	51.9
6	R2	74	0.0	0.154	8.9	LOS A	1.0	6.9	0.79	0.79	50.8
Approach		104	0.0	0.154	10.3	LOS B	1.0	6.9	0.79	0.79	51.1
North: Sunset Drive											
7	L2	112	10.0	0.566	9.1	LOS A	6.3	45.2	0.26	0.42	54.8
8	T1	783	1.0	0.566	4.3	LOS A	6.3	45.2	0.26	0.42	55.3
Approach		895	2.1	0.566	4.9	LOS A	6.3	45.2	0.26	0.42	55.2
All Vehicles		1842	2.4	0.617	5.3	LOS A	6.3	45.2	0.39	0.47	54.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix F

Traffic Signal Warrants

Traffic Signal Warrant Analysis

MTO Method (Ontario Traffic Manual, Book 12)

Sunset Drive and Major Line Analysis date: 2019-09-19

Existing volumes

Main street direction: North/South
Main street cross-section: 1 lane
Roadway environment: Free flow
"T" intersection? Yes

	Movement	Hour ending: 8:00	9:00	10:00	11:00	14:00	15:00	16:00	17:00	
Volume data										
Major street	NB Left	0	0	0	0	0	0	0	0	
	NB Through	391	269	219	219	346	346	407	362	
	NB Right	1	1	3	3	3	3	7	1	
	SB Left	8	4	10	10	5	5	8	10	
	SB Through	313	372	238	238	309	309	425	374	
	SB Right	0	0	0	0	0	0	0	0	
Minor street	EB Left	0	0	0	0	0	0	0	0	
	EB Through	0	0	0	0	0	0	0	0	
	EB Right	0	0	0	0	0	0	0	0	
	WB Left	3	1	2	2	5	5	3	3	
	WB Through	0	0	0	0	0	0	0	0	
	WB Right	1	7	6	6	8	8	14	6	
	Crossing pedestrians	0	0	0	0	0	0	0	0	

	Minimum requirements (80% shown in brackets)		Hour ending: 8:00	9:00	10:00	11:00	14:00	15:00	16:00	17:00	Sectional percent
Justification 1: Minimum Vehicle Volume											
a) All approach lanes	480	(385)	717	654	478	478	676	676	864	756	
		100% fulfilled:	100%	100%			100%	100%	100%	100%	
		80% fulfilled:			80%	80%					95%
		Actual % if below 80% value:									
b) Minor street (both approaches)	180	(145)	4	8	8	8	13	13	17	9	
		100% fulfilled:									
		80% fulfilled:									6%
		Actual % if below 80% value:	2%	4%	4%	4%	7%	7%	9%	5%	
Justification 2: Delay to Cross Traffic											
a) Major street (both approaches)	480	(385)	713	646	470	470	663	663	847	747	
		100% fulfilled:	100%	100%			100%	100%	100%	100%	
		80% fulfilled:			80%	80%					95%
		Actual % if below 80% value:									
b) Traffic crossing major street	50	(40)	3	1	2	2	5	5	3	3	
		100% fulfilled:									
		80% fulfilled:									6%
		Actual % if below 80% value:	6%	2%	4%	4%	10%	10%	6%	6%	

Justification	Description	Min. required	Compliance	
			Section	Entire
1) Minimum vehicular volume	a) Vehicle volume, all approaches for each of the heaviest 8 hours of an average day; and	480	95%	6%
	b) Vehicle volume, along minor streets for each of the same 8 hours	180	6%	
2) Delay to cross traffic	a) Vehicle volume, major street for each of the heaviest 8 hours of an average day; and	480	95%	6%
	b) Combined vehicle and pedestrian volume crossing the major street for each of the same 8 hours	50	6%	
3) Volume / delay combinations	The above justifcations (1 and 2) both satisfied to the extent of 80% or more	No		

Traffic Signal Warrant Analysis

MTO Method (Ontario Traffic Manual, Book 12)

Sunset Drive and Major Line Analysis date: 2019-09-19

Future background volumes

Main street direction: North/South
Main street cross-section: 1 lane
Roadway environment: Free flow
"T" intersection? Yes

	Movement	Hour ending: 8:00	9:00	10:00	11:00	14:00	15:00	16:00	17:00	
Volume data										
Major street	NB Left	0	0	0	0	0	0	0	0	
	NB Through	580	424	354	307	484	542	640	584	
	NB Right	1	1	4	4	4	4	10	1	
	SB Left	11	6	14	14	7	7	11	14	
	SB Through	510	594	385	333	433	488	650	581	
	SB Right	0	0	0	0	0	0	0	0	
Minor street	EB Left	0	0	0	0	0	0	0	0	
	EB Through	0	0	0	0	0	0	0	0	
	EB Right	0	0	0	0	0	0	0	0	
	WB Left	4	1	3	3	7	7	4	4	
	WB Through	0	0	0	0	0	0	0	0	
	WB Right	1	10	8	8	11	11	20	8	
	Crossing pedestrians	0	0	0	0	0	0	0	0	

	Minimum requirements (80% shown in brackets)		Hour ending: 8:00	9:00	10:00	11:00	14:00	15:00	16:00	17:00	Sectional percent
Justification 1: Minimum Vehicle Volume											
a) All approach lanes	480	(385)	1108	1036	769	669	946	1059	1335	1192	
		100% fulfilled:	100%	100%	100%	100%	100%	100%	100%	100%	
		80% fulfilled:									100%
		Actual % if below 80% value:									
b) Minor street (both approaches)	180	(145)	6	11	11	11	18	18	24	13	
		100% fulfilled:									
		80% fulfilled:									8%
		Actual % if below 80% value:	3%	6%	6%	6%	10%	10%	13%	7%	
Justification 2: Delay to Cross Traffic											
a) Major street (both approaches)	480	(385)	1103	1025	758	658	928	1041	1311	1180	
		100% fulfilled:	100%	100%	100%	100%	100%	100%	100%	100%	
		80% fulfilled:									100%
		Actual % if below 80% value:									
b) Traffic crossing major street	50	(40)	4	1	3	3	7	7	4	4	
		100% fulfilled:									
		80% fulfilled:									8%
		Actual % if below 80% value:	8%	3%	6%	6%	14%	14%	8%	8%	

Justification	Description	Min. required	Compliance	
			Section	Entire
1) Minimum vehicular volume	a) Vehicle volume, all approaches for each of the heaviest 8 hours of an average day; and	480	100%	8%
	b) Vehicle volume, along minor streets for each of the same 8 hours	180	8%	
2) Delay to cross traffic	a) Vehicle volume, major street for each of the heaviest 8 hours of an average day; and	480	100%	8%
	b) Combined vehicle and pedestrian volume crossing the major street for each of the same 8 hours	50	8%	
3) Volume / delay combinations	The above justifcations (1 and 2) both satisfied to the extent of 80% or more	No		

Traffic Signal Warrant Analysis

MTO Method (Ontario Traffic Manual, Book 12)

Sunset Drive and Major Line Analysis date: 2019-09-19

Total future volumes

Main street direction: North/South
Main street cross-section: 1 lane
Roadway environment: Free flow
"T" intersection? Yes

	Movement	Hour ending: 8:00	9:00	10:00	11:00	14:00	15:00	16:00	17:00	
Volume data										
Major street	NB Left	0	0	0	0	0	0	0	0	
	NB Through	635	507	437	398	519	585	691	641	
	NB Right	15	15	14	13	45	48	53	46	
	SB Left	40	35	35	32	91	97	101	107	
	SB Through	540	624	407	352	521	582	744	678	
	SB Right	0	0	0	0	0	0	0	0	
Minor street	EB Left	0	0	0	0	0	0	0	0	
	EB Through	0	0	0	0	0	0	0	0	
	EB Right	0	0	0	0	0	0	0	0	
	WB Left	30	39	41	45	23	27	29	31	
	WB Through	0	0	0	0	0	0	0	0	
	WB Right	54	88	87	95	44	52	70	63	
	Crossing pedestrians	0	0	0	0	0	0	0	0	

	Minimum requirements (80% shown in brackets)		Hour ending: 8:00	9:00	10:00	11:00	14:00	15:00	16:00	17:00	Sectional percent
Justification 1: Minimum Vehicle Volume											
a) All approach lanes	480	(385)	1315	1308	1020	935	1243	1391	1689	1566	
		100% fulfilled:	100%	100%	100%	100%	100%	100%	100%	100%	
		80% fulfilled:									100%
		Actual % if below 80% value:									
b) Minor street (both approaches)	180	(145)	84	128	128	140	68	80	98	95	
		100% fulfilled:									
		80% fulfilled:									57%
		Actual % if below 80% value:	47%	71%	71%	78%	38%	44%	55%	53%	
Justification 2: Delay to Cross Traffic											
a) Major street (both approaches)	480	(385)	1230	1180	892	795	1176	1312	1590	1472	
		100% fulfilled:	100%	100%	100%	100%	100%	100%	100%	100%	
		80% fulfilled:									100%
		Actual % if below 80% value:									
b) Traffic crossing major street	50	(40)	30	39	41	45	23	27	29	31	
		100% fulfilled:									
		80% fulfilled:			80%	80%					65%
		Actual % if below 80% value:	60%	79%			47%	55%	57%	62%	

Justification	Description	Min. required	Compliance	
			Section	Entire
1) Minimum vehicular volume	a) Vehicle volume, all approaches for each of the heaviest 8 hours of an average day; and	480	100%	57%
	b) Vehicle volume, along minor streets for each of the same 8 hours	180	57%	
2) Delay to cross traffic	a) Vehicle volume, major street for each of the heaviest 8 hours of an average day; and	480	100%	65%
	b) Combined vehicle and pedestrian volume crossing the major street for each of the same 8 hours	50	65%	
3) Volume / delay combinations	The above justifcations (1 and 2) both satisfied to the extent of 80% or more	No		

Traffic Signal Warrant Analysis

MTO Method (Ontario Traffic Manual, Book 12)
Justification 7

Analysis date: 2019-10-21

Welington Road and Proposed Site Access
Total Future Volumes

	Approach	AM	PM	Avg
Major, 1 lane	**North**	294	641	234
Major, 1 lane	**South**	458	476	234
Minor, 1 lane	**West**	250	158	102
	Total	1002	1275	569

Justification	Description	1 Lane		2 or more Lanes		Compliance		Entire %	Warranted? (Yes/No)
						Sectional			
		Free	Restr	Free	Restr	Numerical	%		150%
1 - Min Volumes	A - All Approaches	480	720	600	900	569	118.5%	56.7%	No
	B - Minor Streets	180	255	180	255	102	56.7%		
2 - Crossing Delays	A - Major Streets	480	720	600	900	468	97.5%	97.5%	No
	B - Crossing Volumes	50	75	50	75	102	204.0%		

Crossing Volumes (Minor) =	102
Crossing Volumes (Peds) =	0
Crossing Volumes (Addition) =	0
Crossing Volumes (Total) =	102

Peak	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBL
AM	122	0	128	0	0	0	43	415	0	0	254	40
PM	81	0	77	0	0	0	138	338	0	0	510	131
Average	101.5	0	102.5	0	0	0	90.5	376.5	0	0	382	85.5

Left Turn Volume =	90.5
Highest Left Turn Volume =	90.5
Total Opposing Volume =	467.5
Crossing Addition =	0

Traffic Signal Warrant Analysis

MTO Method (Ontario Traffic Manual, Book 12)
Justification 7

Analysis date: 2019-10-21

Sunset Drive and Proposed Site Access
Total Future Volumes

	Approach	AM	PM	Avg
Major, 1 lane	**North**	680	773	363
Major, 1 lane	**South**	581	838	355
Minor, 1 lane	**East**	179	112	73
	Total	1440	1723	791

Justification	Description	1 Lane		2 or more Lanes		Compliance		Warranted? (Yes/No)
						Sectional	Entire %	
		Free	Restr	Free	Restr	Numerical	%	150%
1 - Min Volumes	A - All Approaches	480	720	600	900	791	164.8%	40.6%	No
	B - Minor Streets	180	255	180	255	73	40.6%		
2 - Crossing Delays	A - Major Streets	480	720	600	900	718	149.6%	144.0%	No
	B - Crossing Volumes	50	75	50	75	72	144.0%		

Crossing Volumes (Minor) =	72
Crossing Volumes (Peds) =	0
Crossing Volumes (Addition) =	0
Crossing Volumes (Total) =	72

Peak	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBL
AM	0	0	0	88	0	91	0	552	29	30	650	0
PM	0	0	0	55	0	57	0	744	94	97	676	0
Average	0	0	0	71.5	0	74	0	648	61.5	63.5	663	0

Left Turn Volume =	63.5
Highest Left Turn Volume =	63.5
Total Opposing Volume =	709.5
Crossing Addition =	0

Appendix G

Hourly Variation in Trip Generation

HOURLY VARIATION IN TRIP GENERATION FOR OFFICE AND RESIDENTIAL LAND USES

By Aaron T. Zimmerman, PTP

Abstract

Following the development of *Trip Generation*, 8th Edition, a call for data was sent out to ITE members soliciting twenty-four hour trip generation data. In response, ITE members submitted hundreds of datasets for not only the land uses discussed in this article, but also for other land uses such as shopping centers, auto dealerships, golf courses, hotels, and daycare centers, among others. Due to the short time frame between completion of the initial data collection portion of this project and development of the most recent edition of *Trip Generation Manual*, twenty-four hour summaries for office and residential land uses were not included in the ninth edition.

This article presents hourly distributions of trip generation for both office and residential land uses. It is intended to supplement the information that is published in the ITE *Trip Generation Manual,* 9th Edition.

Data Collection

This article presents the results of a data collection effort of twenty-four hour trip generation data for office and residential land uses to supplement those currently published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual,* 9th Edition. The data reported is intended to assist planners and engineers seeking to project four, eight, twelve, or more than twelve hours of traffic volumes for a signal warrant analysis. Other important uses include conducting trip generation and parking demand analyses of multiple study hours as part of a traffic impact study for multiuse developments. Specifically, developments that are composed of land uses with differing peak hours for entering and exiting traffic, such as office, retail, residential, movie theaters, sports arenas, restaurants, and daycare centers for example. In addition, the hourly variations will be useful for estimating emissions associated with land use developments. The current method for determining hourly traffic distribution for a particular land use typically involves collecting field counts at a limited number of sites and then making important assumptions about adaptability to the analysis site. The primary goal of this data collection effort was to consolidate twenty-four hour data, collected and submitted for inclusion in ITE's trip generation database, with recently collected datasets. These data were then used to report the average percentage distributions in summary tables making it readily available for all transportation professionals.

Purpose

Most of the hourly datasets analyzed for this study were collected using tube counters and then submitted to ITE on spreadsheets organized in either fifteen-minute or one-hour intervals, typically for each individual driveway serving the site. These newly-collected raw datasets, as well as previously submitted twenty-four hour datasets from the ITE trip generation database, were compiled into spreadsheets in one-hour increments and assigned to the appropriate *Trip Generation Manual* land use codes with guidance from

Table 1: Office Uses Combined

Time	Average Weekday		Average Saturday		Average Sunday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6–7 a.m.	4.6	0.7	4.1	1.4	1.8	2.4
7–8 a.m.	14.9	1.9	5.4	2.5	3.8	1.2
8–9 a.m.	20.7	3.0	9.1	1.5	6.0	2.9
9–10 a.m.	8.2	3.2	7.2	3.9	6.6	3.8
10–11 a.m.	5.0	3.9	6.8	4.6	9.7	7.5
11–12 p.m.	5.1	8.6	7.1	11.3	8.9	9.6
12–1 p.m.	8.7	10.5	8.1	14.0	6.9	9.1
1–2 p.m.	10.0	6.6	7.3	8.3	8.6	12.0
2–3 p.m.	5.9	6.3	7.6	7.7	6.6	8.2
3–4 p.m.	4.3	9.5	6.0	9.6	4.6	6.3
4–5 p.m.	3.4	15.4	3.1	7.9	5.5	7.5
5–6 p.m.	2.5	16.5	3.2	6.9	3.1	6.7
6–7 p.m.	1.4	5.5	2.5	3.2	3.5	4.1
7–8 p.m.	0.9	2.5	2.0	2.2	2.7	2.9
8–9 p.m.	0.7	1.6	2.4	2.1	3.3	4.3
9–10 p.m.	0.6	1.1	1.4	1.4	3.1	3.1
10 p.m.–6 a.m.	3.2	3.2	16.9	11.4	15.3	8.4

ITE. Once hourly traffic calculations and land use code assignments were verified for accuracy by ITE staff, the average hourly traffic volumes were then summarized into tables as a percentage of the twenty-hour total entering and exiting vehicles from 6:00 a.m. to 10:00 p.m. This range of hours not only represents an expansion of four hours beyond the range of summary data published in previous editions of *Trip Generation* but also the inclusion of the critical morning commuter peak hours. For practical purposes, information was not provided for individual hours in the middle of the night. Instead, percentages for the combined period of 10:00 p.m. to 6:00 a.m. were provided in the last line of the summary tables. Where available, datasets for Saturdays and Sundays were also tabulated and summarized.

Office Land Uses

There were a total of 38 combined site observations for average weekday data, and five sites observed for each of Saturday and Sunday. The datasets were initially analyzed for each of three office land uses separately—General Office Building (710), Corporate Headquarters (714), and Office Park (750)—but due to the similarities in hourly distributions, it was determined that a combined summary table would provide a more robust and accurate depiction of hourly variations in traffic for general office uses. As expected, ingress traffic tended to be highest in the morning commuter period as office employees arrive for work, while egress traffic tended to be highest during the evening commuter period as office employees leave work for home. There was also a noticeable spike in the middle of the day due to office workers leaving and returning from lunch. The size of office developments analyzed ranged from 10,000 to 903,000 square feet. Based on the analysis conducted, it is noted that size of the office development had no discernible impact on the hourly distribution throughout the day.

Residential Land Uses

There were a total of 40 combined site observations for average weekday data, 36 site observations for average Saturday data, and 35 site observations for average Sunday data compiled for all residential land uses. Analysis of individual residential uses indicated that the general trip generation characteristics throughout the day were noticeably different between traditional residential uses (i.e., apartment, single family home, townhomes, condominiums) and senior-oriented residential uses (i.e., senior-attached, senior-detached, continuing care). Therefore, two separate and distinct summary tables combining similar types of residential uses (senior-oriented facilities only and non-senior residential only) were developed, as shown in Tables 2 and 3. As expected, the traditional residential uses generate a large egress of traffic during the weekday morning commuter rush hours and a similarly large ingress during the evening commuter peak hours. Contrarily, the largest ingress/egress period for senior-oriented residential uses tended to occur after the morning commuter peak hours and before the evening peak hours. The sizes of traditional residential uses

Table 2: Residential Uses Combined – Excluding Senior–Oriented Facilities

Time	Average Weekday		Average Saturday		Average Sunday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6–7 a.m.	1.6	5.7	1.1	2.1	0.9	1.9
7–8 a.m.	2.5	9.0	1.8	3.6	1.6	3.3
8–9 a.m.	3.7	9.1	2.8	5.6	2.6	4.7
9–10 a.m.	3.7	6.5	4.4	7.3	3.5	6.8
10–11 a.m.	4.1	5.5	5.6	7.7	6.3	7.5
11–12 p.m.	4.5	5.7	6.9	7.5	6.4	9.5
12–1 p.m.	5.3	5.3	6.6	7.8	6.9	7.6
1–2 p.m.	5.4	5.7	7.1	6.9	7.2	7.4
2–3 p.m.	6.5	5.9	7.1	6.7	7.2	6.6
3–4 p.m.	8.1	6.3	7.4	6.1	7.3	6.6
4–5 p.m.	9.8	6.3	8.5	5.9	8.0	6.7
5–6 p.m.	10.8	6.5	8.6	6.3	7.3	6.9
6–7 p.m.	8.5	5.1	6.4	6.0	5.8	5.1
7–8 p.m.	5.9	4.9	5.2	4.9	5.5	4.1
8–9 p.m.	5.1	3.4	4.2	3.6	4.6	3.3
9–10 p.m.	4.2	2.3	3.8	2.6	4.3	2.7
10 p.m.–6 a.m.	10.3	5.6	12.4	9.3	14.6	9.4

Table 3: Residential Uses Combined–Senior-Oriented Facilities Only

Time	Average Weekday		Average Saturday		Average Sunday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6–7 a.m.	3.6	2.0	4.0	1.3	3.7	1.5
7–8 a.m.	5.4	4.5	3.2	3.8	2.8	3.8
8–9 a.m.	6.5	5.8	3.3	3.6	2.9	4.4
9–10 a.m.	6.0	7.5	5.0	6.1	4.1	5.6
10–11 a.m.	7.3	8.0	7.5	7.1	7.6	6.6
11–12 p.m.	8.2	6.8	8.9	8.1	8.2	5.8
12–1 p.m.	8.2	7.7	8.0	7.3	8.6	6.8
1–2 p.m.	7.7	8.0	7.5	7.3	8.2	7.6
2–3 p.m.	8.8	8.0	8.6	7.7	9.5	9.6
3–4 p.m.	9.9	9.6	11.1	11.3	10.5	11.5
4–5 p.m.	6.7	7.6	6.6	7.3	6.8	7.4
5–6 p.m.	4.7	6.5	4.8	5.1	5.6	6.1
6–7 p.m.	3.9	4.4	4.4	3.9	5.2	4.7
7–8 p.m.	4.0	5.0	5.3	6.5	5.0	6.1
8–9 p.m.	3.0	3.1	3.9	4.6	4.3	4.9
9–10 p.m.	1.7	1.6	2.0	2.7	2.0	2.5
10 p.m.–6 a.m.	4.3	3.9	5.7	6.3	4.9	5.1

ranged from 46 to 1,248 dwelling units, and the sizes of senior-oriented developments analyzed ranged from 28 to 2,238 dwelling units. As with the office land use data, smaller and larger sized residential communities generally had similar hourly distributions.

The time-of-day summary tables reported both in this article and in the ninth edition should be used only as a reference. Professional judgment should be exercised with regard to the limited number of site observations, utilizing data for the hours after 10:00 p.m., and in situations where peak hour data may not fit perfectly with the distributions provided. As explained in *Trip Generation Handbook,* 3rd Edition, time-of-day data should not be used to determine peak hour traffic volumes. Instead, peak hour volumes should be estimated by using the standard regression analysis and data plots presented for each land use code in *Trip Generation Manual*. Also note that the percentages in the summary tables do not add up to 100 percent due to rounding. **itej**

Acknowledgments

The author would like to acknowledge the following organizations for responding to the "call for data" and contributing a large number of twenty-four hour trip generation datasets for this effort: The Traffic Group, Texas A&M Transportation Institute, Stantec-Street Smarts, Horner & Cantor Associates, and the Southern New Hampshire Planning Commission. The author would like to thank ITE for being supportive of this project from its inception.

Note

The twenty-four hour distribution of trip generation for office and residential land uses presented in the summary tables contained in this article are the result of an effort to develop and provide a useful tool that can be directly applicable to the work done daily by transportation professionals. Although the summary tables provided in this article and in the ninth edition cover a large share of the land uses most regularly analyzed by transportation professionals, the author strongly encourages readers to submit time-of-day trip generation data to ITE to improve the robustness of existing twenty-four hour distribution summaries and to allow summaries for additional land use codes to be established in future editions of Trip Generation Manual. *Time-of-day trip generation data can be submitted to ITE by completing the "Data Collection Form" located at www.ite.org/tripgeneration/index.asp.*



Aaron Zimmerman, PTP, *is a transportation planner coordinator for the Maryland-National Capital Park and Planning Commission in Silver Spring, MD, USA. He holds a master's degree in transportation policy, operations, and logistics from George Mason University and a bachelor's degree in urban planning from the State University of New York at Albany. From 2008–2009, Aaron worked at ITE headquarters as transportation planning director. During that timeframe he was instrumental in the founding of the organization Young Professionals in Transportation (YPT). Aaron currently serves on the ITE Young Member Committee and is treasurer for YPT International. He is a member of ITE.*

Appendix C

Engineering Technical Memo

DILLON CONSULTING

DILLON CONSULTING

CITY OF ST. THOMAS

Positioned for Growth – Engineering Technical Memorandum

Sanitary, Water and Storm Servicing Review

February 2020 – 18-9022

Table of Contents

1.0 Introduction 1

1.1 Background and Purpose 1

1.2 Scope of Work 1

2.0 Existing Conditions and Evaluation of Potential Settlement Areas 3

2.1 Area 1 3

2.2 Area 2 3

2.3 Area 3 4

2.4 Area 4 4

2.5 Selection of Preferred Area 4

3.0 Methodology 5

3.1 Sanitary Servicing 5

3.2 Water Servicing 5

3.3 Storm Servicing 5

4.0 Future Conditions 6

4.1 Population Projections 6

4.2 Water Demand 6

4.3 Sanitary Flow 6

4.4 Stormwater Runoff 7

5.0 Recommended Servicing Strategy for Area 1 7

5.1 Proposed Water Servicing Strategy 7

5.1.1 Proposed Connections, Alignment and Sizing 7

5.1.2 Requirements for Proposed Water Distribution System 9

5.2 Proposed Sanitary Servicing Strategy 10

5.2.1 Proposed Alignment and Sizing 10

5.2.2 Downstream Capacity Analysis 12

5.2.3 Requirements for Proposed Sanitary Collection System 15

5.3 Proposed Storm Servicing Strategy 16

5.3.1 Criteria for Proposed Stormwater Management (Quantity and Quality) 16

5.3.2 Requirements for Stormwater Servicing 17

Figures

Figure 1: Potential Settlement Expansion Areas 2
Figure 2: Conceptual Water Servicing Plan for Area 1 8
Figure 3: Conceptual Sanitary Servicing Plan for Area 1 11
Figure 3: 2018 Monthly Average Day Sewage Flow at St. Thomas WPCP 13

Tables

Table 1: Inflow and Infiltration Estimates at Sunset Sanitary Pumping Station 12

1.0 Introduction

1.1 Background and Purpose

Dillon Consulting Limited (Dillon) was retained by the City of St. Thomas (City) to assist with the Positioned for Growth Study. The City has a 20 year residential growth forecast of 50, 600 people by 2041. With this growth, comes the need to further expand the Urban Area boundary in the Official Plan to accommodate the projected needs for housing and continue to position St. Thomas for long term sustainability. The City has limited land options for expanding its Urban Area.

As part of the last settlement area expansion exercise in 2010, lands within the north-west quadrant of the City along with other land blocks on the west and south-east sides of St. Thomas were strategically assessed based on criteria derived from the Provincial Policy Statement. Based on that, high level assessment the lands in the south-east block were carried forward for detailed technical assessment and ultimately "Residential" redesignation in the Official Plan Amendment (OPA). The lands in the north-west quadrant which were screened out in the 2010 Urban Area Expansion were re-examined as part of this study.

The purpose of this study was to undertake the necessary planning and engineering studies to identify and technically support the preferred expansion lands and prepare the OPA to bring those lands into the Urban Area and designate them for development, while identifying the infrastructure and community services needed to support that growth.

1.2 Scope of Work

The purpose of this report is to document the sanitary, water and storm servicing review that was conducted as part of the overall Positioned for Growth Study.

A total of four areas located along the north-west limits of the City were initially evaluated to support the forecasted additional population and housing. Based on the *Update of the Population Forecast, Housing Demand and Residential Land Need Final Report (June 2018),* which was previously completed by Dillon and Watson & Associates, the shortfall in land available for housing is equivalent to 1,048 low and medium density units. **Figure 1** shows the geographic area for each settlement expansion area that was considered as part of the current study.

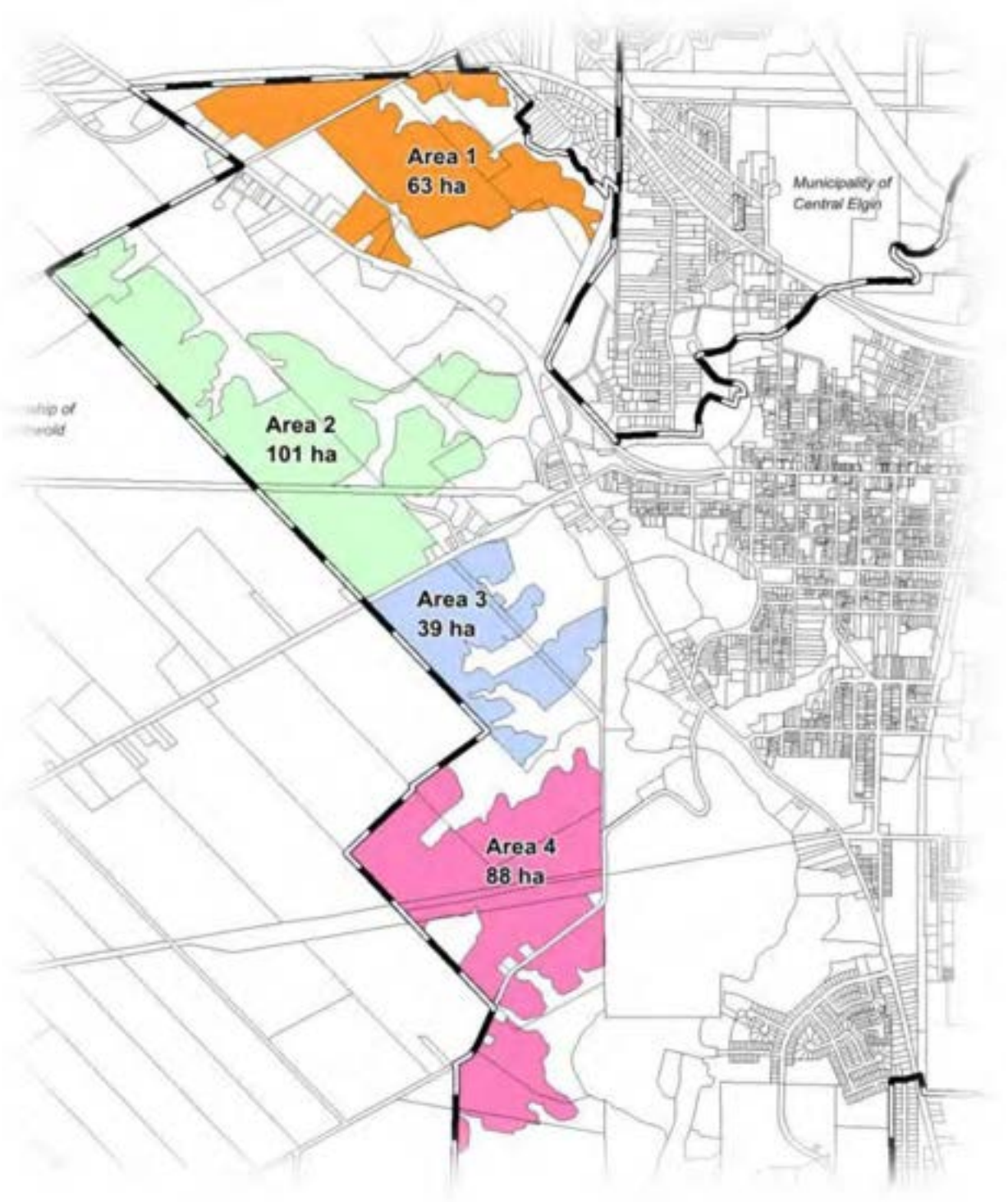


Figure 1: Potential Settlement Expansion Areas

2.0 Existing Conditions and Evaluation of Potential Settlement Areas

As part of Phase 1 of the Positioned for Growth Study, each of the four potential settlement areas were evaluated against several criteria in order to determine the preferred area to meet the current housing demands. The criteria incorporated in the evaluation process included a variety of elements, including proximity to existing built-up area, land use compatibility, ease of development, agricultural impacts, cultural, heritage and archaeology impacts, natural hazards and service by transit and road networks. The following sections describe each area's location, as well as outline the existing conditions and the high level requirements to provide sanitary and water servicing to each respective area. Storm servicing requirements are consistent across all areas as similar stormwater management practices could be applied to all areas.

2.1 Area 1

Area 1 is located within the north-west sector of the City, northeast of Sunset Drive, west of Wellington Road and south of the CN rail line and has 63 hectares of available land that could be developed.

Area 1 is located in close proximity to the existing water distribution system with opportunities to connect to either or both of the existing St. Thomas Secondary or City water distribution systems, subject to available capacity. Other existing properties along Sunset Drive could also benefit from the extension of municipal water services to this area of the City.

With respect to sanitary servicing, pump station(s) would be required to allow sanitary servicing to cross Dodd's Creek and Kettle Creek (at Wellington Road and Sunset Drive, respectively). Potential upgrades would also be required to increase the capacity of the Sunset Sanitary Pumping Station (Sunset SPS) and corresponding forcemain. The downstream sanitary servicing for Area 1 could also be sized to accommodate Area 2 and 3, should they be developed in the future.

2.2 Area 2

Area 2 is located within the western section of the City, north of Fingal Line, west of Sunset Drive, extending to the west and north limits of the City and has 101 hectares of available land that could be developed.

To provide water servicing to Area 2, opportunities exist to connect to both the City and/or the Township of Southwold (Southwold) water distribution systems, subject to available capacity.

In terms of sanitary servicing, the potential exists to service Area 2 lands by gravity sanitary sewer along Fingal Line, in conjunction with Area 3. A pump station would be required to cross Kettle Creek, west of Sunset Drive. Upgrades would be required to increase the capacity of the Sunset SPS and upgrades or replacement of the existing forcemain to the treatment plant.

2.3 Area 3

Area 3 is located within the western section of the City, adjacent to Area 2, and is found south of Fingal Line, west of Sunset Drive and extends to the west limits of the City. Area 3 has 39 hectares of available land that could be developed.

Similar to Area 2, to provide water servicing to Area 3, opportunities exist to connect to both the City and/or the Southwold water distribution systems, subject to available capacity.

In terms of sanitary servicing, the potential exists to service lands by gravity sanitary sewer along Fingal Line, in conjunction with Area 2. A pump station would be required to cross Kettle Creek, west of Sunset Drive. Potential upgrades may be required to increase the capacity of the Sunset SPS and replacement of the existing forcemain.

2.4 Area 4

Area 4 is located within the western section of the City, both north and south of Bush Line and fully west of Sunset Drive and has 88 hectares of available land that could be developed.

Area 4 is located furthest from potential connections to the existing City water distribution system. While this location is closest to the treatment plant, a pumping station would be required to cross Kettle Creek to provide sanitary servicing.

2.5 Selection of Preferred Area

Taking into account all evaluation criteria, including municipal servicing requirements, as outlined above, Area 1 was chosen as the preferred area to move forward for further assessment. Further information on the evaluation criteria and results can be found in the *Positioned for Growth: Planning Justification Report*.

3.0 Methodology

3.1 Sanitary Servicing

A high level review of the existing sanitary collection system in St. Thomas as it relates to Area 1 was completed. The City provided Dillon with 2018 flow data records for the St. Thomas Water Pollution Control Plant (WPCP) and the Sunset SPS, as well as a copy of the Environmental Compliance Approval (ECA) for the St. Thomas WPCP and the Operation and Maintenance Manual for the Sunset SPS.
The projected sanitary flows for the full build out Area 1 were established based on design criteria referenced in the *City of St. Thomas' Design Guidelines Manual, 2019 Edition (City Design Guidelines)*. This estimate was then used to determine sanitary servicing infrastructure requirements, as well as assess downstream capacity at the Sunset SPS and the St. Thomas WPCP.

3.2 Water Servicing

The City provided the current version of their WaterGEMS model (August 2019). This model was most recently updated by GHD as part of a St. Thomas Area Secondary Water Supply System (STASWSS) water modeling project which assessed the impact of the removal of the existing Ford Water Tower. The updates to the model that were completed by GHD included:

- Pump curve updates to represent the pump upgrades that were made to the Elgin Middlesex Pumping Station (EMPS) in 2018
- Pump curve updates to represent the pump upgrades that were made to the Albert Roberts Booster Station (BS) in 2018
- Updates to existing system demands by incorporating Supervisory Control and Data Acquisition (SCADA) data based on average day and maximum day demand
- Analysis under existing and future demand scenarios which included both the Ford Water Tower in operation and removed from service.

As part of the scope of this current study, the WaterGEMS model was used to analyse the impact on the existing distribution system with the increased demand allocated for the full build out of Area 1. The projected water demands were established based on design criteria referenced in the *City Design Guidelines*. This estimate was inputted into the model to assess water servicing infrastructure requirements that would be recommended for the development of Area 1.

3.3 Storm Servicing

Since Area 1 is located within the Kettle Creek Watershed, and ultimately within the Lynhurst Area Subwatershed Area, a background review of relevant stormwater studies provided by the City was completed to develop an understanding of the pre-development conditions in the vicinity of Area 1 and guidance which is in place for stormwater management within the subwatershed.

4.0 Future Conditions

4.1 Population Projections

As mentioned previously, the *Update of the Population Forecast, Housing Demand and Residential Land Need Final Report (June 2018)*, which was previously completed by Dillon and Watson & Associates, outlined the housing demand for the City is equivalent to 1,048 low and medium density units.

Area 1 has 63 ha of land which is available for development, net excluding natural heritage lands. Average unit rates of 22 units per hectare and 1.7 people per unit were developed by Watson & Associates. This equates to approximately 1,387 housing units and a population of 2,339 people. As such, Area 1 exceeds the current housing demand and has a surplus capacity of approximately 339 units.

4.2 Water Demand

According to the *City Design Guidelines*, the average domestic demand varies between 270 and 450 L/capita/day. For the purposes of this analysis, the average day demand was taken as an average of 300 L/capita/day.

The full build out of Area 1 (population of 2,339 people) would equate to an average day water demand of approximately 8.1 L/s.

2,339 people x 300 L/capita/day = 701,700 L/d = 8.1 L/s

As per the *City Design Guidelines*, the peaking factors for maximum day and maximum hour demands are to be 3.5 and 7.8, respectively. As such, the projected maximum day demand for the full build out of Area 1 would be 28.4 L/s and the maximum hour demand would be 63.2 L/s.

4.3 Sanitary Flow

As per the *City Design Guidelines*, the value of 250 L/capita/day should be used for estimating sanitary flow rates for new development. Additionally, infiltration and inflow should be estimated at 0.1 L/ha/s.

The full build out of Area 1 (population of 2,339 people) would equate to an estimated peak sanitary flow rate of approximately 23.8 L/s. This includes a Harmon peaking factor of 3.5.

Domestic flow: 2,339 people x 250 L/capita/day = 584,750 L/d = 6.8 L/s

Peak flow: Harmon peaking factor of 3.5 x 6.8 L/s = 23.8 L/s

Area 1 is 63 ha in size which would equate to an allowance of 6.3 L/s for infiltration and inflow. In summary, the total estimated sanitary flow rate for the full build out of Area 1 would be estimated to be 30.1 L/s (23.8 + 6.3 L/s).

4.4 Stormwater Runoff

Under post-development conditions, the level of imperviousness of an undeveloped area will increase from pre-development and as such, so will the amount of stormwater runoff from the drainage area. The runoff coefficients outlined in Section 7.2.5 *of the City Design Guidelines* should be used in quantifying pre and post-development runoff rates. Intensity Duration Frequency (IDF) curves for St. Thomas are derived from the Ministry of Transportation of Ontario.

5.0 Recommended Servicing Strategy for Area 1

5.1 Proposed Water Servicing Strategy

5.1.1 Proposed Connections, Alignment and Sizing

In order to provide water servicing to Area 1, it is recommended that a minimum of two connections be made to the existing water distribution system network for redundancy, fire flow availability and improvement of water quality. There are several potential connections that could be made to the existing systems including:

1. Connection to the existing 300 mm diameter watermain (Township of Southwold System off the St. Thomas Secondary System) near the intersection of Major Line and Ford Road
2. Connection to existing 350 mm diameter watermain (City System) at the intersection of Centre Street and Queen Street
3. Connection to existing 200 mm diameter watermain (Central Elgin System) at the intersection of Wellington Road and Crescent Avenue

Each of the above connections would require a watermain extension along existing road right-of-ways to reach the limits of Area 1. The current version of the City's WaterGEMS model was used to model the potential connections to evaluate available capacity assuming the full build out of Area 1. Based on the preliminary analysis completed by GHD in August 2019 with respect to the future of Ford Water Tower, it was assumed that the Ford Water Tower has been taken out of service as that was the ultimate recommendation that was made by GHD. The projected average day demand outlined in **Section 4.2** was applied to a junction central to Area 1. The water infrastructure for the existing development within the Township of Southwold, between McBain Line and Ford Road, was also added to the model as one of the potential connections (option 1 above) could be accessed through this development.

Based on the outcomes of the modelled scenarios, a conceptual water servicing plan of the recommended potential water servicing strategy is shown in **Figure 2**. Local distribution mains within Area 1 would be fed off this looped trunk watermain. An added benefit is that the existing developments along Sunset Road could also be serviced from this network.

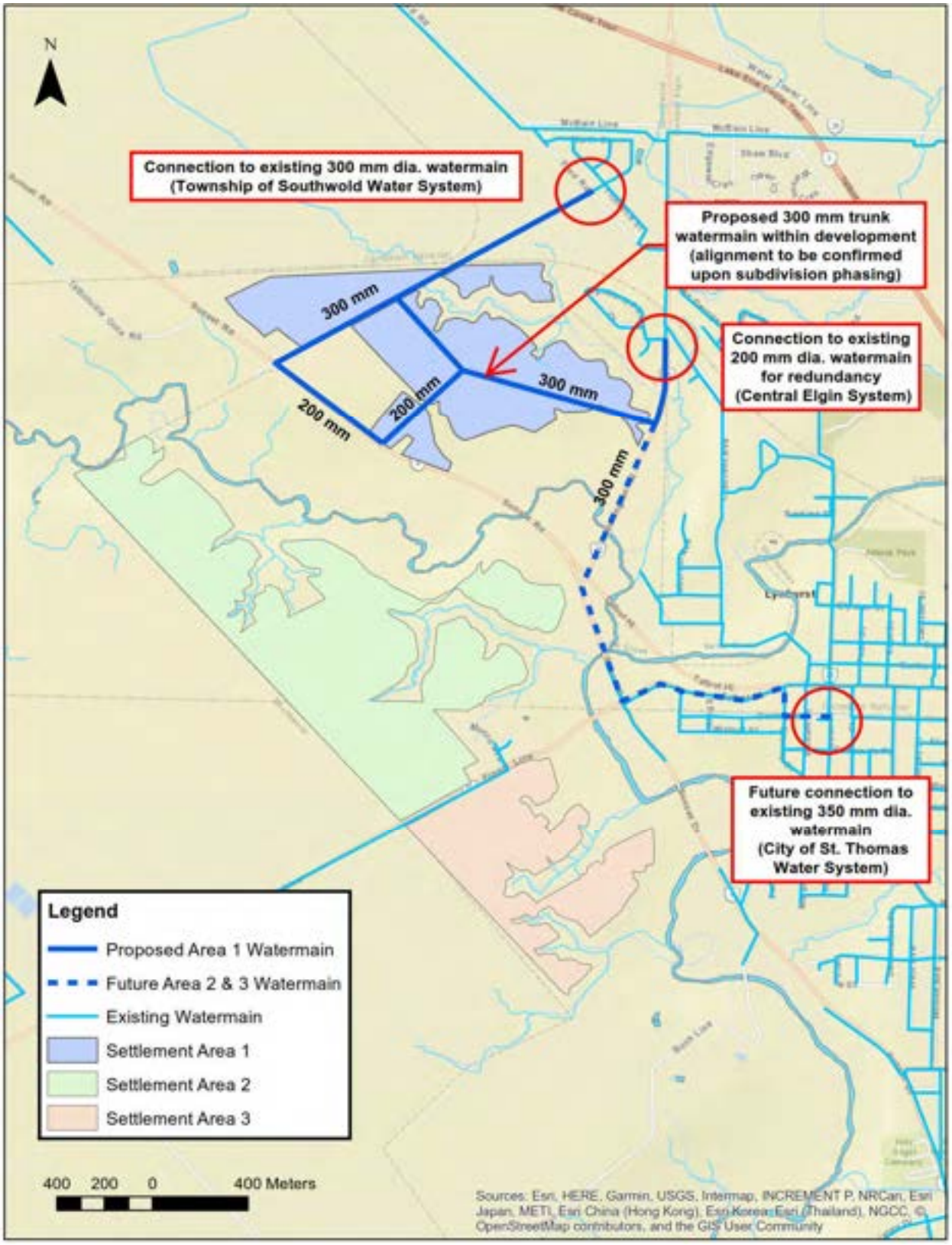


Figure 2: Conceptual Water Servicing Plan for Area 1

Based on full build out of Area 1 and a 300 mm diameter trunk looped watermain, the available pressure under average day and maximum day demand at the furthest point from supply is in the magnitude of 689 kPa (100 psi). This higher pressure is most directly linked to the modeled pressures within the St. Thomas Secondary System main without the Ford Water Tower in operation. Based on the existing conditions model, the pressures within the Secondary System with the Ford Water Tower in operation are lower at approximately 482 kPa (70 psi). Further detailed analysis and detailed design is currently being undertaken by Dillon Consulting related to the removal of the Ford Water Tower and recommended improvements for the operation of the St. Thomas Secondary System. The ultimate recommendations and outcomes from this work should be taken into account as part of the detailed design of the proposed trunk watermain system to service Area 1. Should the ultimate pressures within the St. Thomas Secondary System fall within a range of 80 psi to 100 psi once the Ford Water Tower is removed, it is recommended that a pressure reducing valve (PRV) or series of PRVs be installed downstream of the connection to the St. Thomas Secondary System which is servicing the Southwold subdivision and Area 1. The operating pressures should be reduced to the Ministry of the Environment Conservation and Parks' (MECP) normal operating range of 350-480 kPa (50-70 psi) under average day demand.

While the single feed could adequately service the full build out of the Area 1 development, a second connection at Wellington Road and Crescent Avenue would provide some redundancy to the City system. Should Areas 2 and 3 be developed, these areas would be serviced for water by extending a 300 mm watermain from the intersection of Centre Street and Queen Street. A future 300 mm watermain extension could be extended along Wellington Road and Sunset Drive to provide further redundancy to the City system. Further modeling is also recommended to be completed as part of detailed design of individual developments to confirm available operating pressure, and fire flow availability based on the proposed watermain configuration within the developments.

5.1.2 Requirements for Proposed Water Distribution System

All new construction for the water distribution system must adhere to the current *City Design Guidelines*. The MECP's *Design Guidelines for Drinking Water System* are also applicable, but in order of precedence, the *City Design Guidelines* shall govern.

5.1.3 Capital Costs for Proposed Water Distribution System and EA Requirements

For the purposes of a Development Charges study, the external water servicing costs based on the proposed strategy, including the trunk watermain proposed within Area 1, would be approximately $5.45 million dollars. **Table 1**, includes a more detailed breakdown of these estimated capital costs. The costs for the watermain extension proposed if Areas 2 and 3 develop in the future (see **Figure 2**) are excluded from this cost estimate.

Table 1: Water Distribution Capital Cost Estimate

Item	Estimated Quantity	Unit Rate	Total Estimate
Watermain Extension	4,150 m	$1,200 / m*	$5.0 million
Connections to existing watermain and PRV(s)	-	Lump sum	$250,000
Rail and watercourse crossings	2	$100,000	$200,000
		Total	$5.45 million

*Unit rates include 10% for miscellaneous construction costs such as bonding and insurances and 15% for engineering

It should be noted that, as long as all of the proposed water infrastructure is constructed within an existing right-of-way or utility corridor, an Environment Assessment would not be required. This is also under the premise that any water crossing would be completed via Trenchless Technology.

5.2 Proposed Sanitary Servicing Strategy

5.2.1 Proposed Alignment and Sizing Upstream of Sunset Sanitary Pumping Station

In order to provide sanitary servicing to the limits of Area 1, it is recommended that a trunk sanitary sewer be installed from the eastern limits of the area, south along Wellington Road to Sunset Drive and then south on Sunset Drive to the location of the existing Sunset SPS (approximately 1,550 m). Local sanitary sewers within Area 1 could be designed to collect sewage via gravity along the proposed internal road network and drain to the eastern limits at Wellington Road. A gravity sewer could also be constructed along Sunset Drive to service the existing properties between Major Line and Wellington Road. This sewer could be tied into the internal gravity network within Area 1.

Due to existing topography, an intermediate pump station would be required to allow the trunk sanitary servicing to cross Dodd's Creek and Kettle Creek (at Wellington Road and Sunset Drive, respectively). It is recommended that one pumping station be constructed at the most upstream crossing (Dodd's Creek at Wellington Road) with a forcemain installed between the two crossings. Servicing via gravity would then be feasible from the second crossing to the Sunset SPS. The existing flow from other areas of the City plus the additional flow from Area 1 would be then be pumped via forcemain (approximately 975 m) from the Sunset SPS to the St. Thomas WPCP.

As outlined in **Section 4.3**, the projected peak sanitary flow rate for the full build out of Area 1 is 30.1 L/s. A 300 mm diameter trunk gravity sewer at the required minimum grade of 0.22% (per *City Design Guidelines*) would provide sufficient capacity of 45 L/s (approximately 66% full). The forcemain between Dodd's Creek and Kettle Creek would need to be 150 mm diameter to provide sufficient capacity and meet MECP velocity criteria.

See **Figure 3** for a conceptual sanitary servicing plan for Area 1.

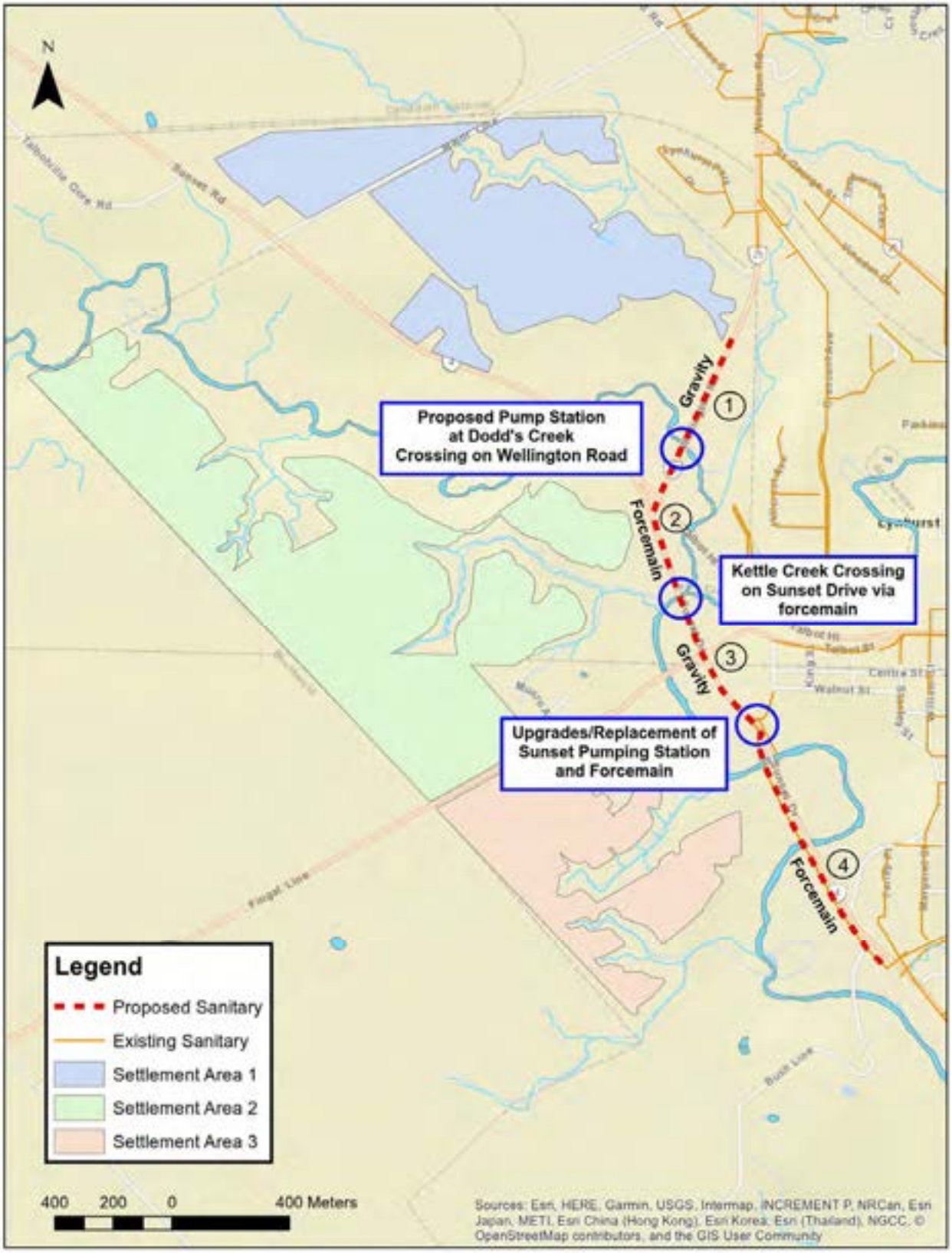


Figure 3: Conceptual Sanitary Servicing Plan for Area 1

5.2.2 Existing Downstream Capacity Analysis

In terms of evaluating available downstream capacity, it is critical to assess the impact of the increase in flows at both the Sunset SPS (and associated forcemain), as well as the St. Thomas WPCP. As previously mentioned, the City provided Dillon with 2018 flow data records for both facilities, as well as a copy of the Environmental Compliance Approval (ECA) for the St. Thomas WPCP and Operation and Maintenance Manual for Sunset SPS.

5.2.2.1 Sunset Sanitary Pumping Station

The current capacity of each of the duty and standby pumps at the Sunset SPS is 23 L/s. It is understood from City staff that there are currently frequent overflows at the Sunset SPS, as well as inflow and infiltration issues due to the combined sewers upstream of this station. The City provided record of the overflow occurrences in 2018 (10 instances during snow melt and/or wet weather events), as well as estimates for the percentage of the pumped flow which is attributed to inflow and infiltration for 2016 to 2018. **Table 2** summarizes the inflow and infiltration estimates that the City has derived for the last three (3) years.

Table 2: Inflow and Infiltration Estimates at Sunset Sanitary Pumping Station

	Inflow and Infiltration Percentage of Flow		
	2016	2017	2018
Minimum	0%	2%	26%
Average	39%	44%	57%
Maximum	73%	69%	80%

The regular occurrence of overflows at pumping stations is not industry best practice. Based on the frequency of such events which currently occur at the Sunset SPS during wet weather events, it is recommended that the Sunset PS being upgraded or replaced prior to the development of Area 1. The additional flows from Area 1 would only increase the frequency of overflows as the base dry weather volume would also increase. Prior to the detailed design of the upgrades, it is also recommended that an inflow and infiltration program be initiated, especially in the known problem areas of the upstream drainage area. This would help minimize the magnitude of the inflow and infiltration volume that is pumped and could also reduce the size and capital costs of the infrastructure that would be required for the upgraded pump station.

Additionally, the existing 150 mm diameter forcemain which connects the Sunset PS to the St. Thomas WPCP is 1973 vintage and is likely nearing the end of its lifespan. With upgrades or replacement of the Sunset SPS recommended, it is reasonable to assume that the forcemain could be replaced at the same time. As part of the upgrades to the Sunset SPS, it could also be feasible to construct some offline storage that could be utilized during periods of high flow to reduce the frequency of overflows and the impact of the inflow and infiltration/combined sewers upstream.

Based on data provided by the City, in 2018 the highest peak overflow at the Sunset SPS was 58.5 m^3 over 0.8 hour. This corresponds to an overflow flow rate of 20 L/s, which combined with the existing 23 L/s pump capacity would total a combined peak flow rate of 43 L/s. The existing Sunset SPS is not sized to handle this magnitude of flow and does not have the capacity for any additional flow from new developments in its current state.

5.2.2.2 St. Thomas Water Pollution Control Plant and Combined Sewer Overflow Facility

In accordance of the ECA for the St. Thomas WPCP, the rated capacity of the entire facility is 27,300 m^3/day. For the last seven (7) years (2012-2018), the percentage of the 27,300 m^3/day capacity which has been utilized has ranged from 53-66%. **Figure 3** below shows the monthly average day sewage flow from the *2018 St. Thomas Water Pollution Control Plant Performance Report*.

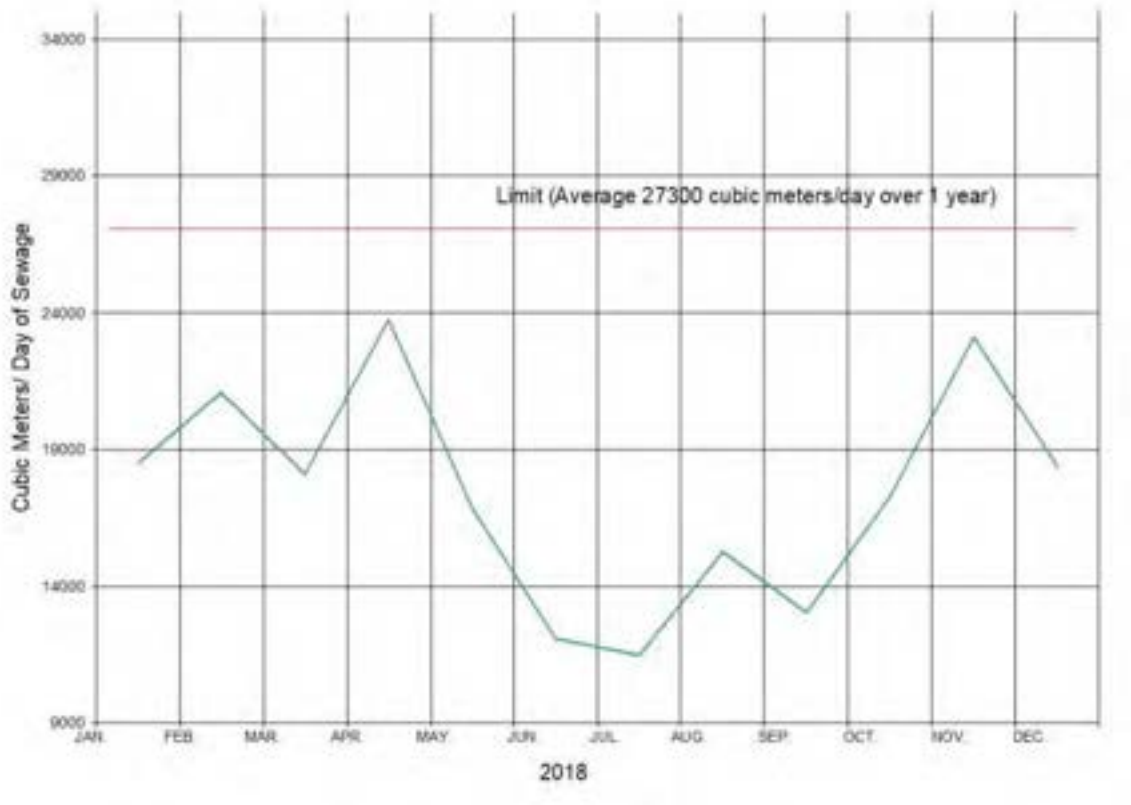


Figure 4: 2018 Monthly Average Day Sewage Flow at St. Thomas WPCP

The additional projected average day sewage flow from the full build out of Area 1, plus the allowance for infiltration and inflow is estimated to be 13.1 L/s. This equates to approximately 1,132 m^3/day of additional flow (or approximately 4% of the rated capacity) which would flow to the St. Thomas WPCP. Therefore, based on currently available flow data, there is sufficient capacity at the St. Thomas WPCP to accommodate the projected additional flows from Area 1 under dry weather flow conditions.

However, as indicated in the *2018 St. Thomas Water Pollution Control Plant Performance Report*, wet weather conditions are linked to overflow occurrences at the Combined Sewer Overflow (CSO) Facility, which is located upstream of the St. Thomas WPCP. In 2018, there were 13 overflows, with a total combined volume of 355,385 m^3, with each occurrence corresponding to an intense rainfall event and/or snow melt. Similar to the Sunset SPS, the high frequency of overflows at this facility are linked to upstream inflow and infiltration issues. This issue further stresses the importance of initiating an inflow and infiltration program in the upstream drainage area prior to the development of Area 1 to help reduce the magnitude of the inflow and infiltration volume that is currently being handled by the CSO Facility.

Additional storage may be required to help offset inflow and infiltration flows present in the sewage collection system. The City is undertaking a Pollution Prevention and Control Plan (PPCP) Study in 2020 to investigate these flows and best strategies and recommendations (ie. storage, increase treatment capacity, etc.) to mitigate their impacts on the sewage system.

5.2.2.3 Future Development of Areas 2 and 3

It is also foreseeable in the future that Areas 2 and 3 could develop so it is important that the common downstream infrastructure components (i.e. gravity sewer on Sunset Drive (south of Fingal Line), Sunset SPS and downstream forcemain) be sized appropriately upfront to account for the potential additional flow from both of these areas as well.

Based on a similar rationale to Area 1, the projected peak flows from both Areas 2 and 3 is approximately equivalent to 62 L/s, based on full build out. Areas 2 and 3 equate to a combined total area of 140 ha of developable land, with the potential for 3,083 housing units and an estimated population of 5,198 people. As such, the combined projected peak flows of Areas 1 through 3 would be approximately 92 L/s which could be conveyed by gravity along Sunset Drive from Fingal Line to the Sunset SPS in a 525 mm diameter sewer at minimum grade of 0.10%.

The recommended upgrades/replacement of the Sunset SPS and forcemain should be sized appropriately to provide capacity for the existing drainage area (including allowance for inflow and infiltration), as well as projected flows from Areas 1 through 3. Based on the estimated peak flow of 92 L/s flow from Areas 1 through 3 and the estimated current peak flows during overflow periods through the Sunset SPS (43 L/s), the pumps at the upgraded Sunset SPS would need to be sized to accommodate up to 135 L/s, with a 250 mm diameter forcemain to the St. Thomas WPCP. This is assuming that no course of action is taken to address the upstream inflow and infiltration issues. If the percentage of inflow and infiltration handled at the Sunset SPS was reduced to the City's target of 32% or lower, the capacity of the pumps required could be reduced. Although reduced inflow and infiltration would allow for a smaller pump station, a 250 mm diameter forcemain would still be required to meet MECP velocity design criteria for the 92 L/s estimated peak flow from Areas 1 through 3.

5.2.3 Requirements for Proposed Sanitary Collection System

All new construction for the sanitary collection system must adhere to the current City Design Guidelines. The MECP's *Design Guidelines for Sewage Works* are also applicable, but in order of precedence, the City's Design Guidelines shall govern. An Environmental Compliance Approval (ECA) is also required to be obtained from the MECP for the proposed sanitary sewer collection system.

5.2.4 Servicing Costs for Proposed Sanitary Collection System and EA Requirements

For the purposes of a Development Charges study, the external sanitary servicing costs based on the proposed strategy noted above would be approximately $8.0 million dollars. **Table 3**, provides a detailed breakdown of the estimated capital costs. Refer to **Figure 3** for the pipe sections.

Table 3: Sanitary Collection Capital Cost Estimate

Item	Estimated Quantity	Unit Rate	Total Estimate
Gravity Sewer (section 1)	400 m	$1,300 / m*	$520,000
Forcemain (section 2)	600 m	$1,000 / m*	$600,000
Gravity Sewer (section 3)	500 m	$1,300 / m*	$650,000
Forcemain (section 4)	1,000 m	$1,000 / m*	$1.0 million
Sunset Drive Gravity Sewer	850 m	$1,300 / m*	$1.1 million
New Pumping Station at Dodd's Creek	-	Lump sum	$750,000
Replacement/Upgrades of Sunset SPS	-	Lump sum	$1.4 million
Additional Storage at Sunset SPS (to be confirmed through PPCP study)	-	Lump sum	$1.0 million
Watercourse crossings	4	$250,000 each	$1.0 million
		Total	$8.0 million

*Unit rates include 10% for miscellaneous construction costs such as bonding and insurances and 15% for engineering

It should be noted that, as long as all of the proposed wastewater linear infrastructure is constructed within an existing right-of-way or utility corridor, an Environment Assessment would not be required. This is based on the following excerpt from the Municipal Class EA document under 'Schedule A+ or pre-approved activities, Wastewater Management Projects':

- "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.

Schedule B EA's would be required where a new pumping station is being constructed or there is an increase in pumping station capacity by adding or replacing equipment appurtenances, where new equipment is located in a new building or structure.

5.3 Proposed Storm Servicing Strategy

Stormwater servicing strategies will be developed on an individual development basis within Area 1. Based on existing topography, the adjacent watercourses can be utilized as stormwater outlets and the proposed local street work can be used as the basis for the local collection system. It is recommended that wherever feasible, and approved by regulatory agencies, stormwater management facilities be regional facilities and be constructed in the valley lands, as opposed to on the tablelands which are suitable for development.

The following sections outline the criteria and requirements that should be taken into consideration as part of the design of each development's respective storm servicing and stormwater management strategy.

5.3.1 Criteria for Proposed Stormwater Management (Quantity and Quality)

Since Area 1 falls within the Lynhurst Area Subwatershed, the recommendations and guidance set out in the *Lynhurst Area Subwatershed Study, 1996 (Lynhurst Subwatershed Study*), prepared by M.M. Dillon, should be taken into consideration when preparing the preliminary and detailed stormwater management design of the proposed developments. Overall, the *Lynhurst Subwatershed Study* recommends that the MECP's *Stormwater Management Planning and Design Manual* should be adhered to, but some particular items included which are specific to this area are as follows:

- End-of-pipe stormwater management (SWM) facilities, complemented with a series of lot level (i.e. reduced lot grading, soakaway pits) and conveyance SWM practices (i.e. pervious pipes, grassed swales), are recommended. The function of these facilities is to provide both water quantity control (i.e. peak flow control for flooding and streambank erosion) and water quality enhancement of urban stormwater runoff.
- The use of a limited number of strategically located SWM facilities is favoured for both environmental and practical consideration. Past experience indicates that a reduced number of regional facilities achieve a higher standard of performance in terms of water quality abatement, while also minimizing maintenance and operational requirements once constructed. Generally, the economics of regional facilities are more favourable, resulting in a more cost-effective use of available lands.
- The ultimate size, type and configuration of the proposed SWM facilities will depend on site-specific constraints and opportunities for ecosystem enhancement/restoration. The following prioritization of facility selection should be:
    - Artificial/constructed wetland
    - Wet pond
    - Dry pond
- Due to the erosion sensitive nature of the valleylands, every effort should be made to minimize the number of storm sewer outfalls. Furthermore, all outlets should be designed to minimize outlet velocities to non-erodible levels (typically <1.0 m/s) and/or provide adequate protection

measures for energy dissipation, such as storm sewer headwalls with chute block aprons, gabion mats, rip-rap, etc.

- Geotechnical investigations should be carried out as part of the design process to assess the suitability to accommodate SWM facilities, particularly with regards to groundwater levels and slope stability concerns of the adjacent ravine valleys.
- Each development proponent will be responsible for preparing a detailed stormwater management report that discusses how stormwater generated from the proposed development will be managed in accordance to the intent of the Lynhurst Area Subwatershed Plan.

The *City Design Guidelines* also outline several stormwater management design criteria related to quantity and quality that should be adhered to. These include:

- Peak flows discharged from a site shall not increase as a result of the proposed development for the calculated 2 through 100-year storm events.
- All SWM measures shall provide an 'Enhanced' level of protection in accordance with the MECP's *Stormwater Management Planning and Design Manual.*
- Extended detention and storage SWM facilities should discharge over a 24-48 hour period to the 5 year storm event under pre-development conditions.

5.3.2 Requirements for Stormwater Servicing

Area 1 is located within the Kettle Creek Watershed and as such, is regulated by the Kettle Creek Conservation Authority (KCCA). As per Section 28 of the Conservation Authorities Act, KCCA must grant permission prior to any development and/or alterations within its regulatory jurisdiction. The current regulation for the Kettle Creek watershed is O.Reg.181/06: Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. In reference to S.3(1) O.Reg.181/06, KCCA may grant permission for development within its regulatory jurisdiction if, in its opinion, the control of flooding, erosion, dynamic beach, pollution or the conservation of land will not be affected by the development.

All new construction for the storm sewer system must adhere to the current *City Design Guidelines*. The Ontario Provincial Standard Specifications (OPSS), Ontario Provincial Standard Drawings (OPSD), and the MECP's *Design Guidelines for Sewage Works* shall also govern, where applicable. An ECA is also required to be obtained from the MECP for the proposed storm sewer collection system.

5.3.3 External Capital Costs for Stormwater Servicing and EA Requirements

As noted above, there are no expected external stormwater works, and therefore no costs have been estimated. An EA for stormwater servicing is not anticipated to be required under the premise that all stormwater servicing will be completed and controlled through the Draft Plan of Subdivision process.

DILLON CONSULTING LIMITED
LONDON, ONTARIO



Jason Johnson, P.Eng.
Partner



Catherine Liscumb, P.Eng.
Municipal Engineer

Appendix D

Proposed Official Plan Amendment

PART B - THE AMENDMENT

1. INTRODUCTORY STATEMENT

All of this part of the document entitled "Part B - the Amendment" consisting of the following text and schedules constitutes Amendment No. 97 to the Official Plan of the City of St. Thomas.

2. DETAILS OF THE AMENDMENT

The Official Plan is amended as follows:

Part 1 of the Official Plan Amendment

Item 1.1: Schedule "A" Land Use Plan to the Official Plan of the City of St. Thomas is amended by designating the lands identified as Item 1.1 on the Location Plan, attached in Appendix I to this amendment, from "Rural Lands" to "Residential".

Item 1.2: Schedule "A" Land Use Plan to the Official Plan of the City of St. Thomas is amended by designating the lands identified as Item 1.2 on the Location Plan, attached in Appendix I to this amendment, from "Employment Lands" to "Residential".

Part 2 of the Official Plan Amendment

Item 2.1 (Subsection 1: Framework of the Official Plan)

Subsection 1.1.4 is amended by deleting the first sentence and replacing it with the following sentence:

"1.1.4 The land use policies and designations are to guide development, redevelopment and/or infill/intensification in the City of St. Thomas for the period ending in 2038."

Item 2.2 (Subsection 3.1: Population Projection)

Subsection 3.1.1 is deleted and replaced by the following new subsection:

"3.1.1 A population of 50,600 persons by the year 2041 is projected. This target reflects the anticipated growth patterns in the London Housing Market Area."

Item 2.3 (Subsection 3.2: Population Capacity)

Subsection 3.2 is deleted and replaced by the following new subsection:

"3.2.1 The population capacity for the City of St. Thomas is as follows:

Projected 2038 demand for 3,975 low density, 567 medium density and 568 high density residential units.

Projected year 2038 gross residential land supply requirement to accommodate the projected housing demand is up to ± 76 ha. (±188 ac.)."

Item 2.4 (Subsection 5.1: Residential)

Subsection 5.1.3.1 is deleted and replaced with the following new subsection:

"5.1.3.1 The "Residential" designation on Schedule "A" means the predominant use of land shall be for low, medium and high density residential use. Certain other uses are permitted subject to policies in this section. The target housing mix for the City will comprise about 78% low density, 11% medium density, and 11% high density residential development."

Item 2.5 (Subsection 5.1: Residential – Additional Dwelling Units)

Subsection 5.1.3.7 is amended by adding the following new subsection:

"5.1.3.7.1 Additional Dwelling Units

Additional residential units are separate and complete dwelling units that are created within a single detached, semi-detached or rowhouse, regardless of whether the physical alteration of the house is required to create two residential units. The following policies will apply to the development of second residential units:

a) Additional residential units are permitted in a detached house, semi-detached house or rowhouse and in a building or structure ancillary to a detached house, semi-detached house or rowhouse.

b) The lands on which the additional dwelling unit is to be created are zoned to permit residential use other than as an ancillary use.

c) An amendment to the comprehensive Zoning By-law will be implemented to put into effect the policies of this subsection.

d) The additional dwelling unit can be independently serviced with full municipal sanitary sewage, storm sewage and piped water services.

e) Development of an additional residential dwelling unit will be subject to the following criteria:

   i. The additional dwelling unit shall not change the general characteristics of a single detached, semi-detached or rowhouse structure; and

   ii. The additional dwelling unit will comply with the Ontario Building Code and the Fire Code.

Item 2.6 (Subsection 6.1: Background - Housing)

Subsection 6.1.1 is amended by deleting the first sentence and replacing it with the following sentence:

"The City of St. Thomas has prepared a Population Forecast, Housing Demand, and Residential Land Need update to address the requirements of the Province of Ontario 2014 Provincial Policy Statement."

Item 2.7 (Subsection 6.2.6: Affordable Housing Definition and Target)

Subsection 6.2.6 is deleted and replaced with the following new subsection:

"6.2.6 Council shall ensure that a portion of new ownership and rental housing is affordable as defined by provincial policy:

a) in the case of ownership housing, the least expensive of:

1. housing for which the purchase price results in annual accommodation costs which do not exceed 30 percent of gross annual household income for low and moderate income households; or
2. housing for which the purchase price is at least 10 percent below the average purchase price of a resale unit in the regional market area;

b) in the case of rental housing, the least expensive of:

1. a unit for which the rent does not exceed 30 percent of gross annual household income for low and moderate income households; or
2. a unit for which the rent is at or below the average market rent of a unit in the regional market area.

Council shall endeavour to meet a target of 807 affordable housing units (35 per year) by 2041."

Part 3 of the Official Plan Amendment

Schedule "A" Land Use Plan to the Official Plan of the City of St. Thomas is further amended by deleting Schedule "A" and replacing it with a new Schedule "A", attached as Schedule I and forming part of this amendment, consolidating the land use designation changes and mapping updates made under Part 1 of this amendment.

3. IMPLEMENTATION AND INTERPRETATION

The implementation and interpretation of this Amendment shall be in accordance with the respective policies of the City of St. Thomas Official Plan.

SCHEDULE "A"

TO THE OFFICIAL PLAN
OF THE CITY OF ST. THOMAS

LAND USE PLAN

LAND USE DESIGNATION

- Residential
- Downtown Residential
- Talbot West
- Talbot Central
- Talbot East
- Power Centre
- Major Commercial
- Mixed Use Development
- Secondary Commercial
- Minor Commercial
- Highway Commercial
- Office Professional
- Employment Lands
- Business Employment
- Open Space and Conservation
- STORC Complex
- Natural Heritage
- Natural Hazard
- Railway Tourism
- Rural Area
- Ed / Rec Complex
- ★ Former Waste Site
- ◆ Transfer Station
- ● Sewage Treatement Plant

Note:Source MOE Waste Disposal Site Inventory - June 1991

Municipality of Central Elgin

Township of Southwold

Municipality of Central Elgin

Municipality of Central Elgin

OPA # 97
Employment Lands to Residential



N
W E
S

Prepared by the St. Thomas Planning and Building Services Department

0 400 800 1200
Metres

12/04/2019

Schedule "A" forms part of the Official Plan of the City of St. Thomas and must be read in conjunction with the written text.

ST. THOMAS
THE RAILWAY CITY

Legend

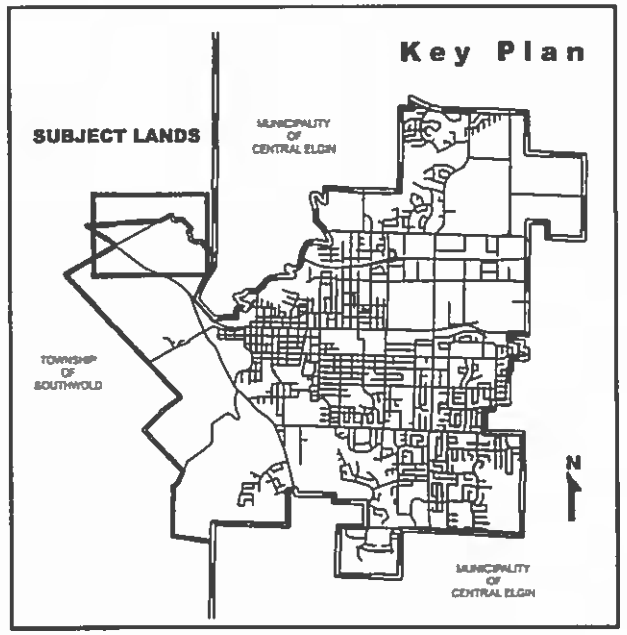
- Railway
- Water Course
- Water Body
- St. Thomas Boundary

SCHEDULE "I"
TO OFFICIAL PLAN AMENDMENT No. 97
CITY OF ST. THOMAS

APPENDIX I

OFFICIAL PLAN and
CONCURRENT IMPLEMENTING
ZONING BY-LAW AMENDMENT

LOCATION PLAN





LEGEND:

Subject Lands

NORTH

0 25 50 75

METRES

Scale: 1:1,500

Note: 2015 Aerial Photography

12/04/2019

Appendix E

Proposed Zoning By-law Amendment

CITY OF ST. THOMAS

BY-LAW NO. _____

A By-law to amend By-law 50-88

THE COUNCIL OF THE CORPORATION OF THE CITY OF ST. THOMAS ENACTS AS FOLLOWS:

1. Zoning Map 44 to by-law 50-88 is hereby deleted.

2. Schedule "A" to this Bylaw is hereby adopted, and shall be known as Zoning Map 44 to By-law 50-88 as amended.

3. Zoning Map 45 to by-law 50-88 is hereby deleted.

4. Schedule "B" to this Bylaw is hereby adopted, and shall be known as Zoning Map 45 to By-law 50-88 as amended.

5. Zoning Map 45 to By-law 50-88 as amended is further amended by zoning the lands outlined in heavy solid lines on Schedule "C" hereto as "R7-6" and such Schedule shall be added to and form part of By-law 50-88 as amended and shall be known as "Special Zoning Map 45-2" to By-law 50-88 as amended.

6. Zoning Map 46 to By-law 50-88 as amended is further amended by zoning the lands outlined in heavy solid lines on Schedule "D" hereto as "R7-6", by zoning the lands shown hatched on Schedule "B" as "R1-33", and by zoning the lands shown cross-hatched on Schedule "B" as "R1-34", and such Schedule shall be added to and form part of By-law 50-88 as amended and shall be known as "Special Zoning Map 46-1" to By-law 50-88 as amended.

7. By-law 50-88 as amended is further amended by adding to subsection 11.3 the following paragraph:

"11.3.6 Special Zone

(a) Area Affected
R7-6 as shown on Special Zoning Map 45-2 and Special Zoning Map 46-1.

(b) Applicable Provisions
The provisions of subsections 11.1 and 11.2 and all other applicable provisions of this By-law shall apply to the area affected.

(c) Holding Zone Provisions
Subwatershed Study - To ensure that environmental concerns are addressed, the "h1" symbol shall not be deleted from the Zone until a scoped subwatershed study, or a scoped update to the Lynhurst Area Subwatershed Study (Dillon Consulting, April 1996), is completed to the satisfaction of the City for the area affected."

8. By-law 50-88 as amended is further amended by adding to subsection 5.5 the following paragraph:

"5.5.33 Special Zone

(a) Area Affected
R1-33 as shown on Special Zoning Map 46-1.

(b) Only Permitted Uses
Single detached dwelling
Home occupation
Accessory uses

(c) Only Permitted Buildings and Structures
Buildings and structures for the uses permitted by (b) of this paragraph 5.5.33.

(d) Services Required

In this special zone, the following requirements for services shall apply:

(i) Subject to (ii), no building or structure shall be erected or used for any purpose permitted by (b) of this paragraph 5.5.33 unless the following municipal services are available to service the building or structure and the land on which it is situate:

(1) a water supply system, and
(2) a sanitary sewage system and a storm system.

(ii) Buildings or structures may be used for any purpose permitted by (b) of this paragraph 5.5.33 if:

(1) a water supply system provided by the municipality or a well is available to service any building or structure and the land on which it is situate; and

(2) the sanitary waste from such building or structure is discharged to a sanitary waste disposal system approved by the City."

9. By-law 50-88 as amended is further amended by adding to subsection 5.5 the following paragraph:

"5.5.34 Special Zone

(a) Area Affected
R1-34 as shown on Special Zoning Map 46-1.

(b) Only Permitted Uses
Single detached dwelling
An electrical contracting business accessory to a single detached dwelling.
Accessory uses

(c) Only Permitted Buildings and Structures
Buildings and structures for the uses permitted by (b) of this paragraph 5.5.34.

(d) Services Required
In this special zone, the following requirements for services shall apply:

(j) Subject to (ii), no building or structure shall be erected or used for any purpose permitted by (b) of this paragraph 5.5.34 unless the following municipal services are available to service the building or structure and the land on which it is situate:

(1) a water supply system, and
(2) a sanitary sewage system and a storm system.

(ii) Buildings or structures may be used for any purpose permitted by (b) of this paragraph 5.5.34 if:

(1) a water supply system provided by the municipality or a well is available to service any building or structure and the land on which it is situate; and

(2) the sanitary waste from such building or structure is discharged to a sanitary waste disposal system approved by the City."

10. By-law 50-88 as amended is further amended by deleting subsection 2.2 and replacing it with the following:

"2.2 HOLDING ZONES

2.2.1 Use of Zone Symbol
Where the symbol "h" appears on a Zoning Map or on a Special Zoning Map as a prefix to

a Zone Symbol or Special Zoning Symbol, notwithstanding the provisions of that zone or special zone, unless this by-law has been amended to remove the relevant "h" symbol, those lands shall not be developed or used except for uses permitted by paragraph 2.2.2.

2.2.2 Permitted Interim Uses
Existing uses.

2.2.3 Holding Zone Provisions

(a) Plan of subdivision - to ensure the orderly development of lands, the "h" symbol shall not be deleted until a subdivision agreement is entered into for the lands in question with the City Corporation.

(b) Municipal Services - to ensure that there is sewage capacity for the lands in question, the "h" symbol shall not be deleted until the Director, Environmental Services and City Engineer certifies that in his opinion the City Corporation has adequate uncommitted reserve sewage capacity for the orderly development of the lands in question.

(c) Survey Requirements - where the limits of development abut or are in the vicinity of a Natural Heritage Zone (NH) or a Hazard Land Zone (HL), to ensure that such limits are adequately defined, the "h" symbol shall not be deleted until the Erosion Hazard Limit has been delineated to the satisfaction of the City Corporation and the Kettle Creek Conservation Authority.

(d) Environmental Impact Study - to ensure that all environmental concerns are addressed in respect of lands abutting or in the vicinity of a Natural Heritage Zone - NH, the "h" symbol shall not be deleted until an environmental impact study has been finalized in respect of such lands that is satisfactory to the City Corporation."

11. In anticipation of the eventual consolidation of By-law 50-88 and all amendments to such By-law, including this amendment, Schedule "E" to this Bylaw is hereby adopted, such Schedule being Zoning Map 45 to By-law 50-88 amended to include the changes made in such Zoning Map by all amendments to By-law 50-88 to date, including this amendment.

12. In anticipation of the eventual consolidation of By-law 50-88 and all amendments to such By-law, including this amendment, Schedule "F" to this Bylaw is hereby adopted, such Schedule being Zoning Map 46 to By-law 50-88 amended to include the changes made in such Zoning Map by all amendments to By-law 50-88 to date, including this amendment.

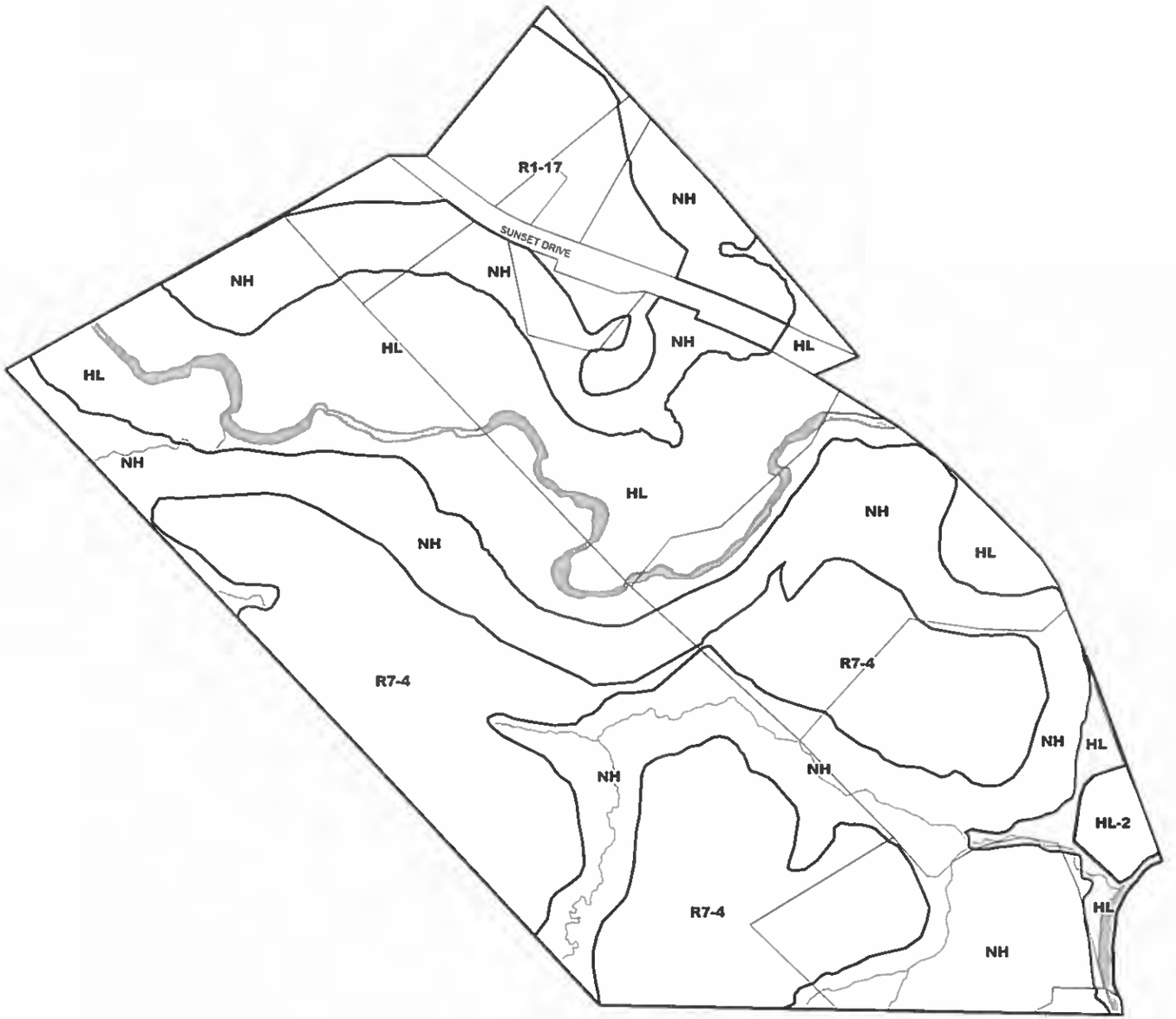
READ a First and Second time this day of , 2020.

READ a Third time and FINALLY PASSED this day of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor

DRAFT

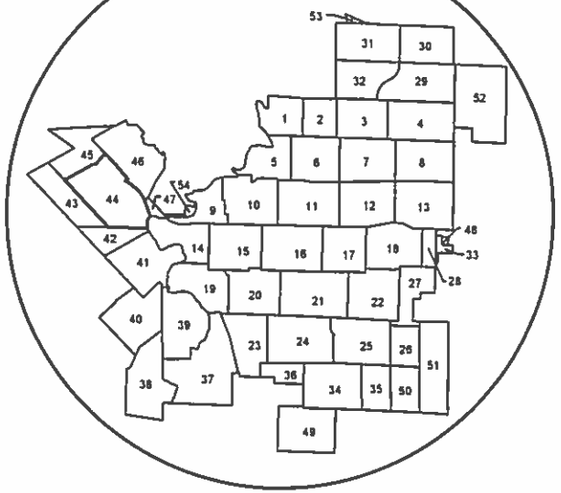


This is Schedule "A"
to By-Law
Passed this Day
of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map

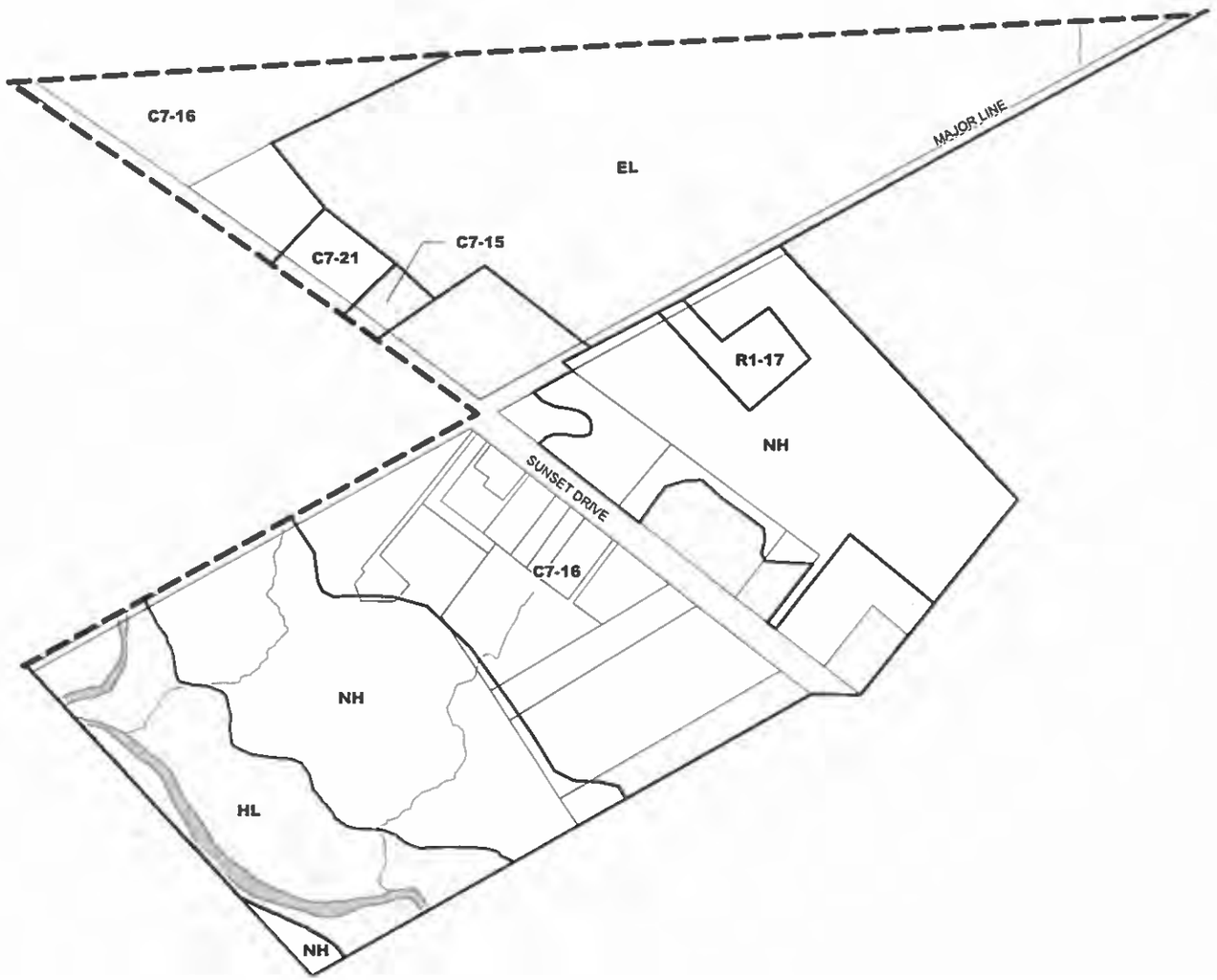


N

0 150 300

Metres

Zoning Map 44

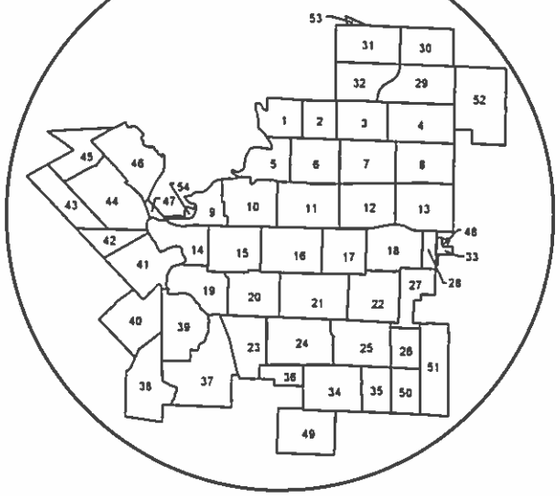


This is Schedule "B"
to By-Law
Passed this Day
of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map



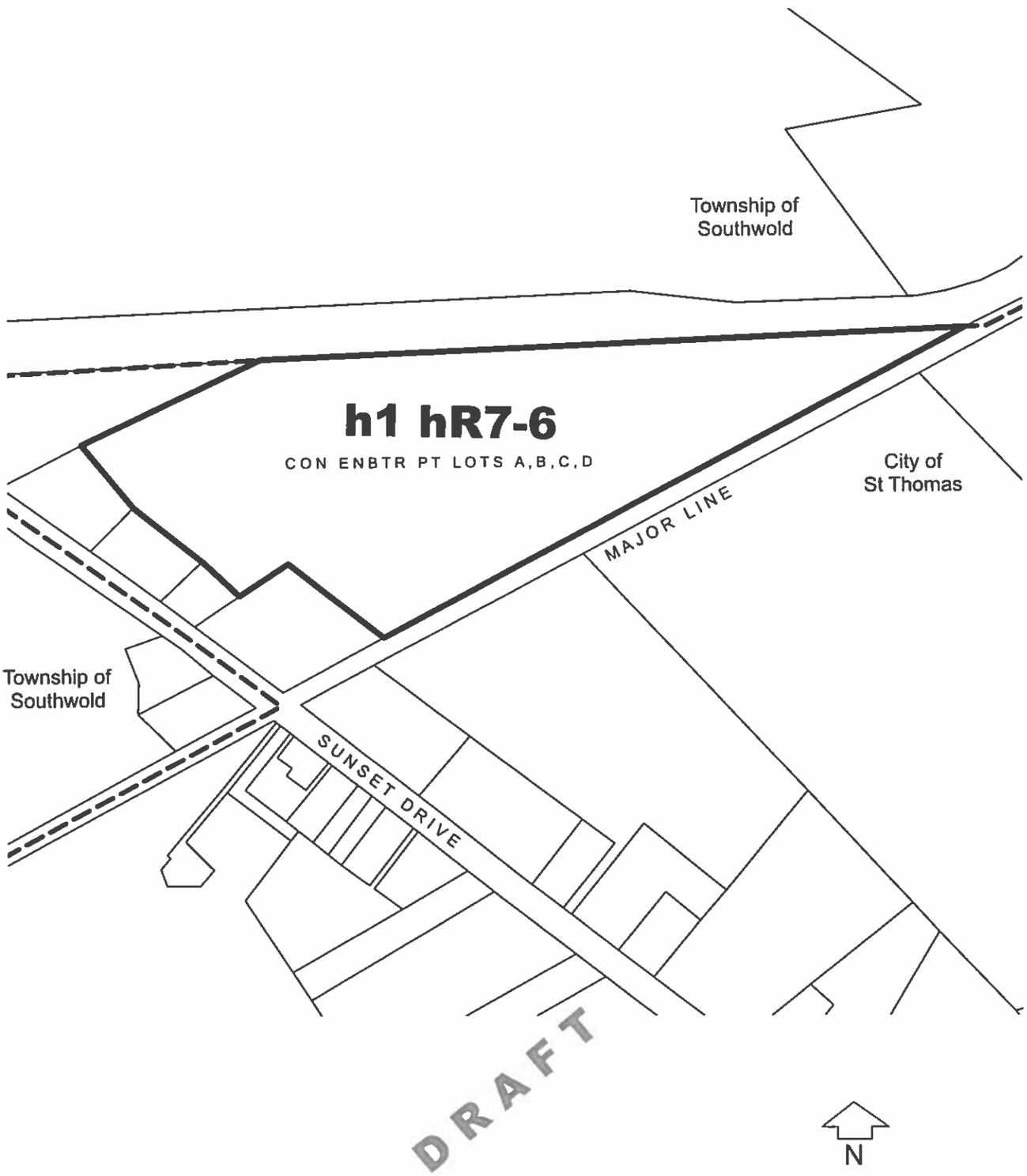
N

0 150 300

Metres

Zoning Map 45

Special Zoning Map 45-2

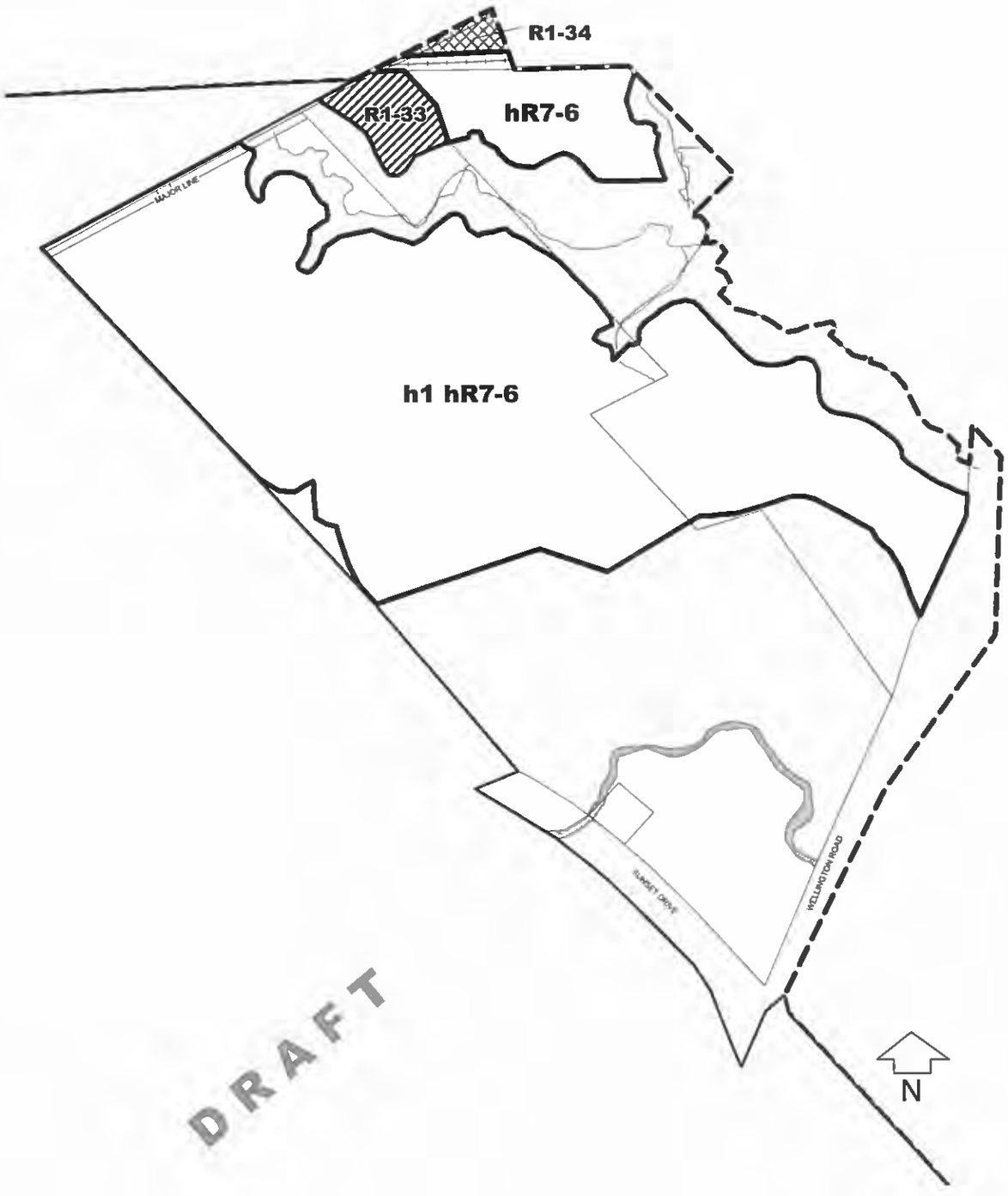


This is Schedule "C" to By-Law
Passed this th Day of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor

Special Zoning Map 46-1

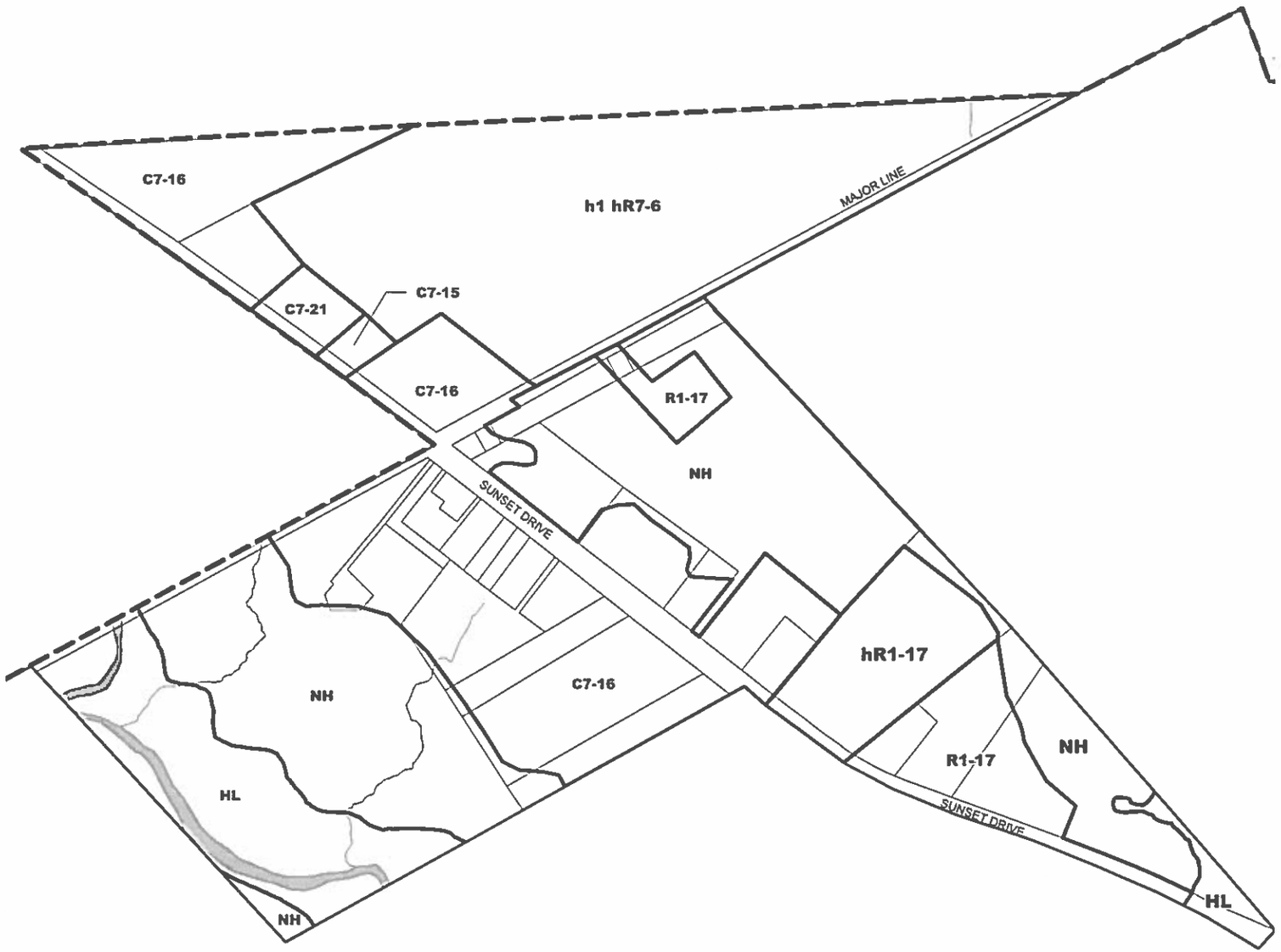


DRAFT

This is Schedule "D" to By-Law
Passed this th Day of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor



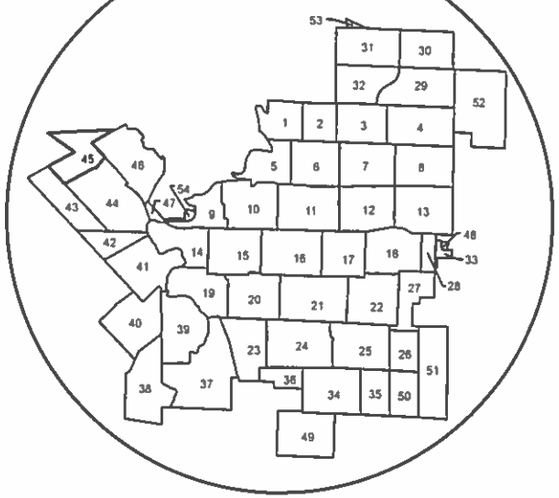
This is Schedule "E"
to By-Law
Passed this th Day
of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor

DRAFT

Key Map



N

0 150 300

Metres

Zoning Map 45



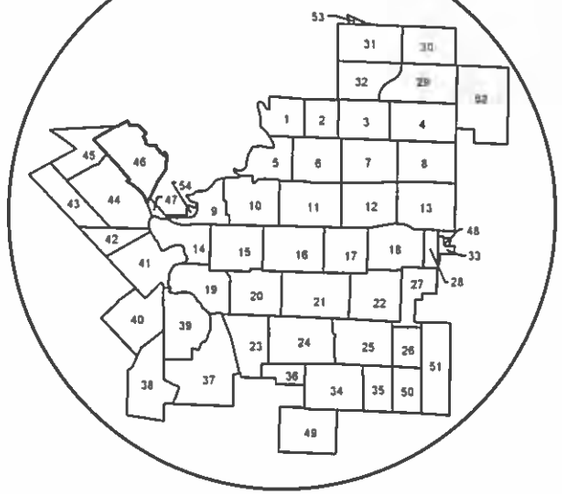
This is Schedule "F" to By-Law Passed this Day of , 2020.

Maria Konefal, City Clerk

Joe Preston, Mayor

DRAFT

Key Map



N

0 150 300

Metres

Zoning Map 46

APPENDIX VI

CONCURRENT IMPLEMENTING ZONING BY-LAW AMENDMENT

CITY OF ST. THOMAS BY-LAW NO. 30-2021

CITY OF ST. THOMAS

BY-LAW NO. 30-2021

A By-law to amend By-law 50-88

THE COUNCIL OF THE CORPORATION OF THE CITY OF ST. THOMAS ENACTS AS FOLLOWS:

1. Zoning Map 44 to by-law 50-88 is hereby deleted.

2. Schedule "A" to this Bylaw is hereby adopted, and shall be known as Zoning Map 44 to By-law 50-88 as amended.

3. Zoning Map 45 to by-law 50-88 is hereby deleted.

4. Schedule "B" to this Bylaw is hereby adopted, and shall be known as Zoning Map 45 to By-law 50-88 as amended.

5. Zoning Map 45 to By-law 50-88 as amended is further amended by zoning the lands outlined in heavy solid lines on Schedule "C" hereto as "R7-6" and such Schedule shall be added to and form part of By-law 50-88 as amended and shall be known as "Special Zoning Map 45-2" to By-law 50-88 as amended.

6. Zoning Map 46 to By-law 50-88 as amended is further amended by zoning the lands outlined in heavy solid lines on Schedule "D" hereto as "R7-6", by zoning the lands shown hatched on Schedule "D" as "R1-33", and by zoning the lands shown cross-hatched on Schedule "D" as "R1-34", and such Schedule shall be added to and form part of By-law 50-88 as amended and shall be known as "Special Zoning Map 46-1" to By-law 50-88 as amended.

7. By-law 50-88 as amended is further amended by adding to subsection 11.3 the following paragraph:

"11.3.6 Special Zone

(a) Area Affected
R7-6 as shown on Special Zoning Map 45-2 and Special Zoning Map 46-1.

(b) Applicable Provisions
The provisions of subsections 11.1 and 11.2 and all other applicable provisions of this By-law shall apply to the area affected.

(c) Holding Zone Provisions
Subwatershed Study - To ensure that environmental concerns are addressed, the "h1" symbol shall not be deleted from the Zone until a scoped subwatershed study, or a scoped update to the Lynhurst Area Subwatershed Study (Dillon Consulting, April 1996), is completed to the satisfaction of the City for the area affected."

8. By-law 50-88 as amended is further amended by adding to subsection 5.5 the following paragraph:

"5.5.33 Special Zone

(a) Area Affected
R1-33 as shown on Special Zoning Map 46-1.

(b) Only Permitted Uses
Single detached dwelling
Home occupation
Accessory uses

(c) Only Permitted Buildings and Structures
Buildings and structures for the uses permitted by (b) of this paragraph 5.5.33.

(d) Services Required

In this special zone, the following requirements for services shall apply:

(i) Subject to (ii), no building or structure shall be erected or used for any purpose permitted by (b) of this paragraph 5.5.33 unless the following municipal services are available to service the building or structure and the land on which it is situate:

(1) a water supply system, and
(2) a sanitary sewage system and a storm system.

(ii) Buildings or structures may be used for any purpose permitted by (b) of this paragraph 5.5.33 if:

(1) a water supply system provided by the municipality or a well is available to service any building or structure and the land on which it is situate; and

(2) the sanitary waste from such building or structure is discharged to a sanitary waste disposal system approved by the City."

9. By-law 50-88 as amended is further amended by adding to subsection 5.5 the following paragraph:

"5.5.34 Special Zone

(a) Area Affected
R1-34 as shown on Special Zoning Map 46-1.

(b) Only Permitted Uses
Single detached dwelling
An electrical contracting business accessory to a single detached dwelling.
Accessory uses

(c) Only Permitted Buildings and Structures
Buildings and structures for the uses permitted by (b) of this paragraph 5.5.34.

(d) Services Required
In this special zone, the following requirements for services shall apply:

(j) Subject to (ii), no building or structure shall be erected or used for any purpose permitted by (b) of this paragraph 5.5.34 unless the following municipal services are available to service the building or structure and the land on which it is situate:

(1) a water supply system, and
(2) a sanitary sewage system and a storm system.

(ii) Buildings or structures may be used for any purpose permitted by (b) of this paragraph 5.5.34 if:

(1) a water supply system provided by the municipality or a well is available to service any building or structure and the land on which it is situate; and

(2) the sanitary waste from such building or structure is discharged to a sanitary waste disposal system approved by the City."

10. By-law 50-88 as amended is further amended by deleting subsection 2.2 and replacing it with the following:

"2.2 HOLDING ZONES

2.2.1 Use of Zone Symbol
Where the symbol "h" appears on a Zoning Map or on a Special Zoning Map as a prefix to

a Zone Symbol or Special Zoning Symbol, notwithstanding the provisions of that zone or special zone, unless this by-law has been amended to remove the relevant "h" symbol, those lands shall not be developed or used except for uses permitted by paragraph 2.2.2.

2.2.2 Permitted Interim Uses
Existing uses.

2.2.3 Holding Zone Provisions

(a) Plan of subdivision - to ensure the orderly development of lands, the "h" symbol shall not be deleted until a subdivision agreement is entered into for the lands in question with the City Corporation.

(b) Municipal Services - to ensure that there is sewage capacity for the lands in question, the "h" symbol shall not be deleted until the Director, Environmental Services and City Engineer certifies that in his opinion the City Corporation has adequate uncommitted reserve sewage capacity for the orderly development of the lands in question.

(c) Survey Requirements - where the limits of development abut or are in the vicinity of a Natural Heritage Zone (NH) or a Hazard Land Zone (HL), to ensure that such limits are adequately defined, the "h" symbol shall not be deleted until the Erosion Hazard Limit has been delineated to the satisfaction of the City Corporation and the Kettle Creek Conservation Authority.

(d) Environmental Impact Study - to ensure that all environmental concerns are addressed in respect of lands abutting or in the vicinity of a Natural Heritage Zone - NH, the "h" symbol shall not be deleted until an environmental impact study has been finalized in respect of such lands that is satisfactory to the City Corporation."

11. In anticipation of the eventual consolidation of By-law 50-88 and all amendments to such By-law, including this amendment, Schedule "E" to this Bylaw is hereby adopted, such Schedule being Zoning Map 45 to By-law 50-88 amended to include the changes made in such Zoning Map by all amendments to By-law 50-88 to date, including this amendment.

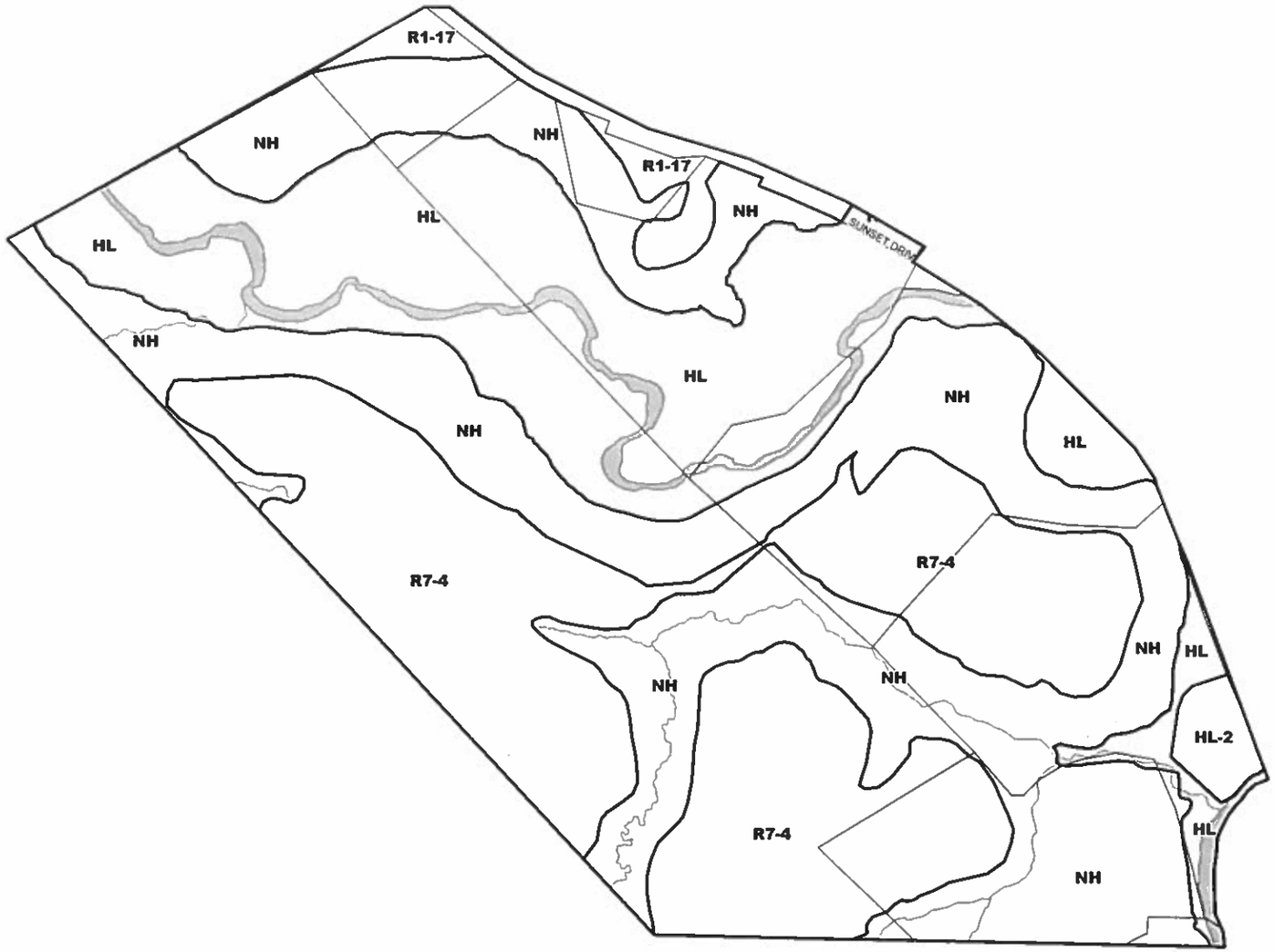
12. In anticipation of the eventual consolidation of By-law 50-88 and all amendments to such By-law, including this amendment, Schedule "F" to this Bylaw is hereby adopted, such Schedule being Zoning Map 46 to By-law 50-88 amended to include the changes made in such Zoning Map by all amendments to By-law 50-88 to date, including this amendment.

READ a First and Second time this 16th day of February, 2021.

READ a Third time and FINALLY PASSED this 16th day of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

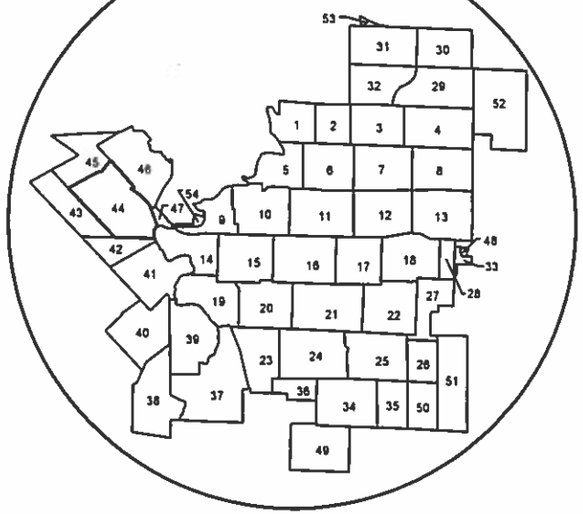


This is Schedule "A"
to By-Law 30-2021
Passed this 16th Day
of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map

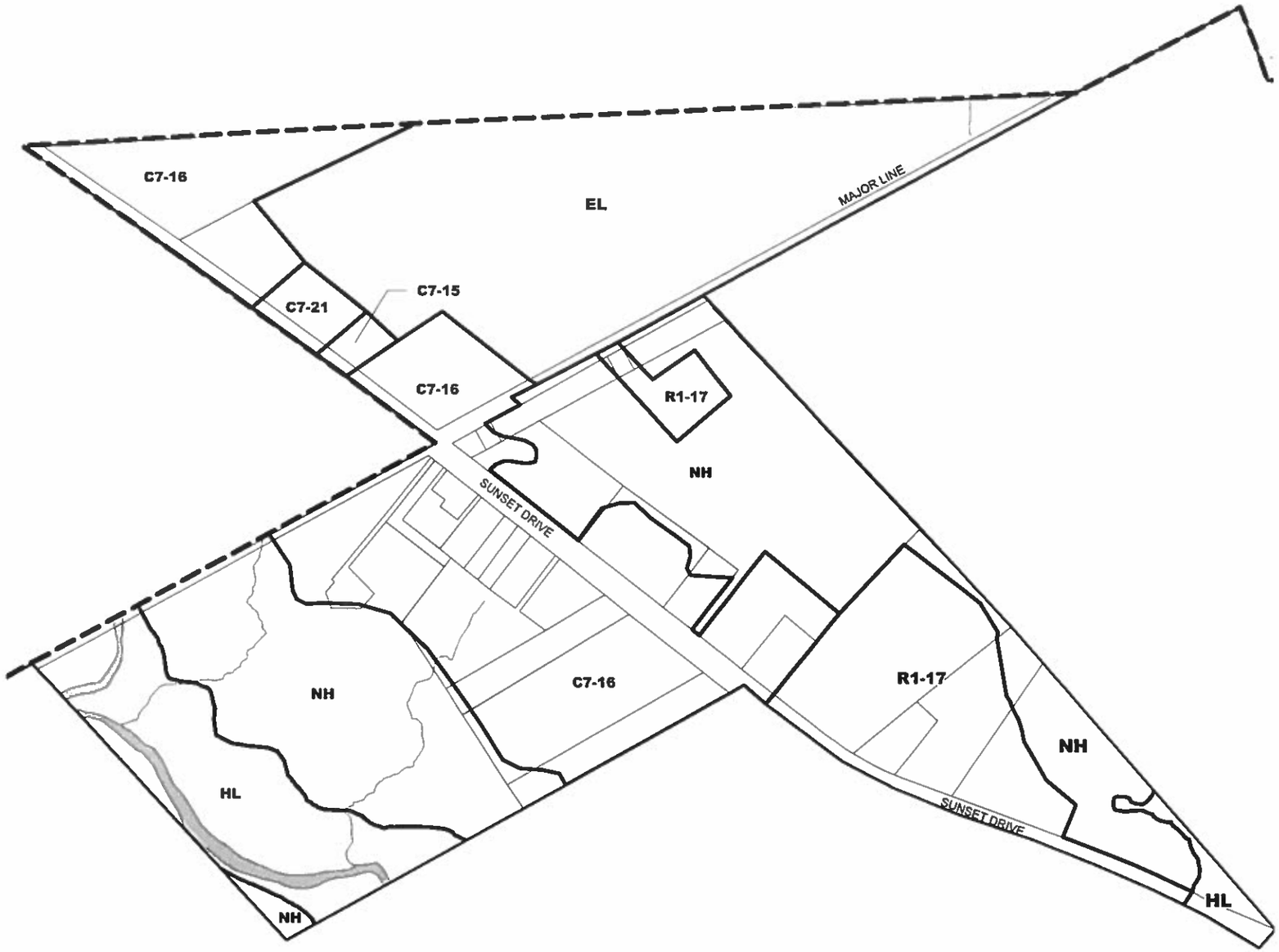


N

0 150 300

Metres

Zoning Map 44

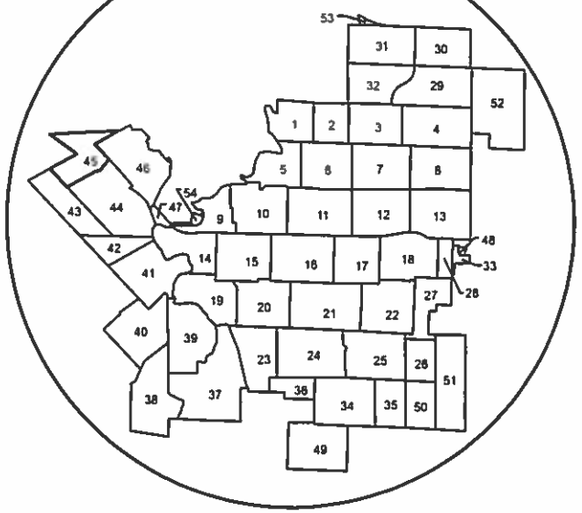


This is Schedule "B"
to By-Law 30-2021
Passed this 16th Day
of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map

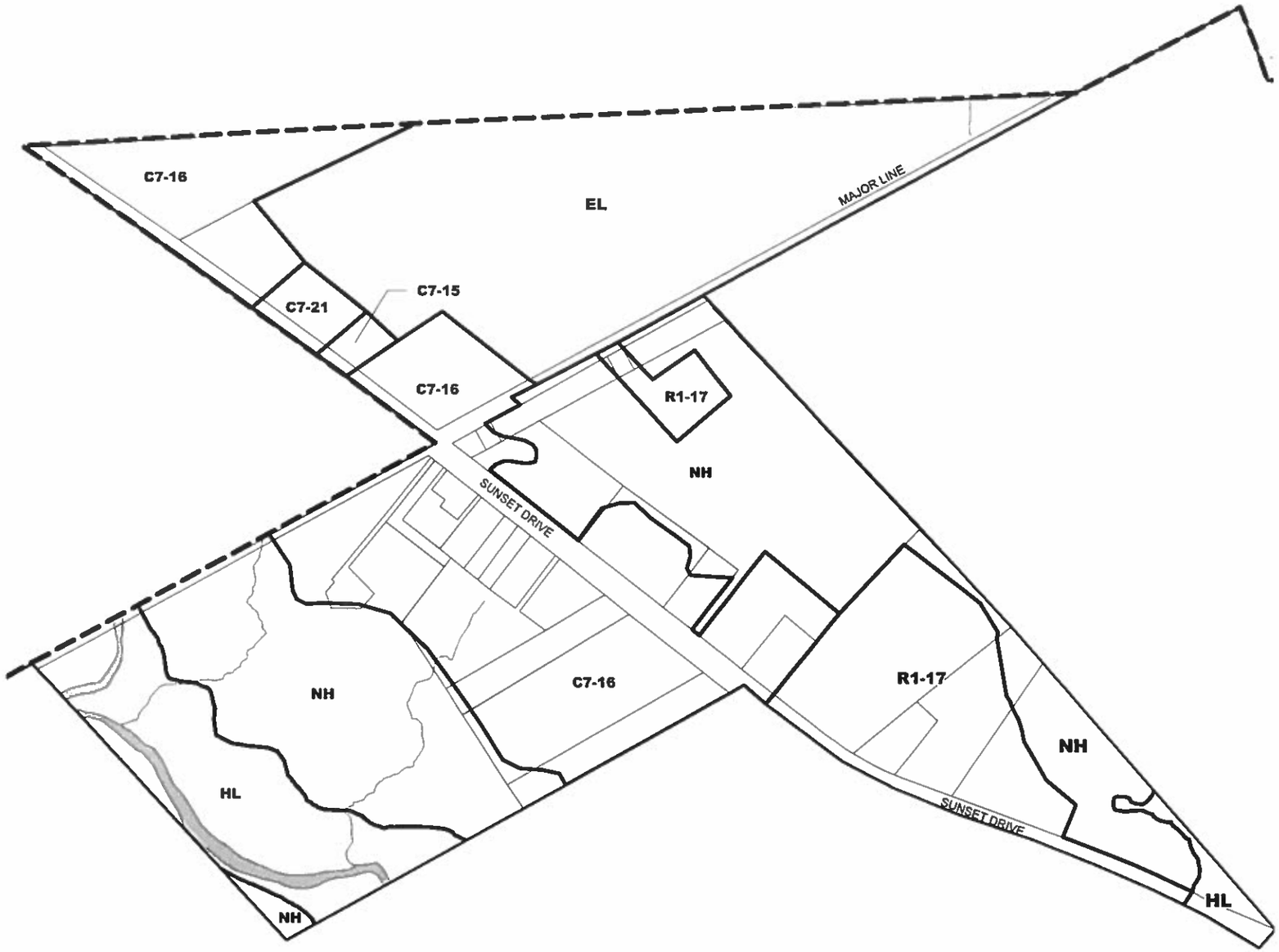


N

0 150 300

Metres

Zoning Map 45

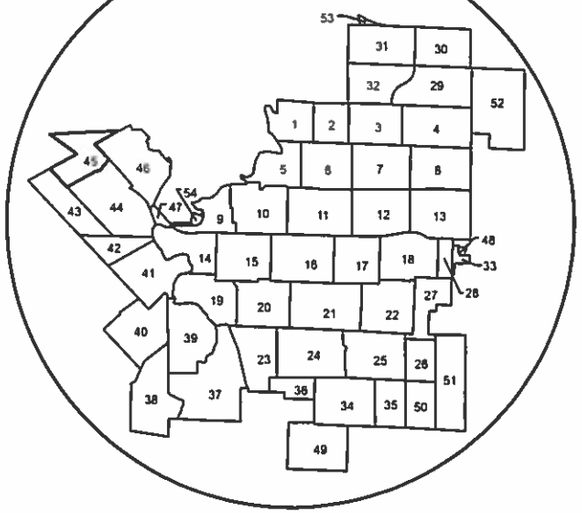


This is Schedule "B"
to By-Law 30-2021
Passed this 16th Day
of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map



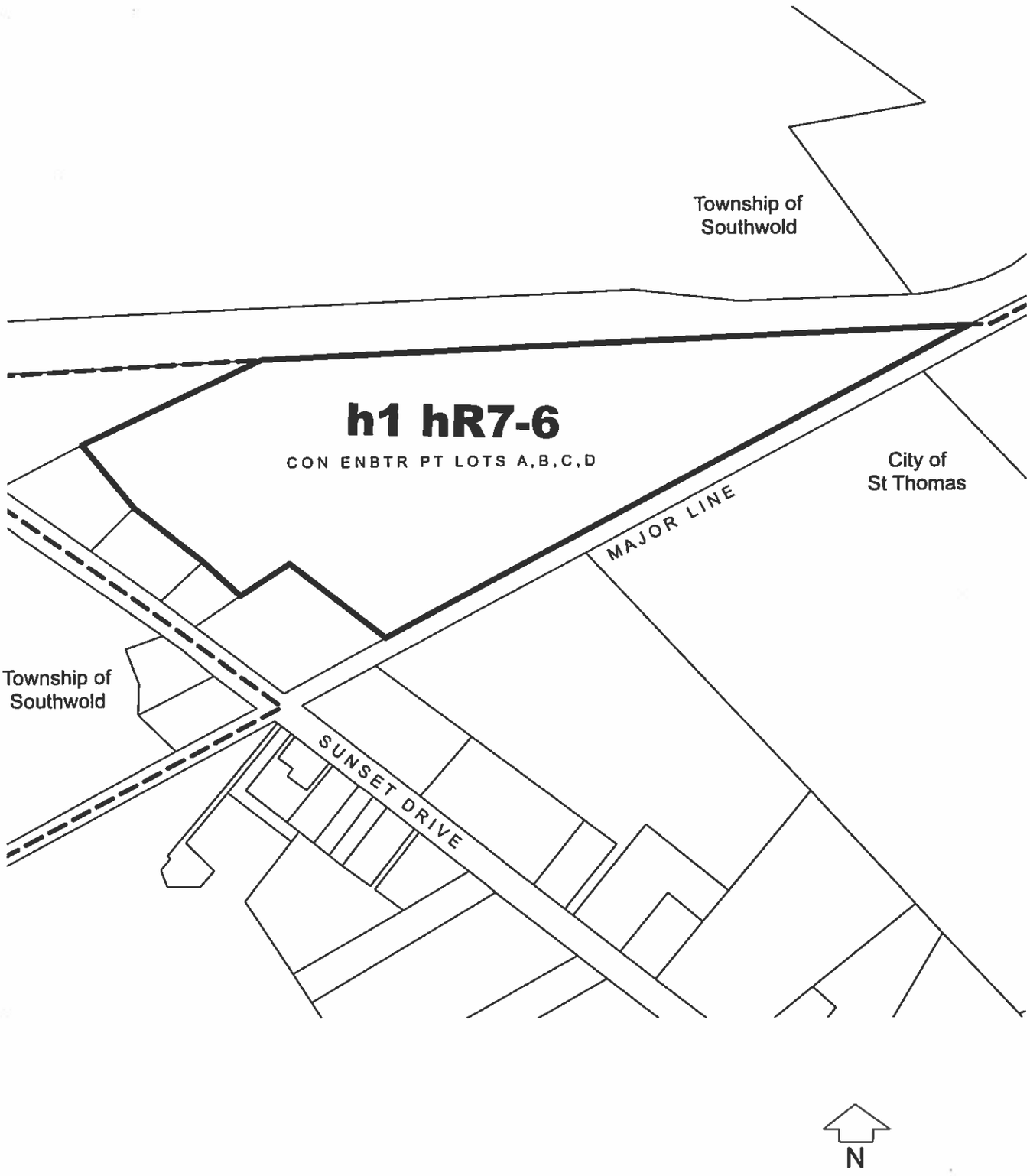
N

0 150 300

Metres

Zoning Map 45

Special Zoning Map 45-2



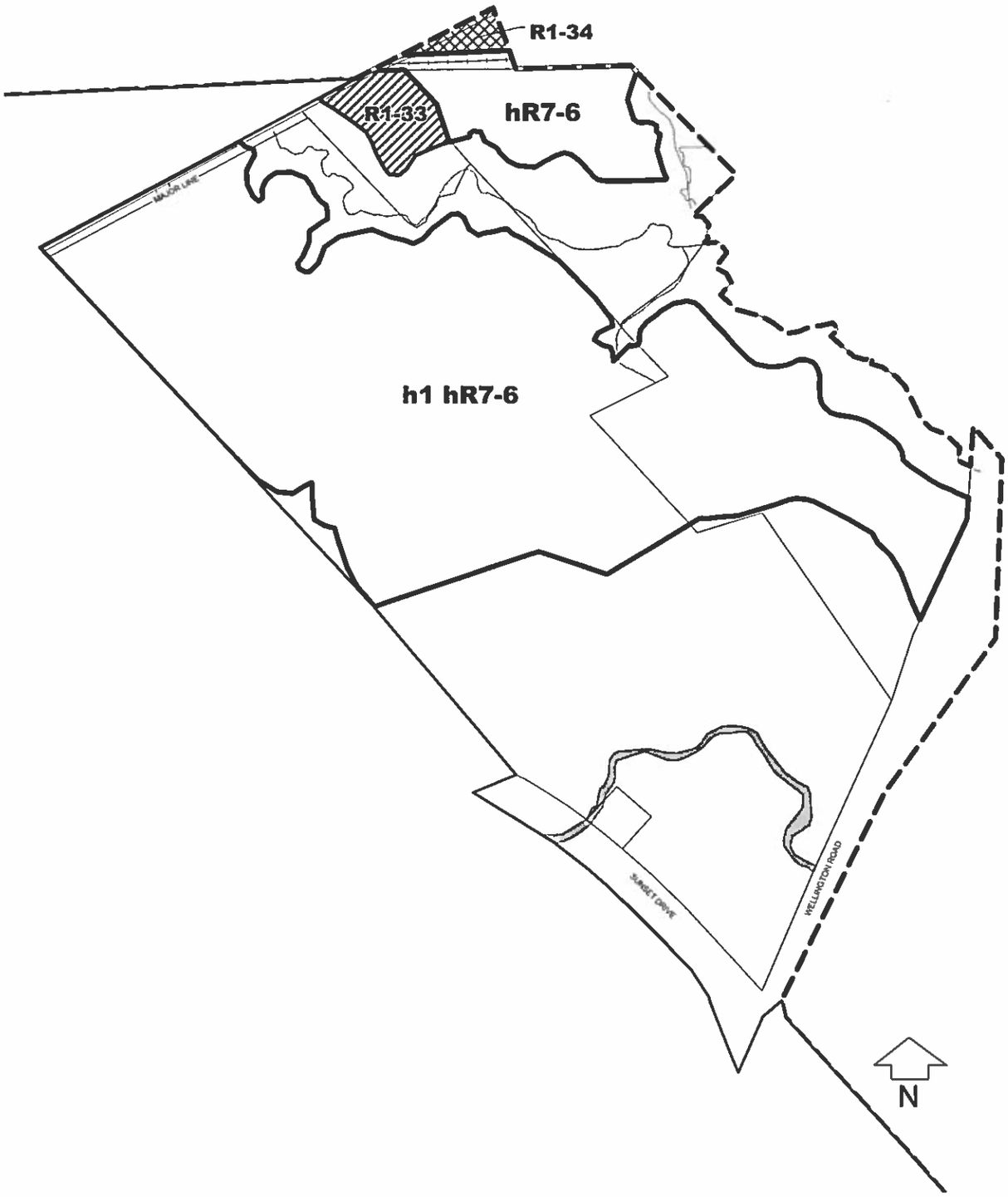
This is Schedule "C" to By-Law 30-2021
Passed this 16th th Day of February, 2021.

Maria Konefal

Maria Konefal, City Clerk

Joe Preston, Mayor

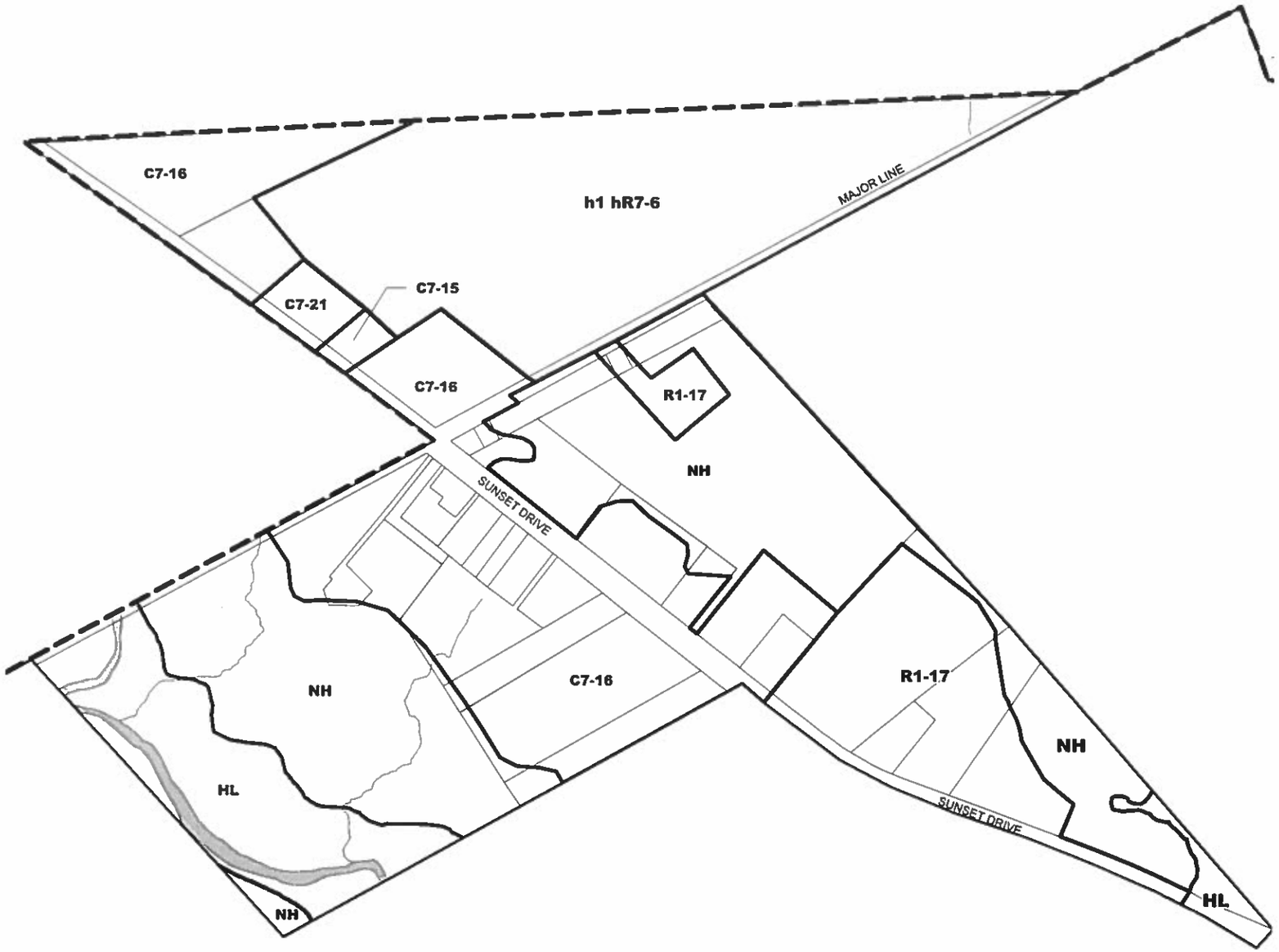
Special Zoning Map 46-1



This is Schedule "D" to By-Law 30-2021
Passed this 16th Day of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

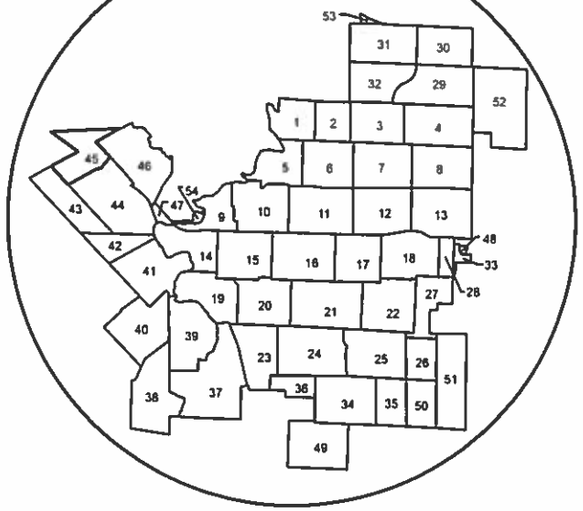


This is Schedule "E"
to By-Law 30-2021
Passed this 16th Day
of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map

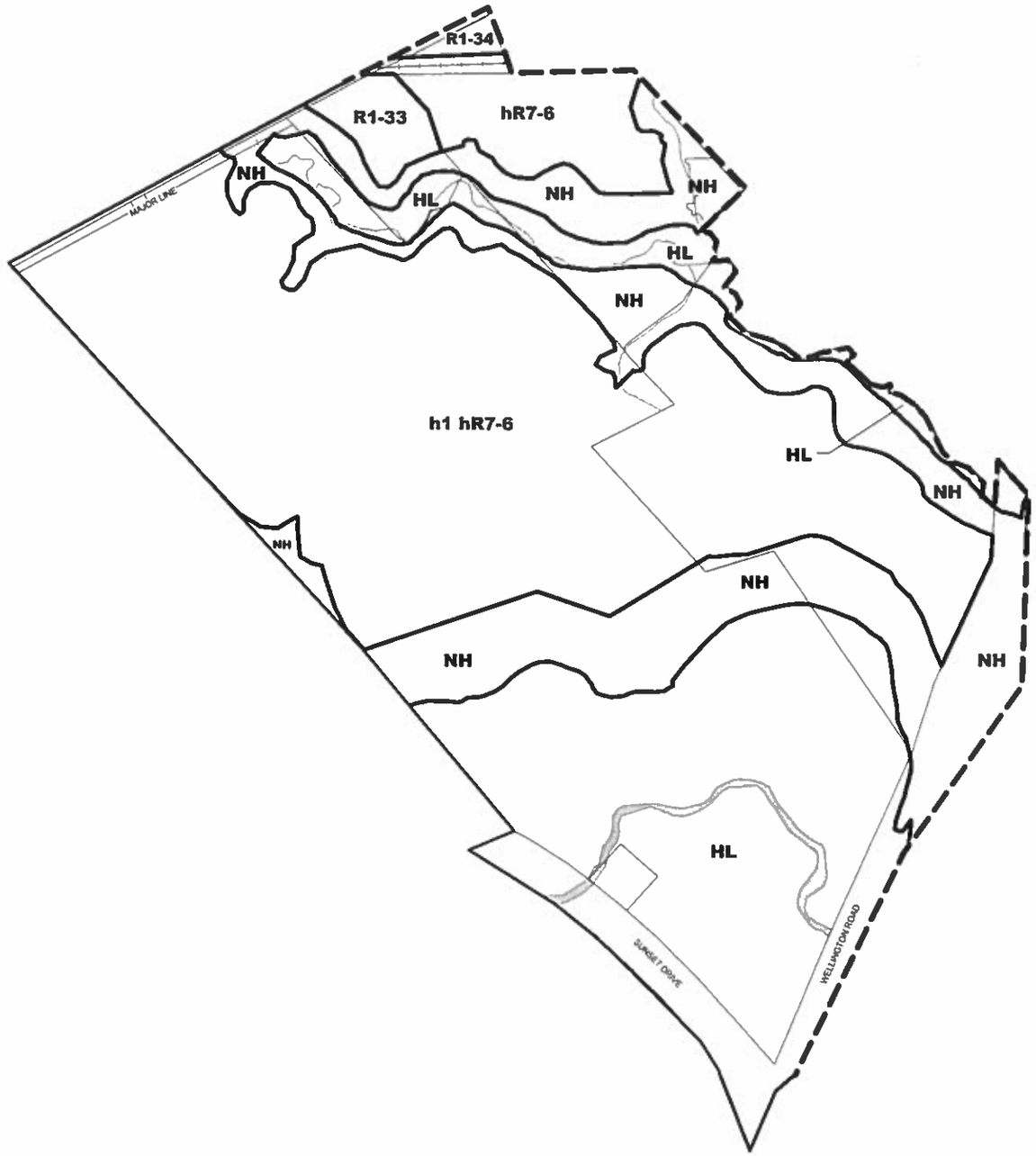


N

0 150 300

Metres

Zoning Map 45

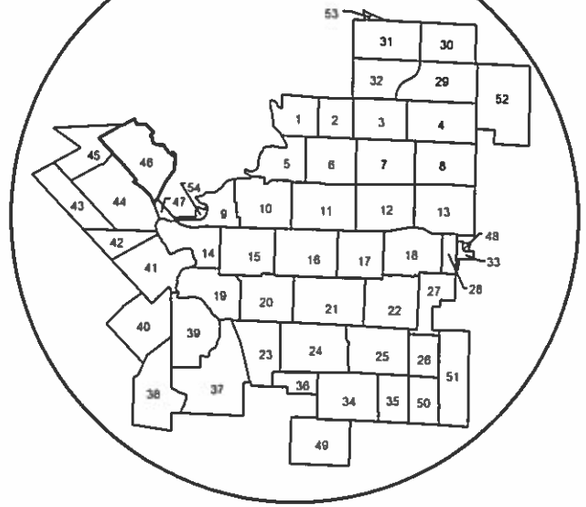


This is Schedule "F"
to By-Law 30-2021
Passed this 16th Day
of February, 2021.

Maria Konefal, City Clerk

Joe Preston, Mayor

Key Map



N

0 150 300

Metres

Zoning Map 46