DILLON CONSULTING

SANDWICH SOUTH MASTER SERVICING PLAN

City of Windor

Sandwich South Master Servicing Plan

Final

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Acronyms, Abbreviations, Definitions

Definitions

Term	Description
Climate Change	Climate change is the shift in weather patterns associated with an increase in global average temperatures.
Design Storm Event	A representative rainfall event that does not necessarily match a real or actual rainfall, but is used to assess sewer and drainage system performance. The design storm event corresponds to a certain return period frequency (e.g. 1 in 5 year, 1 in 100 year).
Drainage Area	The total surface area upstream of a point where stormwater runoff or sanitary drainage is conveyed to the same point.
Dry Weather Flow	Wastewater flow in a sewer system during periods of dry weather (without precipitation) with minimum infiltration.
EA (Environmental Assessment)	In the context of this document the MEA Municipal Class EA, is an approved planning process for municipal infrastructure that can be uses to meet the requirements of the Environmental Assessment Act (EAA). The Municipal Class EA process was last revised in March 2023.
Extraneous Flow	Unintended clean stormwater or groundwater that gets into the sanitary sewer system, also commonly referred to as "inflow and infiltration (I&I)".
Hydraulic Gradeline (HGL)	The surface or profile of water flowing in an open channel, on the ground surface, or a sewer pipe flowing partially full. If a sewer is under pressure, the HGL is that level water would rise to in a small, vertical tube connected to the pipe.
Impervious Area	Mainly artificial surfaces, such as pavements (roads, sidewalks, driveways and parking lots) and rooftops, over which stormwater is forced to travel across until it finds a place it can be collected and conveyed by a storm drainage system. Impervious surfaces allow for no to very limited infiltration.

Definitions

Term	Description
Inflow & Infiltration (I&I)	See extraneous flow. This could include unintended clean water entering the sewer under both dry weather (i.e. groundwater infiltration) or from wet-weather (rainfall derived conditions). The inflow component generally includes quicker moving water sources such as improper cross-connections with the storm sewer system or from surface drainage through maintenance hole lids. The infiltration component generally includes slower moving water sources such as groundwater entering through cracks, unsealed pipe joints and other defects in the underground pipe network.
Master Plan	Master Plans are long range plans that integrate infrastructure requirements for existing and future land uses with environmental planning principles. This study is being completed to meet the requirements of the Municipal Class Environmental Assessment (EA), Master Plan Process (Approach No. 2).
Major System	Overland conveyance system for rainfall runoff typically defined by the road right-of-way.
MEA (Municipal Engineers Association)	An association of Ontario public sector Professional Engineers performing various roles within the field of municipal engineering.
Minor System	Conveyance system for stormwater drainage (i.e. storm sewer system).
Outfall Level	The water level at location where water leaves the model drainage system.
Peak Flow	Maximum rate of flow.
PIC (Public Information Centre)	A public event which is used to educate and inform the public as well as to elicit feedback from the study. This is a necessary step in the Class EA process and typically conducted at study milestones.
Previous Area	Land surface representing permeable surfaces that allow the infiltration of rainfall into the ground. These areas include lawns, gardens, and forests.

Definitions

Term	Description
Pumping Station	A facility compromised of pumps which help lift and distribute Stormwater when gravity will not naturally transfer it away from a location.
Return Period	An estimate commonly based on records of past observation for how likely an event, such as rainfall or flood is to occur in any given year. For example, a 1 in 100-year storm event has a 1 in 100 chance (or a 1%) of occurring in any given year.
Sanitary Sewer	A network of pipes that convey liquid and solid waste (wastewater) from domestic or industrial establishments (sewage) to the City's wastewater facilities for treatment before being discharged to the Detroit River.
Service Area	The total surface area upstream of a point contributing flow that is conveyed to that point. This could include storm sewer, sanitary sewer or combined sewer systems' areas.
Storm Sewer	A network of pipes that convey stormwater runoff from lower intensity rainfall events to receiving watercourses. Storm sewers are also known as the "minor" component of the storm drainage system, and function in combination with the "major" overland drainage system during more significant storm events.
Subcatchment	A defined land area used to model rainfall runoff. Each sub-catchment generates a hydrograph that is typically routed to downstream watercourse, waterbody or other conveyance structure.
Watermain	A network of pipes that convey water to homes and businesses.
Wet Weather Flow	The rate of wastewater flowing during dry weather combined with stormwater from surface runoff due to precipitation introduced into a combined sewer system, and dry weather flow combined with infiltration & inflow in a separated sewer. For separate storm sewers, only wet weather flow is conveyed through the system.

Executive Summary

In order to accommodate the City of Windsor's projected growth, the Town of Tecumseh transferred 2,600 hectares (ha) of land in the former Township of Sandwich South to the City of Windsor in 2002. Sandwich South is the planning area that is located in the south east portion of the City of Windsor and is maintain comprised of agricultural land use with some industrial and residential land uses. To support growth, the City has completed the Sandwich South Master Servicing Plan (SSMSP) which intends to aid with the development of a coordinated and sustainable approach to providing municipal infrastructure to the area.

This Plan considers the location and capacity of collector roads, storm and sanitary sewers, watermains, how stormwater will be managed and how natural environment linkages will be maintained throughout the Study Area. The SSMPS has been undertaken to in accordance with the Municipal Class Environmental Assessment (MCEA) (2015/2023). Public engagement was also considered for this Master Plan to ensure that those who might be interested or affected by the SSMSP are provided the opportunity to participate in its development.

The Sandwich South Area is comprised of various internal planning Servicing Plan areas including East Pelton Secondary Plan Area, County Road 42 Secondary Plan Area, and Windsor International Airport area. Currently, the land is primarily rural, but includes the Windsor Airport and some residential and commercial uses. This zone was designated for future growth over the next 20 plus years by the City. Growth will include a variety of residential, commercial, institutional and industrial land uses.

A population forecast (Hemson, 2020) predicted that Windsor will experience a population growth of at 14,210 and an increase of 4,999 dwelling units and an employment growth of 9,486 jobs by 2041, anticipating the majority of the employment growth to occur within the Sandwich South Planning District. Subsequent to that estimate, the construction of a large-scale Electrical Vehicle Battery Plant has commenced on Banwell Road, south of CR22 which results in an increase in the 2020 projections to account for this facility and potential supporting feeder plants.

In order to support development, it is necessary to put in place measures for managing stormwater that can both provide local drainage control and prevent an increase in

flood risk downstream resulting from changes to runoff and greater surface impermeability in the area. The Sandwich South Area is currently being serviced via municipal and roadside drains and there are no existing Trunk Storm Sewers. The proposed solution suggests the construction of 14.5 kilometre (km) of Trunk Storm Sewers to ensure proper servicing in the future.

The proposed stormwater management (SWM) facilities are required to provide control of runoff from the new development areas. The SWM system will consist of eight stormwater management ponds with their respective pumping stations outletting to existing drainage channels within the upper Little River Watershed. The use of wet versus dry ponds were evaluated within this study to assist with mitigation of waterfowl habitat due to the proximity of these facilities to the existing Windsor International Airport. For the stormwater management facilities that are within the Airport's Primary Hazard Zones (Pond P1 and Pond P3 and potentially Pond P6), dry Ponds were selected to decrease the attractiveness of the ponds to waterfowl. It is imperative that under any scenario, implementation of a maintenance and monitoring plan is adhered to, to ensure that hazards are identified early and addressed immediately.

In 2006 (Addendum 2014), Stantec Consulting Ltd. prepared a sanitary sewage plan which provided the framework for the sanitary servicing of a region that included the Sandwich South Area. From that system, 10.5 km of trunk sanitary sewers have already been built. An additional approximately 8.7 km of Trunk Sanitary Sewers are proposed to maximize sanitary servicing for the Sandwich South Area.

All the resulting sanitary sewage is currently treated at the Little River Pollution Control Plant (LRPCP) and the Lou Romano Water Reclamation Plant (LRWRP). However, through a high-level assessment, it was determined that in order to accommodate all planned future development within the Sandwich South area, the capacity of the LRPCP must be expanded. A portion of the SSMSP areas could develop prior to the LRPCP however it is recommended that the City proceed with a Schedule C Environmental Assessment to set the stage for those works.

An increase in traffic is expected, as a result of the development within the Sandwich South Area. To meet future transportation needs, the proposed solutions include but are not limited to:

- Development of an east-west collector traversing the full Study Area south of Joy Road south to connect with the East Pelton collector;
  - Widening of 8th and 9th Concession Road from 2 lanes to 4 lanes;
  - Expansion of Lauzon Parkway from 2 to 4 lanes from the CPR tracks to County Road 42, with eventual widening to 6 lanes;
  - Upgrading 7th, 8th, 9th, and 10th Concession Road with curbs, local stormwater drainage, active transportation facilities and other municipal services;
  - Construction of internal road network of collector roadways.
  - Traffic calming measures on Baseline Road between 7th Concession and 8th Concession Road.

Climate change was considered in the servicing plan for the Sandwich South Area in a variety of ways, such as, introducing an Active Transportation network and proposed Transit servicing expansion to support a more balanced modal split, utilizing a 1 in 10 year return period to size the proposed storm sewers which allow the system to be flexible to changes in climate, and dedicating land allowances for future a thermal heat distribution network. In addition to this, the Sandwich South area is planned to become a 'Net-Zero' Neighbourhood as part of a Sustainable Neighbourhood Action Plan (SNAP).

A number of solutions in the SSMSP require the acquisition of property and/or easements to accommodate the proposed infrastructure. Most notably, shared regional facilities such as collector road rights-of-way and stormwater management corridors. Over 103 Ha of land must be acquired from private owners to build the proposed Stormwater Management Facilities. Owners of required property will receive compensation based on a third-party land appraisal that will estimate land costs based on the most current market conditions at time of acquisitions.

Project implementation will occur in phases that will be based primarily on the necessary infrastructure to be constructed in order to support the development of the Sandwich South Area. The project prioritization in each phase should be reviewed frequently and in conjunction with any other planned City infrastructure works. In response to current development demands, the City will proceed with the implementation of identified improvements within the next approximately 5-year time frame (**Table I**).

Table I: 5-year Horizon Project Implementation Recommendations

Project Title	Project Description
Schedule C Roadway Environmental Assessment	
Collector Road Widening Environmental Assessment - Schedule C	8th Concession Corridor from CR 42 to the EW Arterial Road.
	9th Concession Corridor from CR 42 to the EW Arterial Road.
Transportation	
Lauzon Parkway/CR42 Intersection Improvements	Realignment of Lauzon Parkway between Service Road B and CR42.
CR42 Intersection Improvements	CR42 reconstruction, Lauzon Parkway to the City Boundary.
9th Concession Road	Improvements to 9th Concession Corridor - From County Road 42 to Baseline Road. (0.9 km)
7th Concession Road	Improvements to 7th Concession Corridor - From County Road 42 to the Future E-W Arterial Road. (1.2 km)
Sanitary	
9th Concession Sanitary Trunk Sewer	Construct sanitary trunk sewer along 9th Concession Road from County Road 42 to Baseline Road (0.9 km). Required to serve the Regional Hospital Facility.
Stormwater Management Servicing- Lauzon Parkway and CR 42 Intersection	
P7 Drainage Area - East of Lauzon Parkway, north of CR42	
P7 SWM Pond	Construct receiving pond.
P7 Pump Station	Construct storm pump station.
P7 Trunk Storm Sewer on CR42 and Lauzon Parkway	Construct trunk storm sewers servicing the local roadway and discharging to P7 pond.
P8 Drainage Area - West of Lauzon Parkway, north of CR42	
P8 SWM Pond	Construct receiving pond. Pond construction may be phased to serve the initial Lauzon Parkway reconstruction. The remainder of the airport development lands are not anticipated to develop immediately.
P8 Pump Station	Construct storm pump station. Pump station configuration may be staged based on the phased implementation of the pond storage capacity.
P8 Trunk Storm Sewer - Lauzon Parkway	Construct trunk storm sewers along the Lauzon Parkway from Service Road B to P8.

Project Title	Project Description
P8 Trunk Storm Sewer - CR42	Construct trunk storm sewers along the CR42, between 9th Concession and Outlet to P8.
Municipal Drains	
6th Concession Drain Realignment	Relocate 6th Concession Drain from 7th Concession Road to 8th Concession Road. (1.4 km) to be incorporated recommended through a Drainage Report being prepared by Baird AE.
6th Concession Drain Improvements	Repairs to the existing 6th Concession Drain (2.0 km) being recommended through a Drainage Report being prepared by Baird AE.
7th Concession Drain Realignment (E-W Arterial Drain) Construction	Install E-W Municipal Drain from 7th Concession Road to Little River. Decommission 7th Street Drain Diversion (2.9 km)

The cost estimate of the proposed infrastructure is broken down into the phases mentioned above and the Secondary Plan Areas. Cost associated with the maintenance of the infrastructure is not included in the cost estimate. Below is a summary of the estimated cost associated with each phase of the solution;

- 5-year horizon - $37.5M
- Phase 1 (East Pelton) - $108.7M
- Phase 1 (CR42 SPA) - $221.4M
- Phase 2 (East Pelton) - $49.6M
- Phase 2 (CR42 SPA) - $296.9M

The City's intention is to have the developers pay the full cost to develop the infrastructure necessary to service the Study Area, and the City contribute to the cost for infrastructure facilities that will serve area beyond local servicing areas. Cost associated with the maintenance of the infrastructure is not included in the cost estimate.

The completion of this Master Plan document will be communicated to the stakeholders and agencies through the issuing of a Notice of Completion. A 30-day review period for which the City will received comments related to this study will commence at that time. Issuance of this report and approval will allow the implementation of all Exempt projects and those designated as Schedule B projects. Below is a list of those projects.

Table II: Schedule B Project List

Project	Description
East Pelton Secondary Plan Area	
P1 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a dry receiving pond (P1), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
P2 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a wet receiving pond (P2), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
County Road 42 Secondary Plan Area	
P3 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a dry receiving pond (P3), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
P4 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a wet receiving pond (P4), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
P5 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a wet receiving pond (P5), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
P6 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a wet receiving pond (P6), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
P7 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a wet receiving pond (P7), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.
P8 SWM Pond, Pump Station and Outlet to Municipal Drain	Construct a wet receiving pond (P8), landscaping and maintenance pathway. Construct a pump station, a pond outlet, and a stand-by power generator.

1.0 Introduction

1.1 Project Scope

The City has initiated this Master Servicing Plan (SSMSP) for the Sandwich South Area to develop a coordinated and sustainable approach to providing municipal infrastructure in support of growth. This Plan will consider the location and capacity of collector roads, storm and sanitary sewers, watermains, how stormwater will be managed and how natural environment linkages will be maintained throughout the Study Area. The SSMPS has been undertaken to in accordance with the Municipal Class Environmental Assessment (MCEA) (2015). Through the evaluation of alternatives, the SSMSP will identify the location and capacity of collector roads, storm and sanitary sewers, and stormwater management facilities. These solutions will be implemented over the next 20 years as development occurs.

This report will include the appendix reports detail that transportation, stormwater management analysis and functional design studies completed for the area, including evaluation of existing infrastructure, analyses and design of the roadways, trunk storm and sanitary sewers, trunk watermains, and stormwater management (SWM) facilities required for the initial buildout areas. The objective is to obtain a list of proposed projects that may be implemented by the City or initiated by Developers. This document will assist with the planning and budgetary allocation required to proceed with servicing of this area.

1.2 Project Objectives

Early community consultation for this project identified a number of key objectives that need to be evaluated. These objectives have been used to guide the project and formed the basis of the criteria for the evaluation of alternatives. The potential effects of the project and mitigation proposed were also checked against the project objectives. The following lists the project objectives developed for the SSMSP:

Manage flood risk

Limiting development in high risk areas and reducing flooding to homes and businesses.

Protect quality of life

Consider the existing community and landowners.

Be cost effective and provide value

Consider the cost to the taxpayer when funding new development and infrastructure.

Protect the natural environment

Consider the natural environment during developments throughout the Study Area.

Support the creation of a complete community

New development should be a complete/self-sufficient community that provides live/work opportunities, fosters vibrant public interaction, and give residents and workers a sense of place.

Protect health and safety

Health and safety should be considered with new developments and infrastructure.

Align with existing infrastructure and studies

Consider compatibility with other planning efforts. Incorporate previous studies, results and recommendations.

Build in resiliency

Concerns for environmental impacts of developments on climate change, such as changes in air quality, emissions and increased flooding.

Build in flexibility

Provide clarity around phasing. Remain flexible and adaptable to changes to the alternative.

Key questions that are considered to evaluate alternatives under each of these objectives are included in **Section 5.0** below and in **Appendix G Municipal Servicing Alternative and Preferred Option Supplemental Summary.**

1.3 Report Structure

This report consists of the following sections:

- **Section 1.0** presents an introduction to the plan, some background, the purpose and approach, the objectives, and a description of the Study Area;
- **Section 2.0** presents the EA process;
- **Section 3.0** describes the stakeholder and public engagement employed, including approach and objectives, engagement activities, and a summary of the feedback and how it mattered;
- **Section 4.0** provides a description of the existing environment, which includes: natural environment, socio-economic environment, infrastructure, and climate change;
- **Section 5.0** provides an overview of the Problem and Opportunity of this project and outlines the solutions considered;
- **Section 6.0** outlines the potential effects and mitigation, practical tools for implementation, and costs; and,
- **Section 7.0** provides an overview of the recommendations.

1.4 Study Area Context

The Study Area is generally bounded by 7th Concession Road to the west, the City of Windsor Municipal City Limits to the east, Highway 401 to the south and the northern limit of the Windsor Airport Lands to the north (see **Figure 1-1** below). The Study Area is primarily rural, but includes the Windsor Airport and some residential uses.

The City has designated this area for future growth over the next 20 plus years. Growth will include a variety of residential, commercial, institutional and industrial land uses.

The Study Area includes the CR42 SPA, the East Pelton Secondary Plan Area as well as the southeast portion of the Windsor Airport Lands, which provide direction and phasing for development in these areas. The Master Servicing Plan for the Sandwich South Study Area will incorporate the objectives of these plans.

1.5 Project Background

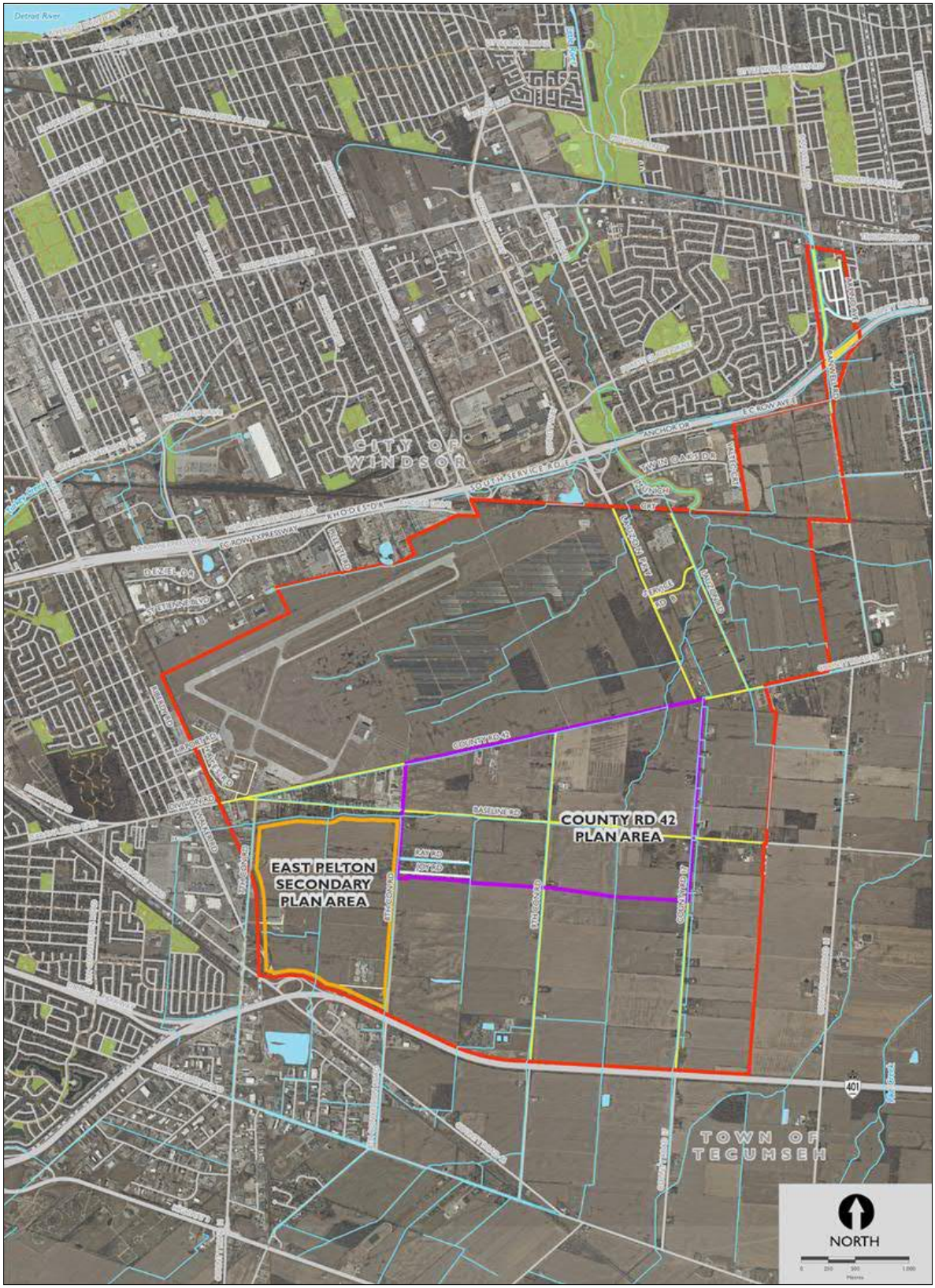
To meet the future growth needs of the City of Windsor (City), 2,600 hectares of land in the former Township of Sandwich South were transferred from the Town of Tecumseh to

the City of Windsor in 2002 (“Sandwich South Lands”). At the time of the transfer, the Sandwich South Lands were almost entirely agricultural in nature with small areas of residential and industrial uses. The lands were transferred for the purpose of satisfying the future growth needs of the City. Since then, the areas have not changed significantly however to meet the growing needs of the City of Windsor, development of this area is expected.

The Sandwich South Lands are comprised of various internal planning areas including East Pelton Secondary Plan Area, County Road 42 Secondary Plan Area, and Windsor International Airport area. Current and future development patterns within these areas have been studied and are documented in Secondary Plan reports and Master Plans which are described in more detail below. Municipal Servicing Environmental Assessments have also been completed to establish the necessary arterial road and watershed drainage infrastructure required to serve future development. Refer to **Section 1.5.1** to **Section 1.5.9** for more details.

The Plan will build upon the completed Secondary Plans, engineering reports and Municipal Class Environmental Assessments (MCEA) that have been completed for the Sandwich South Lands previously. A summary of related reports is included in **Section 1.7** including commentary on how the outcomes of those reports have fed into the completion of this Sandwich South Master Servicing Plan (SSMSP).

Figure 1-1: Sandwich South Master Servicing Plan Study Area



1.5.1 Sandwich South Master Planning Study and Official Plan Amendment (OPA) 60

A Master Planning Study was initiated for the Sandwich South Lands in 2004, which resulted in Official Plan Amendment 60 ("OPA 60"). The study was completed in 2006 and approved by the Ontario Municipal Board ("the Board") in 2007. OPA 60 established the overall land area requirements and general location of various land use categories to accommodate future growth. As shown on **Figure 1-2**, Schedule D: Land Use, the area was predominantly re-designated from 'Agricultural' lands in the Town of Tecumseh Official Plan to 'Future Urban Area' in the south and east portions, and 'Future Employment Area' in the north and west portions. In addition, two north-west 'Open Space' corridors were designated in the eastern and western halves of the area, as well as adjacent to Baseline Road in the southern portion. Two 'Natural Heritage' nodes were designated in the middle of the eastern and western halves of the Sandwich South Lands.

Figure 1-2: Schedule D - OPA#60 Land Use Plan

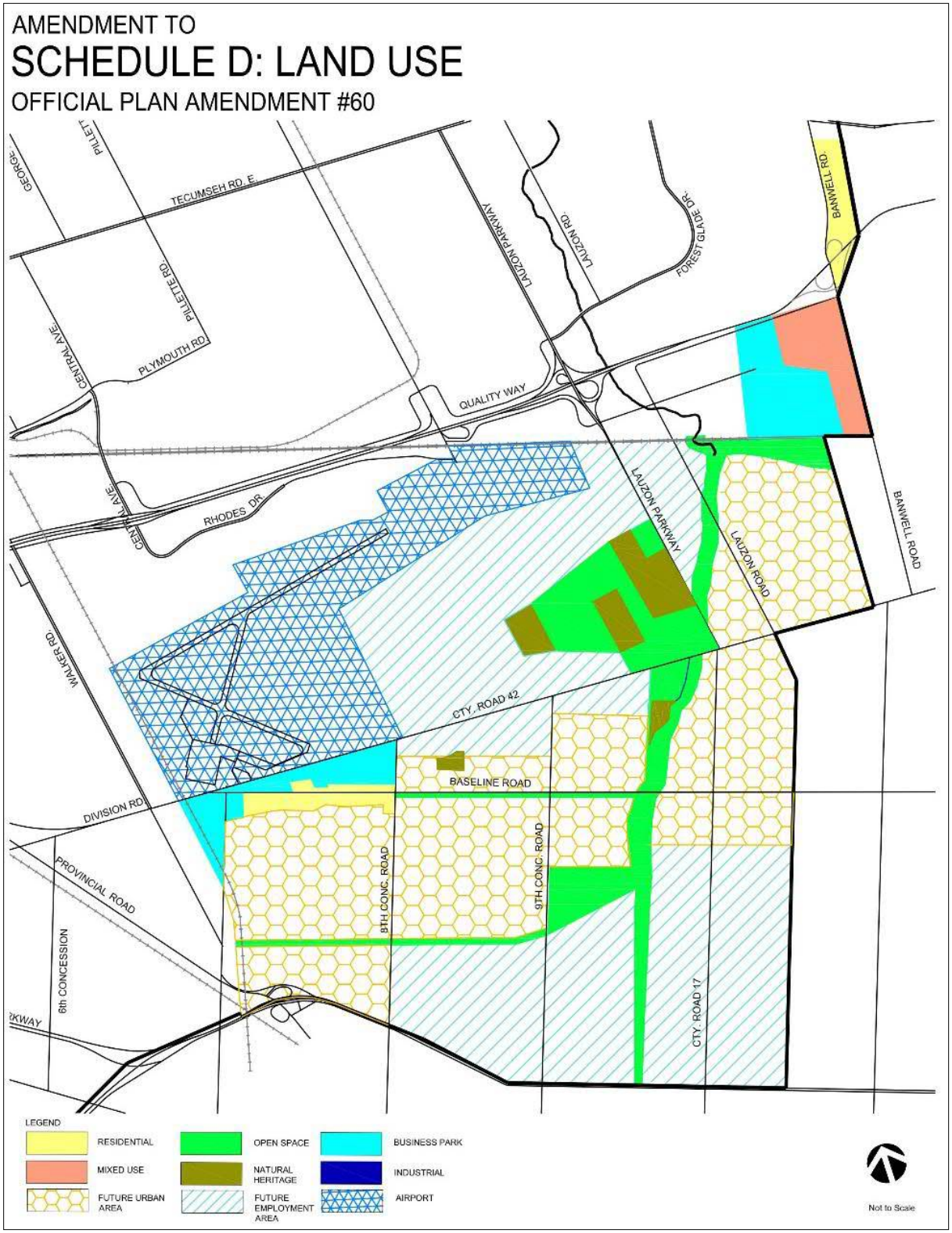


Image Source: (City of Windsor, Official Plan Amendment no. 60, 2007)

1.5.2 East Pelton Secondary Plan and OPA 74

The purpose of applying the 'Future Urban Area' and 'Future Employment Area' designations to portions of the Sandwich South Lands was to identify the need for a more detailed analysis facilitated through the secondary plan process. In 2009, the City approved the East Pelton Secondary Plan as Official Plan Amendment 74 ("OPA 74"), which was then approved by the OMB - Ontario Municipal Board (now Ontario Land Tribunal, OLT) (Board) in November 2010. The East Pelton Secondary Plan area covers approximately 206 hectares of the Sandwich South Lands, and is bounded by 7th Concession Road to the west, Baseline Road to the north, 8th Concession Road to the east, and Highway 401 to the south (see **Figure 1-3**).

The East Pelton Secondary Plan established Commercial Centre, Mixed Use, Private Recreation, Minor Institutional, and Major Institutional land use designations in the southern half of the secondary plan area. The northern half was designated as primarily 'Future Development'. The City subsequently adopted Official Plan 94 ("OPA 94") that designated the 'Future Development' areas for low and medium density residential uses. Following appeals to the Board, OPA 94 came into effect in 2016.

Figure 1-3: East Pelton Secondary Plan

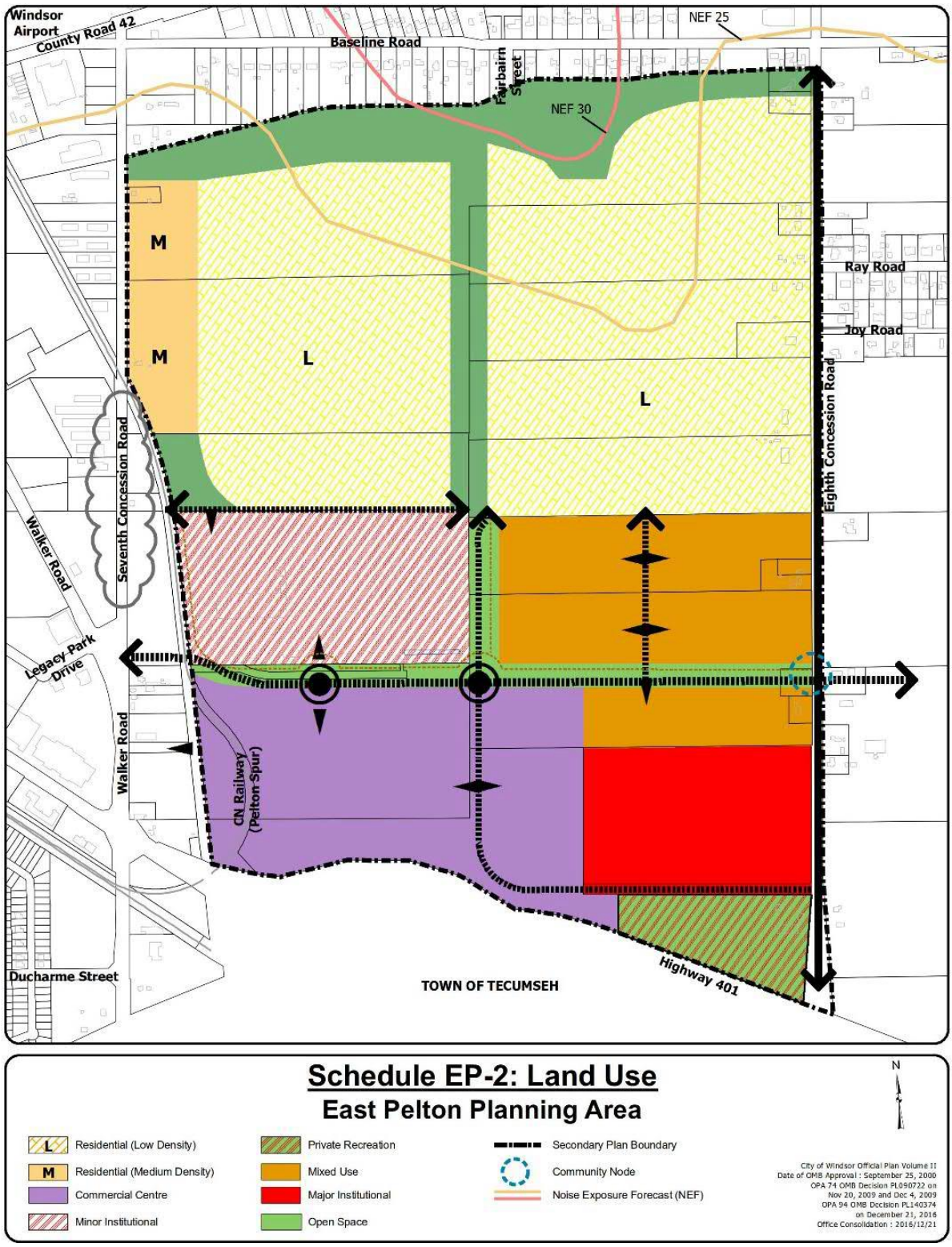


Image Source: (City of Windsor, Official Plan Volume II - East Pelton Planning Area, 2016)

1.5.3 Windsor International Airport Master Plan

In 2010, a Master Plan Study (APS Aviation Inc. and Dillon Consulting Limited) was undertaken by the Windsor International Airport (the "Airport") to provide a long-term development plan for the Airport and other lands adjacent to the Airport. The Airport Lands comprise of approximately 800 hectares of the Sandwich South Lands. In addition to a strategy for the expansion of airport facilities, a significant portion of the lands were recommended for employment uses. **Figure 1-4** shows the Airport Lands and proposed land use plans.

Figure 1-4: Airport Master Plan Land Use Schedule

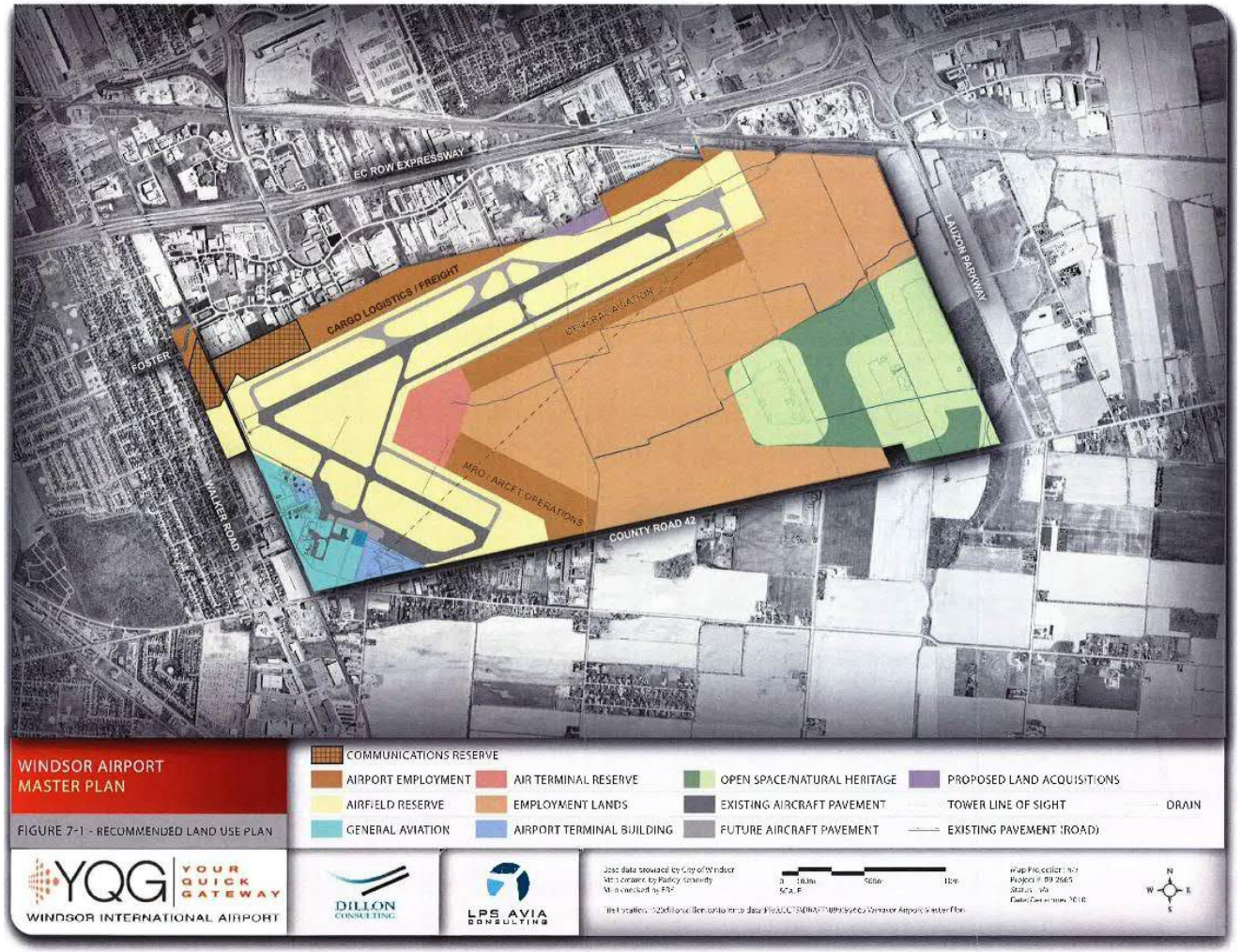


Image Source: (Windsor Airport Master Plan, 2010)

1.5.4 Sanitary Sewer Servicing Study for Lands Annexed from the Town of Tecumseh (2006) and Addendum (2014)) (SS Sanitary EA)

The City also completed several Municipal Class Environmental assessments for the Sandwich South Lands. In 2006, a Schedule B Municipal Class Environmental Assessment (EA) was completed to evaluate opportunities to provide trunk sanitary service to the annexed lands. The preferred alternative identified the expansion of the Little River Pollution Control Plant, along with the installation of a new trunk sanitary sewer. Construction of the trunk sanitary sewer was completed in 2011 using Infrastructure Stimulus Funding released by the federal government during the recession. In 2014 the drainage area serviced by the trunk sanitary sewer was increased to include lands located within the East Pelton Secondary Plan under an addendum to the 2006 Schedule B Environmental Assessment.

1.5.5 Upper Little River Watershed and Master Drainage and Stormwater Management Plan (2023)

A Class Environmental Assessment was initiated in order to determine a preferred approach to addressing flood risk and providing stormwater management measures needed for the development of lands upstream of the E.C. Row Expressway within the Little River Watershed. The City, Town of Tecumseh, and the Essex Region Conservation Authority (ERCA) retained Stantec to complete this Upper Little River Watershed Master Drainage and Stormwater Management Plan Environmental Assessment (ULR SWM). which was completed in November 2022 and posted for public review January 2023. City of Windsor Council recommended completion of the Notice of Study Completion on Nov. 28th, 2022 (Council Report: c181/2022 Item No. 7.3). The notice of completion is dated January 21, 2023.

1.5.6 Lauzon Parkway Improvements Class Environmental Assessment Study

A Schedule C Class Environmental Assessment was also completed in January of 2014 to address the future requirements for Lauzon Parkway, County Road 42, and a future East-West Arterial Road within the Sandwich South Lands. An addendum was issued for the Lauzon Parkway Improvements Environmental Study Report in May of 2015 which included revisions to the proposed East-West Arterial within the Study Area. This study established the need for widening of these corridor as well as provided the functional cross-sectional design and alignment of the future corridors.

Figure 1-5: Lauzon Parkway Improvements Class EA Study Area

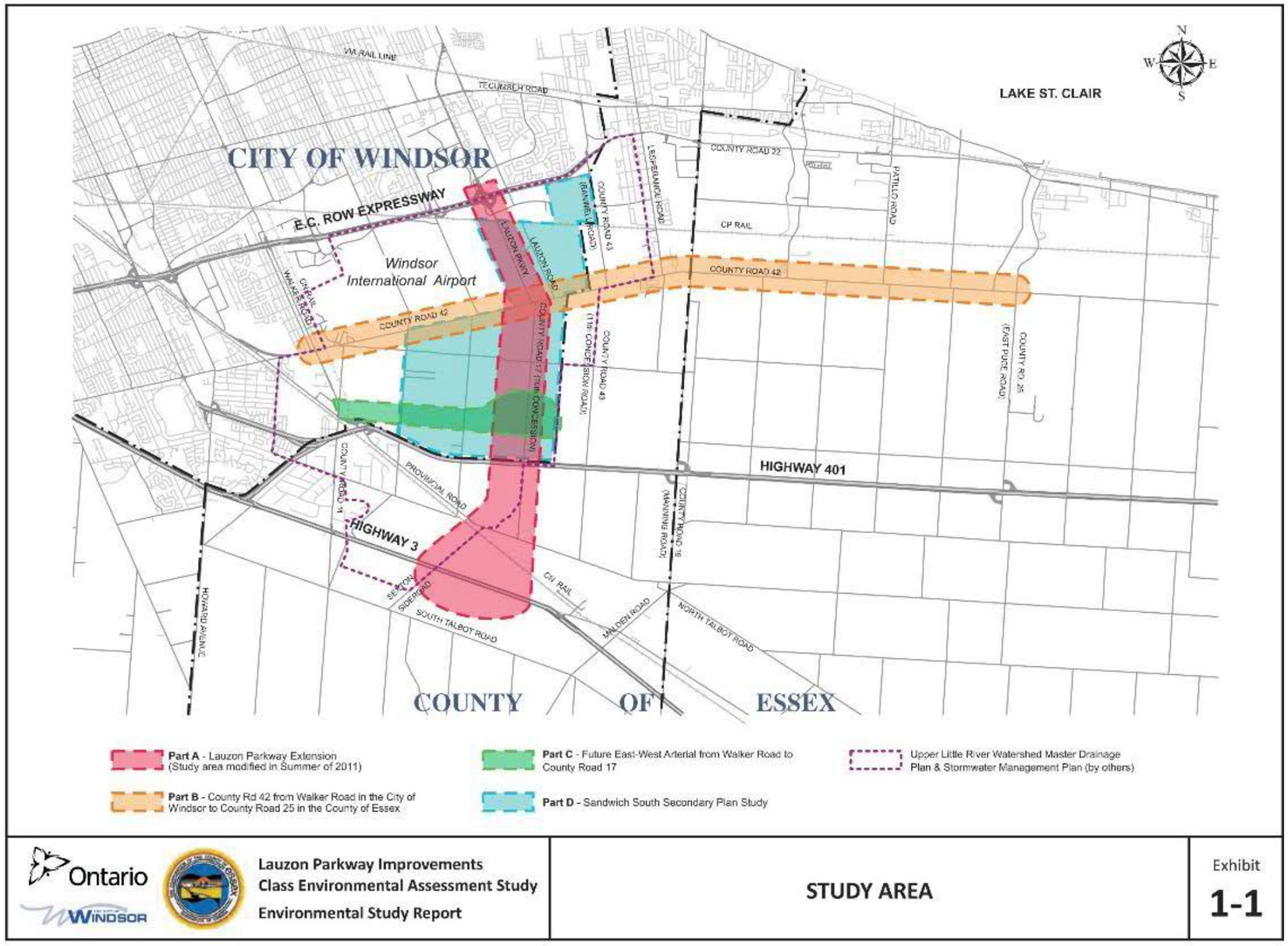


Image Sources: (City of Windsor, Lauzon Parkway Improvements Class Environmental Assessment Study, 2014)

1.5.7 Banwell Road Environmental Assessment

The proposed Banwell Road Schedule C Class Environmental Assessment was completed in January of 2014 to address the future improvements to Banwell Road between Tecumseh Road East to the City of Windsor Limits at the Canadian Pacific Railway (CPR). This study recommended the widening and realignment of Banwell Road along the entire Study Area limits. Widening includes a first stage for which 4 lanes will be provided along the entire segment of Banwell Road and added provision for future widening to 6 lanes between E.C Row and the CPR Tracks.

1.5.8 County Road 43 Environmental Assessment

This study provided recommendations for the improvements to County Road 43 between the City of Windsor boundary, immediately south of the CPR Tracks, to CR 42. The preferred design including the widening of CR43, realignment of CR42 to connect CR42 with 11th Concession Road and the implementation of two intersections to provide access to future development areas.

1.5.9 County Road 42 Secondary Plan and OPA 120

In 2018, the County Road 42 Secondary Plan (MHBC Planning) was initiated by Windsor Regional Hospital following the selection of the site for the future regional hospital. The selected site is located on the south side of County Road 42, east of 9th Concession Road and was designated 'Agricultural Transition Area' on the Official Plan Amendment, Schedule A: Planning Districts and Policy Areas, and 'Future Employment Area' and 'Future Urban Area' on Schedule D: Land Use. In accordance with the policies of the Official Plan, development on lands with these designations requires the completion of a Secondary Plan. The County Road 42 Secondary Plan was approved by Council as Official Plan Amendment 120 ("OPA 120"), and subsequently following appeals to the Ontario Planning Tribunal (OLT) OPA 120 the plan was approved.

The County Road 42 Secondary Plan (CR SPA) area is bounded generally by CR42 and the Windsor International Airport to the north; Joy Rd to the south; 8th Concession Road to the west; and 10th Concession Road to the east. See **Figure 1-6** below. The goals of the plan include establishing the development concept, objectives, and policies to guide future development of the CR42 SPA area including a full range and mix of housing and employment. OPA 120 also provides for the establishment of a road network within the

County Road 42 area and the development of a new Regional Hospital to service the City and Essex County.

Figure 1-6: County Road 42 Secondary Plan Land Use Plan

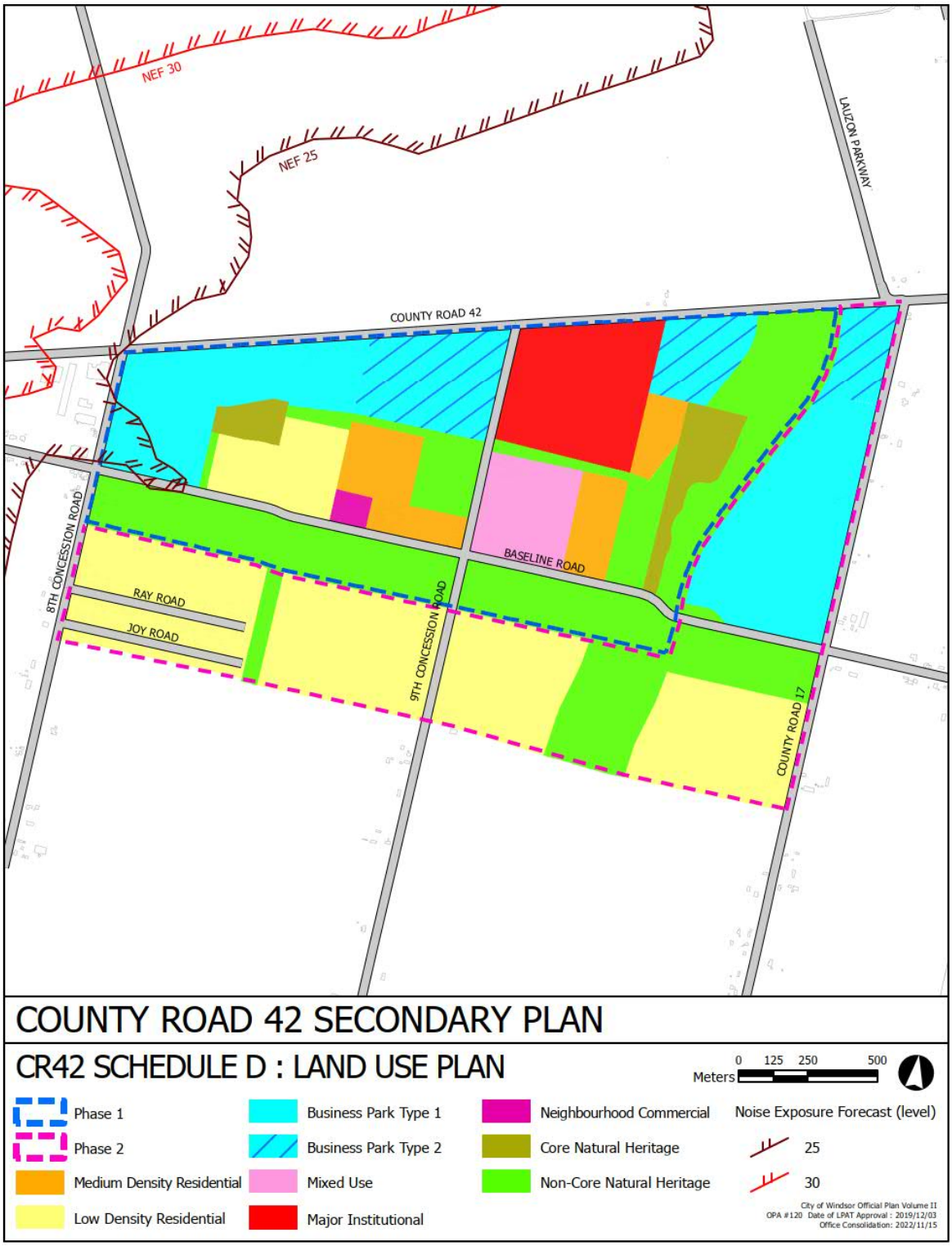


Image Source: (City of Windsor, Official Plan Volume II – CR42 Schedules, 2018)

1.6 Integration with Other Studies

In addition to this Master Servicing Plan, there are a number of related studies currently underway related to this Study Area. The technical team has worked closely with City administration and other consultants, to ensure that findings and recommendations developed through this study are consistent with other studies. **Figure 1-7** and **Table 1-1** below identify other studies recently completed or underway.

Figure 1-7: Integration with Other Studies

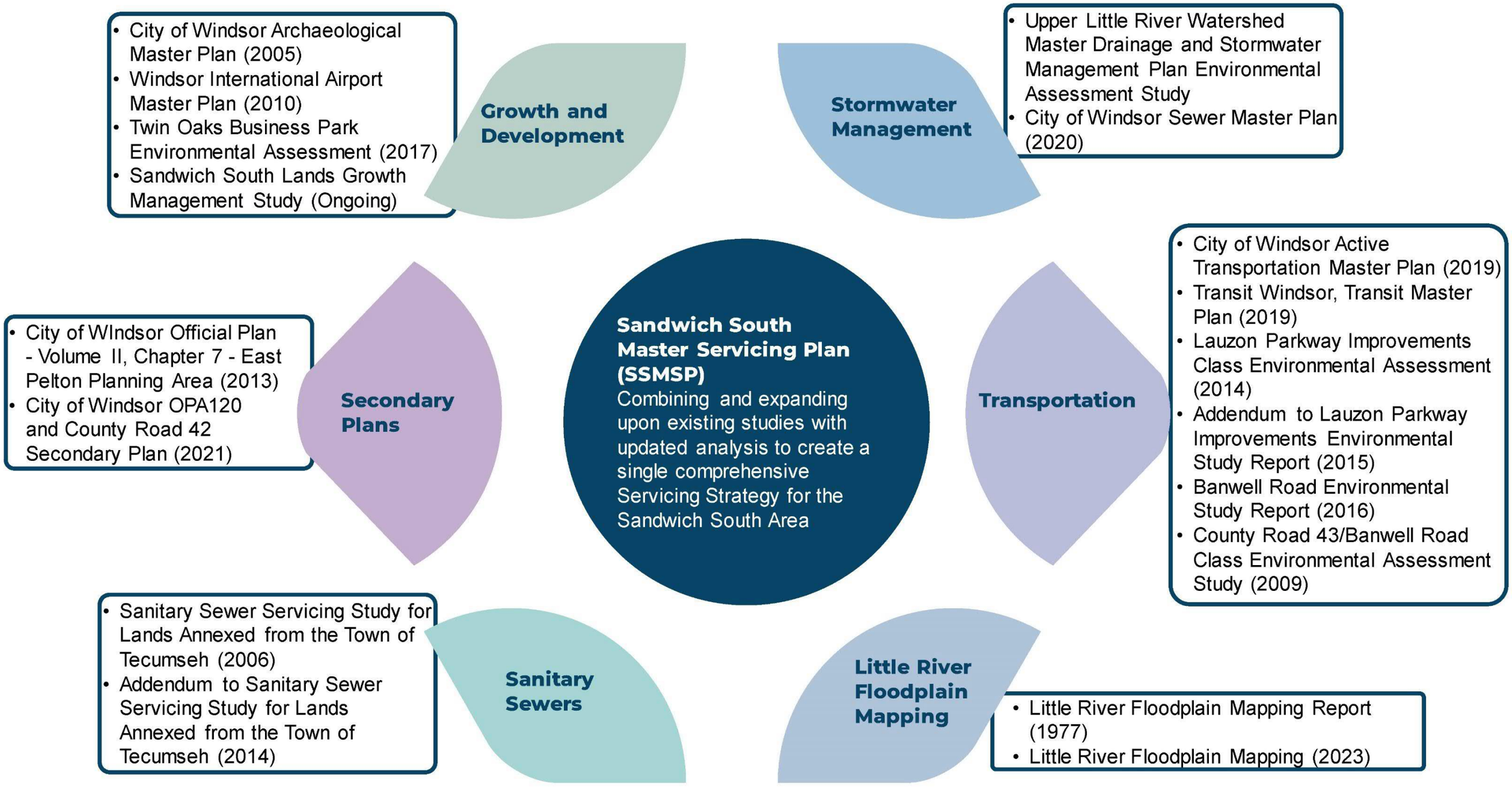


Table 1-1: Related Study Summary

Study Title	Consultant Author	Coordination with this Master Plan
Upper Little River Watershed Master Drainage and Stormwater Management Plan Environmental Assessment Study (2023)	Stantec Consulting Limited	This study was used as a basis for the drainage servicing strategy and functional design for stormwater management facilities within the future stormwater management corridors. Maximum allowable release rates and design criteria was established through this report.
City of Windsor Sewer and Coastal Flood Protection Master Plan (2020)	Dillon Consulting Limited and Aquafor Beech Limited	This plan was used in the functional design of the storm and sanitary network, setting servicing criteria for the sewer design.
"Walk Wheel Windsor" Active Transportation Master Plan (2019)	City of Windsor	This report guides investments in active transportation over the next 20 years in the City of Windsor. Recommendations have been considered in the development of the overall transportation network plan.
"More Than Transit" Transit Windsor Master Plan (2019)	Dillon Consulting Limited	Provides strategy to guide the Transit system's growth over the next decade. Recommendations to serve the CR42 SPA area have been integrated into the overall Transit ultimate servicing strategy.
Lauzon Parkway Improvements Class Environmental Assessment (2014) and Addendum (2015)	MRC, A Member of MMM Group	The recommended capacity and alignment of the arterial roads recommended through this study were used to establish the internal road network.
Banwell Road Environmental Study Report (2016)	IBI Group	Findings of this study were used to review the recommendations of the transportation network.
County Road 43/Banwell Road Class Environmental Assessment Study (2009)	Giffels Associated Limited/IBI Group	Findings of this study were used to review the recommendations of the transportation network.
Little River Regulatory Floodplain Mapping (LRRFM) (Ongoing)	Dillon Consulting Limited	The development stormwater management control criteria pertaining to the Little River has been established through this study. Flow control and placement of stormwater management corridors established in this study were used as a basis for the SSMSP SWM Analysis and Functional Design.
Sanitary Sewer Servicing Study for Lands Annexed from the Town of Tecumseh (2006) and Addendum (2014) (SS Sanitary EA)	Stantec Consulting Limited	The trunk sanitary sewer network recommended through this study was confirmed based on the refined land use plan and including functional conflicts checks with other proposed infrastructure.
City of Windsor Official Plan – Volume II, Chapter 7 – East Pelton Planning Area (2013)	City of Windsor	Description in **Section 1.5.3**, established land use, population density, road network and planning criteria for the East Pelton SPA.
City of Windsor OPA120 and County Road 42 Secondary Plan (2018)	MHBC	Description in **Section 1.5.9**, established land use, population density, road network and planning criteria for the CR42 SPA.

Study Title	Consultant Author	Coordination with this Master Plan
City of Windsor Archaeological Master Plan (2005)	Culture Resource Management Group Limited/Fisher Archaeological Consulting/Historic Horizon Inc.	Reference to this plan was used by CRM in the completion of the SSMSP Stage 1 Archaeological Assessment. Also, a number of previously completed Stage 1, 2 and 3 completed within this Study Area were used and refenced in the reports in Appendix C.
Windsor International Airport Master Plan (2010)	Dillon Consulting Limited/LPS Aviation Inc.	Extent of potential development lands were incorporated into the ultimate land use plan and road network. Information was used to evaluate the required waterfowl mitigation measures for the proposed SWM facilities.
Twin Oaks Business Park Environmental Assessment (2017)	MMM Group Limited	Findings of this report were integrated into the various municipal servicing analyses for the SSMSP Area.
Sandwich South Lands Growth Management Study (Ongoing)	Hemson	This study provided necessary population densities and growth projections for the various proposed land uses to be used in the sizing of proposed municipal infrastructure.
Energy Management Plan (2019)	The City of Windsor	The City's Energy Management Plan (2019) provides framework for how Sandwich South is planned to be a 'Net-Zero' Neighbourhood. Those targets are being considered in the development of the SSMSP, please refer to the Council Report S 116/2020 Dated September 1, 2020.

1.7 Ontario Bill 23

To meet the rapidly growing need to provide housing in the province of Ontario, Bill 23, More Homes Built Faster Act (2022) received rapid Royal Assent on November 28, 2022. This Bill prescribes amendments to existing regulatory acts pertaining to development to assist in expediting the construction of affordable homes. The act is part of the Provincial Government's plan to build 1.5 million new homes over the next 10 years in the province, with a construction target set for the City of Windsor and County of Essex to build 30,400 homes by 2031, 13,000 of those homes to be build in the City of Windsor.

The implementation of this Bill removes some of the due diligence provisions that various agencies, first nations and other 3rd parties require prior to the development of lands. The implementation of this Bill and its direct impacts to the development within the SSMSP are unclear at this time, however, the development of this document was mostly completed prior to the implementation of this Bill and requirements stipulated herein do not reflect changes prescribed in this Act.

2.0 The Environmental Assessment Process

2.1 Master Plans and the Class EA Process

Master Plans are long-range plans that take a system wide approach to identify interconnected issues and related infrastructure projects to address system needs. The Master Plan, using environmental assessment principles, examines the existing infrastructure system or group of community projects, in order to come up with a broad framework and long-term plan to make infrastructure improvements. Considering a full system and developing an overall plan is efficient, thorough, and provides tangible benefits to the community. The final Master Plan identifies a full list of projects to be undertaken over time.

At a minimum, Master Plans must address at least the first two phases of the Class EA process, namely: identification of the deficiencies or opportunities, and identification of alternative solutions to address them. In addition, the MCEA Master Plan process requires consultation at key points. Refer to the MCEA flow chart (**Figure 2-1**) below for a description of each phase of the MCEA process and the mandatory consultation points.

Master Servicing Plans are typically reviewed and updated approximately every five years to address changing needs, and to take advantage of new approaches and technologies.

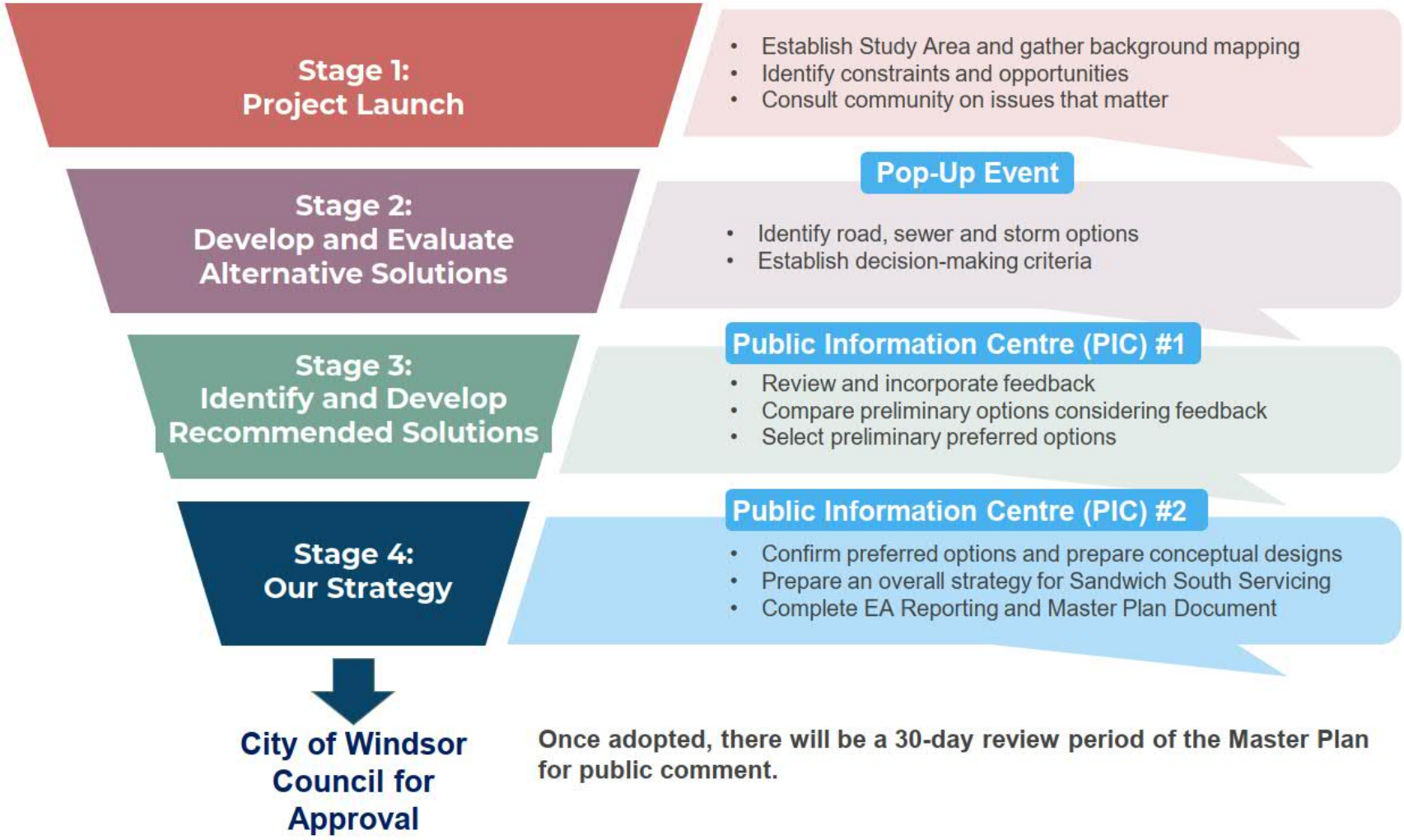
On March 3rd, 2023 the MCEA released an amendment to the Municipal Class EA process. Changes to this process include but are not limited to the following:

- Exemption of project types that are considered to be low impact, where there is duplication with other processes, or where the project types would be needed in cases of emergency;
- Upgrading or downgrading assessment requirements for projects (e.g. shifting project schedules);
- Revising cost thresholds for road projects; and
- Clarifying and modernizing current process requirements.

Also, additional clarification to Section 16 orders is included which allows requests to the MECP for an order imposing additional conditions or requiring an individual EA may be made on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights.

The following flow diagram (**Figure 2-1**) provides an overview of the SSMSP process and how the infrastructure servicing solutions have been developed though this study:

Figure 2-1: Flow Diagram - Master Plan Study Process



2.2 Approval of Projects Identified within the Master Servicing Plan

Under the MCEA process, projects are identified within different categories depending on their complexity and potential for effects on the surrounding environment. **Table 2-1** provides a summary of the different project categories. There are different approaches to completing Master Plans and for this Master Servicing Plan, the City has chosen to follow Approach #2 which means that the Master Plan will complete the full Class EA requirements for all projects identified as Schedule B projects. Schedule B projects include "improvements and minor expansions to existing facilities" that have the "potential for adverse environmental impacts," and require the proponent to consult with those potentially affected by the project's environmental impacts.

Following the posting of a Notice of Completion and approval by the MECP, projects identified as Schedule B will be approved for implementation and construction. Others (Schedule C projects) may require additional public notice and/or further study prior to implementation. The following table provides a summary of the different project categories:

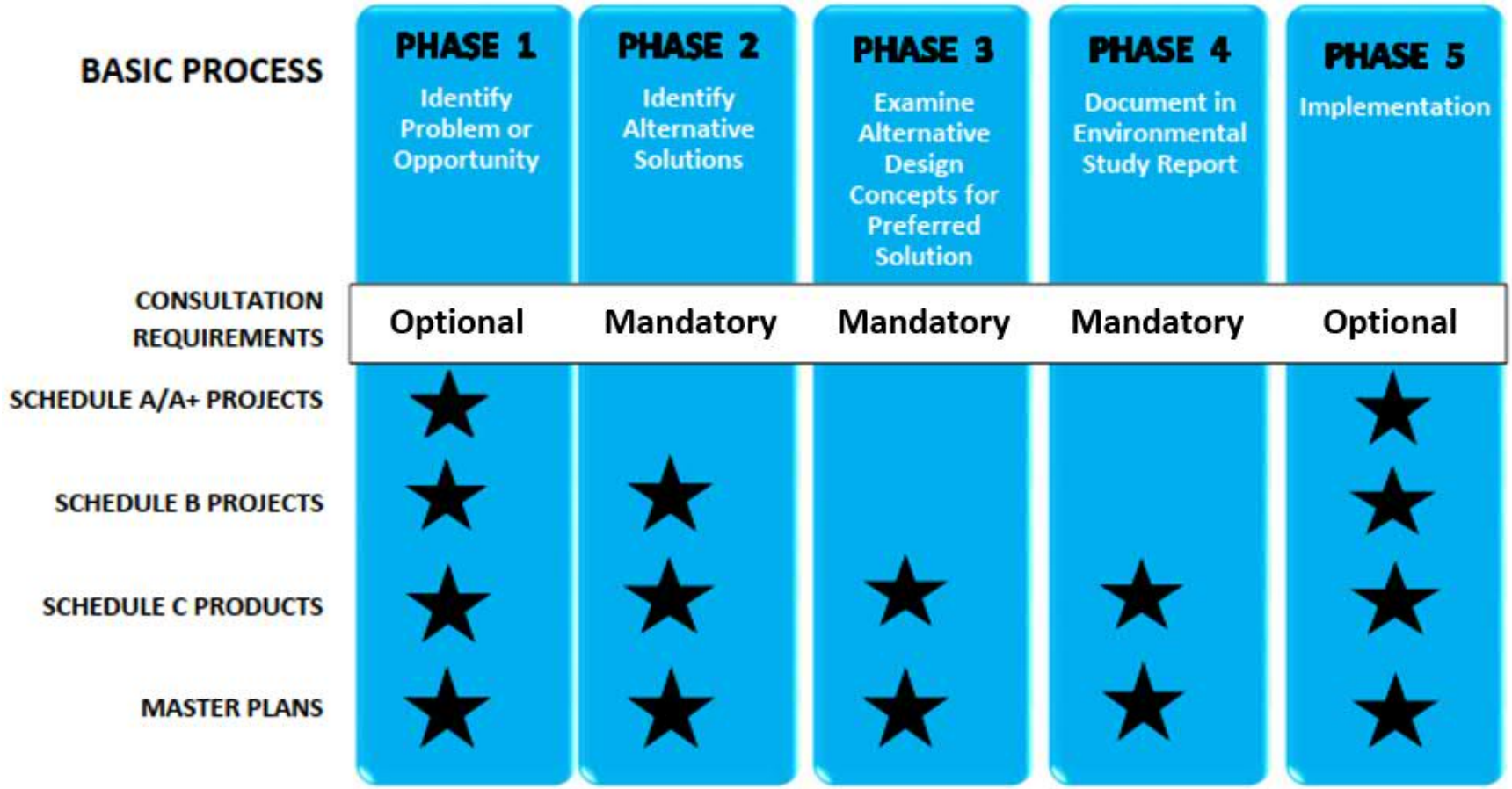
Table 2-1: Municipal Class EA Project Categories

Project Schedule (Category)	Description
Exempt Projects (Former Schedule A/ Schedule A+)	Projects are limited in scale, with minimal adverse environmental effects. These projects are pre-approved and may proceed to implementation. These include normal or emergency operation and maintenance activities. These projects are expected to have minimal adverse environmental effects, except they require public notification prior to implementation. Advising the community members is a means to inform those in the area where the work is to be undertaken. Notification is determined by the municipality, and can be one of these: a notice to adjacent neighbours, a notice posted at the site, a report to council, or a list of projects posted on the municipality's website, as examples.

Project Schedule (Category)	Description
Schedule B	Projects have the potential for some adverse environmental effects. The municipality is required to undertake Phases 1 and 2 of the MCEA and a complete screening process. This involves mandatory contact with those directly affected and relevant review agencies to ensure that they are aware of the project, and that their concerns are considered. These projects include improvements and minor expansions to existing infrastructure/facilities.
Schedule C	Projects have the potential for significant environmental effects. The municipality is required to conduct full planning and documentation procedures, including an Environmental Study Report that is reviewed by community members and review agencies. These projects include construction of new infrastructure/facilities and major expansions to existing infrastructure/facilities.

Figure 2-2 illustrates the Municipal Class EA planning and design process with the phases required for each schedule.

Figure 2-2 - Municipal Class EA Planning and Design Process



2.3 Problem Statement

Phase 1 of the Class EA involves developing a Problem/Opportunity Statement. The problem or opportunity statement defines the principal starting point in the undertaking of the Master Servicing Plan Class EA and assists in defining the scope of the project. The problem or opportunity statement for the Sandwich South Master Servicing Plan is defined as follows:

- To meet the future growth needs of the City of Windsor, almost 2,600 hectares of land in the former Township of Sandwich South were transferred from the Town of Tecumseh to the City of Windsor in 2002. The City has designated this area for future development over the next 20 years to include a variety of residential, commercial, industrial, and intuitional land uses. Existing municipal services are not sufficient to support this envisioned future development.
- The purpose of the Sandwich South Master Servicing Plan is to provide an environmentally sensitive and sustainable framework for the provision of comprehensive municipal services for both existing and future development within the area. Specifically, the Master Servicing Plan shall address the provision of transportation, wastewater and stormwater management for the land uses as defined in the City's Official Plan and related Secondary Plans.
- The Master Servicing Plan shall consolidate recommendations from previous studies, identify the required infrastructure required to serve the proposed development and to develop a plan for the implementation of the first phases of improvements.

To expand on the problem statement identified above, this study is focusing on providing the framework for the municipal servicing infrastructure required to support development as well as mitigate impacts to the existing municipal system.

Municipal servicing is separated into five distinct categories:

- Sanitary Sewer Servicing;
- Water Servicing;
- Storm Sewer Servicing;
- Stormwater Management; and
- Transportation.

Table 2-2 describes the unique problems and opportunities for each category.

Table 2-2: Problem Opportunity

Problem	Opportunity
Sanitary Sewer Servicing	
Provide framework for sanitary sewer servicing to provide guidance for organized development.	• Refine proposed trunk sanitary sewer sizing and location based on the recommended transportation network and updated land use plan and associated population projections; and • Incorporate the sanitary trunk sewer works in the overall staging and implementation strategy to plan the capital works projects and developer driven infrastructure.
Storm Sewer Servicing	
Provide framework for storm sewer servicing to provide guidance for organized development.	• Design a shared storm sewer network to convey stormwater runoff to the stormwater management facilities and to confirm storm sewer servicing meets the established level of service; and • Incorporate the storm trunk sewer works in the overall staging and implementation strategy to plan the capital works projects and developer driven infrastructure.
Stormwater Management	
Stormwater management facilities are required to provide quantity and quality control.	• Confirm that proposed development will not have negative impacts to downstream areas; • Provide a comprehensive stormwater management servicing strategy to provide quantity and quality control for development; • Define the lands required to accommodate the consolidated stormwater management corridors; and, • Develop a plan for improvements of municipal drains that will act as the stormwater outlet.

Problem	Opportunity
Transportation	
The transportation network shall be implemented to accommodate growth. Vehicular, active transportation and public transit infrastructure is needed to support demand.	• Consider solutions that will group facilities, saving money in capital and operational costs; • Establish a long-term plan to improve the existing road network; • Identify a shared road network layout to support growth; • Opportunity to preserve space now for future road networks; and • Opportunity to preserve space for sidewalks, cycling facilities and future transit service.

3.0 Stakeholder Engagement

The following section summarizes the key components of the public consultation and communication strategy implemented throughout the study. It also provides the background support for satisfying public consultation requirements under the MCEA Class Environmental Assessment Process. **Appendix A** contains a compilation of all the relevant documentation related to the public, stakeholder, and agency consultation.

3.1 Communication and Engagement Overview

The overall objective of communicating and engaging with specific stakeholders and the broader public is to create a Master Plan that considers input from local agencies, the community, land owners, local indigenous communities, stakeholders, and is supported by City of Windsor Council. The consultation program is designed to:

- **Increase awareness.** Effective communication to increase the public's awareness of the City's long term plans to guide growth in Sandwich South;
- **Obtain input on Master Plan development.** Consultation activities designed to inform as well as to provide opportunities for stakeholders and members of the public to provide input;
- **Be transparent and timely.** A fundamental objective is to provide clear information on how the public can be involved, the stages in which they will be consulted and how their input fits with the technical steps of the project.

Table 3-1 summarizes the overall consultation program tactics and timing in relation to the key technical work steps noting that website updates were maintained throughout the project.

Table 3-1: Summary of Consultation Program

Technical Stages and Timing	Communication and Consultation Tactics
Stage 1 – Project Launch (Summer 2019 – Winter 2020)	• Notice of Commencement • Pop-Up Event
Stage 2 – Develop and Evaluate Alternative Solutions (Winter 2020 – Spring 2020)	• Stakeholder Advisory Committee created (SAC) • SAC meeting #1

Technical Stages and Timing	Communication and Consultation Tactics
	• Public Information Centre (PIC) 1 Notice • Public Information Centre (PIC) 1
Stage 3 – Identify and Develop Recommended Solutions (Summer 2020 – Summer 2022)	• SAC meeting #2 • Public Information Centre (PIC) 2 Notice • Public Information Centre (PIC) 2 and Online Survey; • Individual Property Owner Meetings
Stage 4 – Our Strategy (Fall 2021 – Winter 2023)	• Online Additional Stormwater Management Assessment Public Consultation Session (June 2022) and Survey; • Individual Property Owner Meetings; and • Notice of Completion (Upon Report Completion).

Consultation documentation, communication materials and input received can be found in **Appendix A.**

3.2 Stakeholder Contact List

It is important to ensure that those who might be interested or affected by the SSMSP are provided the opportunity to participate in its development. As such, a comprehensive project contact list was developed including stakeholders from the community. In a dedicated effort to keep everyone informed, contacts from various City divisions and agencies were also included. It is noted that the project contact list was discussed with representatives of the City of Windsor to ensure that the list reflected their knowledge of community members and interested groups. Throughout the project, people were able to sign up to join the contact list online, at events, on the website and through email. The following lists the categories of stakeholders that are included on the contact list. These stakeholders were consulted throughout the project:

- Stakeholder Advisory Committee (SAC);
- City of Windsor elected officials;
- Provincial and federal elected officials;
- City of Windsor municipal staff;

- Neighbouring Municipalities and the County of Essex;
- Affected property owners (i.e. property owners within Sandwich South Study Area as well as those within approximately 120 m of the Study Area boundary (addresses provided by the municipality);
- Provincial and federal regulatory agencies;
- The Windsor International Airport;
- Indigenous Communities; and,
- Other local stakeholders (e.g., environmental organizations, local conservation authority, businesses and business organizations, utilities, school boards, Transport Canada).

3.3 Notice of Study Commencement

A combined Notice of Study Commencement and Pop-Up Event was distributed to the stakeholder list on January 17, 2020. It was also posted on the Sandwich South Master Servicing Plan website (www.sandwichsouth.ca) and in the Windsor Star newspaper. The combined Notice of Study Commencement and Pop-up Event is provided in **Appendix A.**

3.4 COVID-19 Protocol Implementation

The project team implemented COVID-19 protocols beginning in March 2020. This protocol enhanced online engagement with study stakeholders to receive appropriate input. With the exception of the Pop-Up Event, the PICs and most of the additional public consultation activities were held virtually.

3.5 Public Consultation Activities

In addition to viewing information on the project website, the public had a number of opportunities to get informed and involved at public information centres (PICs). The Pop-up Event and PICs included displays of technical information which provided opportunity for those attending local events in-person or virtually to learn about the Master Servicing Plan project. The events are summarized in **Table 3-2**.

Table 3-2: Summary of Public Consultation

Event Location and Date	Focus of Discussion	Attendees
Pop-Up Event Forest Glade Arena January 30, 2020 4:00pm – 7:00pm	Opportunity for residents to provide input on the Study Area including an ArcGIS mapping exercise to identify opportunities/constraints	5 Dillon staff 5 City staff ~ 70 others
PIC #1 Online Event September 24, 2020 – October 31, 2020	Video presentation was presented as five stations: Station 1 - Context Station 2 – Existing Conditions Station 3 – Transportation Station 4 – Sanitary and Storm Sewers Station 5 - Updated Floodplain Mapping and Stormwater Management Provided multiple ways for the public to provide their feedback and comments. This included contacting a member of the Project team, emailing the project email at sandwichsouth@dillon.ca, or completing the online survey.	Virtual information available through the City of Windsor project website.
PIC#2 Online Event September 8, 2021 5:00pm – 7:00pm	Virtual presentation providing participants with additional information about the Little River Flood Plain Mapping, Sanitary Servicing & Stormwater Management and Transportation strategy, including the options considered and the preferred option. There was also a Question and Answer period.	6 Dillon staff 5 City staff 26 Others
Public Consultation Online Event June 6 to July 4, 2022	Video presentation providing an update on the progress of the project, details on the expansion of the stormwater assessment Study Area,the recommended solution, and a summary of next steps.	Virtual information available through the City of Windsor project website.

Throughout the public consultation process and at each of these events, comments were received from public and agency stakeholders. These comments were filed and

addressed accordingly. **Appendix A** provides the detailed list of comments and responses throughout the study including the PICs, online survey, and individual meetings with stakeholders and agencies.

After each session, a summary of questions and comments received and responses provided were posted on to the City's Website. Documents listed below can be found in **Appendix A-2**.

- Public Information Centre (PIC) #1, September 24, 2020 - October 31, 2020; and
- Public Information Centre (PIC) #2, September 8, 2021.

Summary of the comments and responses pertaining to the Supplementary Consultation Session entitled Additional Stormwater Management Assessment (June 2022) can be found in **Appendix A-2**.

3.6 Property Owner Consultation

Additional correspondence was facilitated with stakeholders who owned property within the locations of recommended solutions. Through a number of virtual and in-person stakeholder meetings, the project team completed a review of the alternatives and preferred solutions. Over 25 meetings were held with individual property owners between September 2021 and July 2022.

Consideration was given to the concerns expressed regarding the servicing strategy and the allocation of lands for the SWM locations. These concerns have been incorporated into the Evaluation Matrix, and ultimately the final strategy.

Minutes of each property owner meeting was recorded and provided to the property Owners. Those minutes are not included in this public document however are in the City's document file for reference**.**

3.7 Indigenous Communities Consultation

Consultation with Indigenous Communities is an important part of conducting an EA. Engagement with First Nations and Métis provides an avenue to understand their perspectives regarding the Project. **Appendix A** includes a summary of their communications. A copy of the Notice of Study Commencement and the PIC notices were sent on January 17, 2020, October 1, 2020, August 27, 2021, and May 27, 2022.

The Indigenous Communities and associations that were contacted as part of the South Sandwich South Master Servicing Plan include:

- Aamjiwnaang First Nation;
- Bkejwanong Territory (Walpole Island First Nation);
- Caldwell First Nation;
- Chippewas of Kettle and Stone Point First Nation;
- Chippewas of the Thames First Nation (COTTFN);
- Métis Nation of Ontario;
- Oneida Nation of the Thames (ONYOTA'A:KA);
- Tribal Council; and
- Windsor Essex Kent Métis Council.

In addition to mailing the Notice of Commencement and PIC Notices, Indigenous communities on the contact list were contacted by telephone on October 1, 2020, August 2, 2021 and January 10, 2023 to discuss the project in more detail. The Caldwell First Nations were additionally contacted on September 14, 2021. The intent of the telephone calls was to ensure that consultation materials had been received and to provide further information on the project. No comments regarding the project were received as a result of the telephone calls.

The following summarizes the points of contact with the Indigenous Communities:

- January 17, 2020 – Notice of Study Commencement letters were sent to each of the indigenous communities.
- October 1, 2020 – Notice of Public Information Centre 1 were sent to each of the indigenous communities including follow up phone calls to confirm receipt and provide clarity on the project.
- The project team has received confirmation of receipt of materials from the Chippewas of the Thames First Nation (COTTFN) on November 12, 2020. It was identified that there were minimum concerns at that time.
- August 2, 2021 – Phone calls with first nations providing information on upcoming Public Information Centre 2 and allowing them to discuss the project in more detail.

- August 27, 2021 – Notice of Public Information Centre 2 was sent to each of the indigenous communities.
- September 14, 2021 – Contacted Caldwell First Nations and submitted the project to their online consultation tool.
- May 27, 2022 – Public Consultation Session notifications were sent to each of the indigenous communities.
- January 10, 2023 – A project update letter was distributed to each of the indigenous communities and related agencies to provide a project update and summary of findings of this study. This included adding this letter to the Caldwell First Nations online consultation application.

The First Nations shall be contacted in conjunction with the completion of Stage 2 archaeological assessments and subsequent Stage 3 and 4 assessments, if required.

3.8 Agency and Municipal Consultation

Liaison and information exchange occurred with key agencies and neighbouring municipalities as follows:

3.8.1 Ministry of the Environment, Conservation, and Parks (MECP)

Consultation meetings were held with MECP on November 13, 2019 and July 21, 2021, minutes of meetings are included in **Appendix A.** The purpose of these meetings was to provide an overview of the objective, solution development and evaluation methodology in order to ensure it was in keeping with the prescribed Master Plan Process.

3.8.2 Essex Region Conservation Authority (ERCA)

The project team has had direct and consistent coordination with ERCA throughout the duration of this project. The SSMSP study was completed in parallel with the completion of the LRRFM study.

Throughout the duration of this project, ERCA has been actively involved in the establishment of design criteria and development of alternatives for the implementation of stormwater management and storm sewer conveyance infrastructure. ERCA has been integral in the technical development of this project including but not limited to the following:

- Attendance at many of the project team technical solution review workshops;
- Involved in the development of public consultation materials and attendance to PICs; and
- Attendance at select property owner meetings and consultation meetings with the Windsor International Airport (Airport) staff.

Little River Regulatory Floodplain Mapping (LRRFM)

As noted above, the LRRFM study was initiated by ERCA concurrently to the SSMSP study. ERCA has led the completion of that study, which has resulted in the completion of technical reports and floodplain mapping that will act as the baseline flood protection elevations for all future development within the SSMSP Area.

Section 5.7 provides additional clarification on how the LRRFM works were integrated into the solution development and functional design of municipal services.

Drainage and Stormwater Management

The project team met with ERCA on May 24, 2022 and also provided additional project update on December 9, 2022 and February 27, 2023 on the development of the stormwater management and storm sewer conveyance solutions developed.

Source Water Protection

The project team presented the project to ERCA's Source Water Protection Project Manager and provided an overview of the solutions developed and the potential impacts and changes to the downstream receiving water courses on November 10, 2021. ERCA has responded with a formal letter outlining concerns related to the Source Water Projection dated July 19, 2022. Mitigation measures to address source water project have been detailed in **Section 6.1.3** below.

3.8.3 Town of Tecumseh

The project team met with the Town of Tecumseh, on June 3, 2021 to review the findings of the infrastructure solution assessment and determination of preferred solutions. The following summarizes the key discussion points of this meeting.

- Overview of the transportation network analysis findings was provided which recommends refinements to the proposed internal Sandwich South road network and widenings required to accommodate development anticipated under ultimate conditions. It was noted that this study is not looking at assessing conditions of the greater arterial road network outside of the Sandwich South Study Area and a Transportation Master Plan involving the County of Essex, City of Windsor, and Town of Tecumseh could be undertaken to review the greater network conditions.
- The Town was interested in understanding the timing of required County Road 22 and Banwell Road intersection. The City noted the timing of the intersection is currently unknown and the City will provide an update to the Town when available.
- The project reviewed critical road connections along Banwell Road and County Road 43 from the Town of Tecumseh.
- The Town of Tecumseh has been involved in the development of the LRRFM study. It was noted that, based on draft floodplain findings, impacts to development within the Town are not anticipated. It is expected that no additional outlet analysis will be needed for future development.
- The Town is currently in discussions with Windsor Utilities Commission (WUC) regarding the impacts to Town water and the implementation of the water tower outlined within the WUC Water System Master Plan 2019 Update.

3.8.4 County of Essex

The project team met with the County of Essex on October 18, 2021. The following summarizes the key outcomes of this meeting.

- Dillon provided an overview of the project including the findings of the Little River Watershed Regulatory Mapping project, the findings of the stormwater management municipal servicing and transportation network evaluation of alternatives and preliminary preferred recommendations;
- The County provided the anticipated construction schedule for County Road 42 and 43 corridor improvements; and
- It was confirmed that findings of the previously completed Lauzon Parkway EA (2014) and CR43/Banwell EA (2009) were used as a basis for the transportation assessment that has been completed to develop the internal collector road network within the Sandwich South Area.

3.8.5 Windsor International Airport

Coordination with the Airport was imperative in the development of municipal servicing solutions specifically as it relates the proposed stormwater management ponds.

The project team met with relevant Airport representatives throughout the master plan process on June 17, 2020, May 19, 2021, March 22, 2022, and October 11, 2022. Below summarize key outcomes of consultation with AIRPORT staff.

- Implementation of both, wet and dry ponds are recommended for site servicing of the Sandwich South area based on the previously undertaken ULR SWM Study (Draft 2017). The SSMSP study has evaluated the stormwater management solutions.
- Stormwater management ponds can attract waterfowl which poses safety risks associated with aircraft collisions. The functional design of the stormwater ponds shall incorporate provisions to mitigate waterfowl habitat and necessary monitoring and maintenance must be completed to ensure that provisions are effective over the long term.
- It was requested that an Adaptive Management Plan be completed to outline the stormwater management pond design elements that will be recommended to mitigate waterfowl habitat, including what regular maintenance would be required.

The Supplementary Waterfowl Adaptive Mitigation Plan (WAMP) for Stormwater Management Facilities (report has been appended in **Appendix H**.

- It was discussed that resources to implement these systems would need to be made available and that the roles and responsibilities of that type of program shall be prescribed. The Airport would have to expand their wildlife control programs to mitigate the impacts resulting from additional SWM facilities. The WAMP recommends a monitoring program be developed between the City of Windsor and the Airport.
- In October 2022, the Airport provided further recommendations regarding the use of wet ponds in the vicinity of the Airport plans. The Airport is requesting that the SSMPS servicing strategy adhere to the Transport Canada (TC) guidelines and that their preference would be to have dry ponds within the Primary Hazard Zone Areas as defined by TC. As a result, the final recommendations of the SWM functional design strategy was modified to consider these recommendations. Further description of these changes can be referenced in **Section 5.7.1** below.

Minutes of meetings held with the Airport are included in **Appendix A-6**.

3.8.6 Transport Canada

In addition to coordinating with the Airport, the project team reviewed the proposed stormwater management strategy and WAMP. On January 26, 2023, the project team met with Transport Canada to consult on the approach to mitigate waterfowl. Minutes of this meeting as well as consultation documentation have been included in **Appendix A-6**.

Transport Canada was in support of the strategy to approach stormwater management based on a hybrid approach (Refer to **Section 5.3.7**) for which ponds which are located directly within the Primary Hazard Zones shall be dry ponds and that all ponds shall be designed to meet the minimum design requirements specified in the WAMP. It was identified that the ponds will need to be included in the existing Airport's Wildlife Management Plan. Monitoring and maintenance will be required throughout the life of the proposed SWM facilities.

3.8.7 Utilities and Telecommunication Agencies

The project team met with the utility companies that currently serve the Study Area throughout the duration of this project. The project team met with Bell Canada, Cogeco Connexion, MNSi, Enbridge and Hydro One to review the proposed growth and development uses of this area. The utilities were provided the estimated total population growth to assist with planning and staging of infrastructure expansion.

The following meetings were held:

- Bell, MNSi and Enwin Water - November 14, 2019;
- Cogeco - November 21, 2019;
- Enbridge - December 9, 2019;
- Hydro One - March 4, 2021; and
- Bell, Cogeco, Hydro One, Enbridge, MNSi and Enwin Water - February 2, 2022.

In addition to the municipal servicing infrastructure, development will require power, natural gas, and telecommunication services. Currently, services are located along existing municipal right of ways for distribution of utilities as well as servicing existing development in the area.

3.9 Stakeholder Advisory Committee

Two meetings were held with a Stakeholder Advisory Committee (SAC) formed to provide regular input and guidance to the project team during the duration of the project. The SAC was made up of 33 members representing community interests, environmental interests, academic interests, and citizens at large. The SAC group met on July 27, 2020 and June 9, 2021 and meeting minutes are included in **Appendix A.**

Event Date	Focus of Discussion
SAC Meeting #1 July 27, 2020	• Introduce the project to the SAC members; • Provide an overview of the roles and responsibilities of the SAC members; • Provide an update on the work completed to date and respond to questions related to technical work; • Review what we heard from Stage 1 of engagement, including the Issues that Matter and solicit input on the issues;

Event Date	Focus of Discussion
	• Discuss upcoming engagement including PIC #1 and solicit the SAC's feedback on the proposed approach; and • Discuss next steps of the project.
SAC Meeting #2 June 9, 2021	• Provide a project update; • Highlight the objectives and criteria for the evaluation; • Provide a summary of the completed transportation analysis and the current options; • Provide summary of Stormwater Management analysis and the current options; • Provide an explanation of the floodplain mapping changes and the two zone concept; • Discuss the upcoming PIC #2; and • Discuss next steps of the project.

3.10 What We Heard

The engagement process involved a community pop-up event, Public Information Centres, online surveys and opportunities for the public to submit comments through in person meetings, email and the project's website. Based on these activities, the public identified their main concerns and the top issues that matter, with respect to the SSMSP.

Through the various points of engagement and the numerous one-on-one meetings with property owners, agencies and others, we have heard a number of concerns and have been requested to provide clarity on a number of study elements.

The SSMSP engagement program has tried to understand the needs of developers to support future development in contrast with the immediate impacts and servicing concerns related to the existing environmental landscape, agricultural use of these lands and presence of homes and businesses.

While the impacts vary by property and may not be realized for some time it is imperative that proposed infrastructure considers mitigation impacts and provides a plan that is easy to implement.

The **Table 3-3** below summarizes some of the recurring themes heard from participants that have engaged with the project team throughout the duration of this project.

Table 3-3: Summary of Consultation Comments and Response

Comments	SSMSP Response
Natural Environmental Impacts and Habitat Protection	
• What measure will be implemented to protect existing habitat areas? • Existing woodlots shall be maintained.	• Considerations for appropriate vegetation shall be integrated into the SWM corridors. A connected natural environment corridor will be integrated into the design. Refer to **Section 6.1.1.** • SAR have been identified and detailed habitat mitigation measures are outlined herein.
Urbanization and Multi-Modal Transportation	
• City should integrate policies and practices for responsible urban development that supports Windsor's environmental, net zero & stormwater goals. • Priority for active transportation routes so that the new community is not reliant on vehicular modes of transportation. • Appropriate transit connections and system expansions should be implemented to support new development and access to the new Hospital.	• Transit Windsor has been consulted and provided input on the proposed transit route mapping. • Proposed roads will be equipped with cycling and pedestrian facilities to meet Accessibility Requirements. Active transportation routes will also be accommodated with the proposed stormwater management corridors. • Transit routes consider additional needs to access the proposed Hospital site. Details are included in the Transportation Study in Appendix E.
Property Acquisition Impacts	
• Land acquisition requirements are significant and, in some instances, will require the acquisition of significant portions of existing land parcels. • Concerns related to the value of lands required for SWM. • Design shall minimalize the lands required for the SWM Corridors.	• Lands required for SWM corridors are outlined in **Section 6.1.1**. • Acquisition of lands to be compensated based on market conditions at the time of acquisition. Property value will be based on 3rd party assessments. • Wherever possible, land acquisition should avoid leaving remnant, unusable parcels

Comments	SSMSP Response
Flooding	
• How is flood risk being addressed? Will development increase flood risk to existing areas?	• Regulatory floodplain mapping has been updated to reflect current conditions and based on more accurate computational modelling. ERCA shall adapt the new regulatory mapping which will provide guidance on minimum flood protection grades and areas where development will be prohibited. • New developments must drain both minor and major runoff to their assigned SWM ponds. • Runoff will be released to downstream drains at a controlled rate, based flood mitigation parameters of the downstream system.
Cost Sharing	
• How will the cost for shared municipal service be paid for? Who will initiate the construction of trunk facilities? • Will there be impacts for taxpayers?	• The findings of this SSMPS will be used to develop Development Charges that will be used to fund the construction of regionally shared infrastructure.
Integration of Other Studies	
• Many studies are being completed or have been completed pertaining to infrastructure within this Study Area.	• Recommendations and findings of previous studies were used to develop the comprehensive servicing plan. Refer to **Section 1.6.**

Comments	SSMSP Response
Green Infrastructure and Climate Change	
• Green Infrastructure should be integrated into the servicing plan.	• Green infrastructure cannot achieve the required level of quantity control, due to local underlined soil conditions. • The team looked at the benefit of utilizing Low Impact Development (LID) measures to provide the necessary quality and quantity control and per the comparative evaluation and consultation with ERCA, the use of those measures solely to provide quality and quantity control is not supported. • The stormwater strategy includes maintaining the existing municipal drains within this study area. All stormwater management facilities will discharge to those drains to convey runoff to downstream watercourses.
Sanitary Sewer Construction and Connection Costs	
• How will property owners be assessed costs for Sanitary Sewers infrastructure?	• Area specific DCs will identify a per unit cost that will be applied to local developers. When sanitary sewers become available to existing residents those residents will be accessed a cost to connect to the new sewers. • Refer to City of Windsor By-law 9-2019, Section 1.21, which describes the property owner's responsibilities pertaining to connection to new sanitary sewers

Comments	SSMSP Response
Airport Safety	
• How are stormwater management solutions being designed to mitigation safety risks pertaining to the proximity to the Airport.	• The project team has consulted with the Airport and Transport Canada to develop a plan that will mitigate risks. • Design, implementation and operational requirements will be mandated as SWM facilities come online. • Hybrid approach to SWM ponds
Timing	
• When will this infrastructure be built? When is development expected?	• Timing of proposed infrastructure will be dependent on the needs for local developers. • Infrastructure needs to support immediate development has been identified and the City has allocated Capital costs for implementation of that infrastructure.

3.11 Notice of Study Completion

The Notice of Study Completion will be distributed via mail and email to identified stakeholders and advertised on the project website and in the Windsor Star. The Notice of Completion will be presented to City of Windsor Council during a regular Council meeting.

4.0 Existing Conditions

4.1 Natural Environment

The balance between human activities and natural features and how they both function, is the key to a healthy and sustainable community. In order to achieve this balance, a community must manage its development activities while also attempting to enhance its natural environment. The City of Windsor's Official Plan designates land as Natural Heritage for natural heritage features within the identified Greenway System that are deemed environmentally significant or sensitive, including fish habitat, wetlands, significant woodlands, significant valleylands, significant wildlife habitat (SWH), and areas of natural and scientific interest (ANSI) that have been provincially designated. Other areas are designated as Environmental Policy Areas (EPAs), where the environment may be able to tolerate development activities. Sensitivity to Species at Risk (SAR) within these designated areas is also required when considering any community infrastructure projects. The designation of natural heritage features is further refined in the CR42 SPA Schedules; the Greenway System consists of Core and Non-Core Natural Heritage features. Core features include natural heritage features, whereas Non-Core features include stormwater management (SWM) infrastructure. Features included under the Natural Heritage and Core Area designations have been further characterized as Candidate Natural Heritage Sites (CNHS) in the 2008 Update to the Candidate Natural Heritage Site Biological Inventory by the City and ERCA.

4.1.1 Aquatic Environment

The Study Area is located within the Little River Subwatershed that has a drainage basin of approximately 65 km^2 (Stantec, 2017). This watershed is located in the southeast portion of the City and the western portion of the Town of Tecumseh. Drainage within the watershed is poor and dredged ditches along with tile drains were installed to improve the drainage and provide satisfactory conditions for agriculture (Chapman and Putnam, 1984). As a result, the majority of the natural drainage watercourses within this watershed have been realigned and experience fluctuations in water levels associated with precipitation events.

A review of OMAFRA AgMaps identifies twenty-six municipal drainage features within the Study Area. The Little River Drain/Little River is the main drain within the Study Area and it originates south of Highway 401 and generally flows north through a well-defined system of municipal drains towards the Detroit River and Lake St. Clair (Stantec, 2017). Rivard Drain, Lappan Drain, McGill Drain, Russette Drain and Branch of Russette Drain are located within the airport lands in the northwest portion of the Study Area (**Figure A4-1**). North Townline Drain, 7th Street Drain, 7th Concession Drain, Baseline Road Drain, 6th Concession Drain, Hayes Drain, 8th Concession Drain North and Demonte Branch and the Ray Road Drainage System are located within the west and southwest portions of the Study Area (**Figure A4-1**). The 9th Concession Drain, Hurley Drain, Hurley Relief Drain and Watson Drain are located within the southeast portion of the Study Area (**Figure A4-1**). Little 10th Concession Drain, Soulliere Drain, Desjardins Drain, LaChance Drain, Gouin Drain, Banwell Road Drain and Parent Outlet Drain are located within the northeast portion of the Study Area (**Figure A4-1**). Each of these drains eventually discharges into Little River or the Little River Drain.

Aquatic habitat assessments were completed by a Dillon biologist in 2019 and 2020 within the Study Area. All of the drains within the Study Area flow into the 6th Concession Drain, 9th Concession Drain or Little River/Little River Drain. The majority of drainage features within the Study Area are characterized as roadside or agricultural drains with intermittent flow regimes and abundant in-channel and riparian vegetation. Little River Drain/Little River has a permanent flow regime and is channelized south of Baseline Road, however exhibits characteristics of a natural watercourse between Baseline Road and Twin Oaks Drive within the Study Area. Both the 6th Concession Drain and 9th Concession Drain also have permanent flow regimes. The three aforementioned drainage features with permanent flow regimes are expected to provide direct fish habitat within the Study Area.

Based on review of background documents, there are no provincially or federally Threatened and Endangered aquatic species identified as having the potential to occur within the twenty-four municipal drainage features within the Study Area.

4.1.2 Terrestrial Natural Heritage Features

Based on the field investigations conducted in 2019 and 2020, the following terrestrial natural heritage features were identified within the Study Area.

Wetlands

As a result of the background review and ELC mapping, four wetlands were identified within the Study Area (**Figure A4-3**). In the northern part of the Study Area (i.e. within the Windsor Airport lands) there are three provincially significant wetlands (PSWs; Windsor Airport Swamps) associated with the CNHS #39 (Airport Woodlands; Windsor Airport Swamps [ER 23]). The remaining wetland is considered an unevaluated feature, and is located in the central part of the Study Area. The unevaluated wetland is associated with the CNHS #41 (Fairbairn Woods). Wetland significance should be re-evaluated during independent applications by landowners using more recent evaluation criteria and policy updates.

Woodlands

In total, eleven woodland areas were identified within the Study Area as a result of the background review and ELC mapping. Of the eleven woodlands, nine were characterized as Candidate Natural Heritage Sites (CNHS) by ERCA (**Figure A4-2** and **A4-3**; i.e., Airport Woodlands, CNHS #39 – consists of three woodland units within the airport property; Sundrop Bend, CNHS #40; Fairbairn Woods, CNHS #41; KOA Camp, CNHS #42, Ireland Farm Woods, CNHS #43, Wagon Wheel Woods, CNHS #44; and Baseline Woods, CNHS#45). In accordance with Table 1.0 of the City of Windsor Update to the CNHS Inventory (ERCA, 2008) features identified as CNHS #39, CNHS #40, CNHS #41 meet criteria for Significance (5 woodland units). These five corresponding woodlands were identified in Schedule B of the City's Official Plan under the Natural Heritage Areas designation. The remaining 6 woodland features mapped during ELC do not meet criteria for significance as they are considered too small (less than 2 ha in size) and were not found to provide habitat to SAR, SCC or locally significant species by ERCA (2008) or by Dillon during the 2019 or 2020 surveys. For each of the features noted above, woodland significance should be re-evaluated during independent applications by landowners.

Valleylands

Valleylands were not identified within the Study Area. While topography within the site is fairly consistent and flat throughout the Study Area, there is a slight elevation change associated with the channel of the Little River. The topography associated with the Little

River channel, is not considered a significant valleyland or ravine feature however, as it does not meet criteria for significance under Section 8.0 of the Natural Heritage Reference Manual (NHRM; Ministry of Natural Resources and Forestry (MNRF), 2015). Characteristics of the Little River were assessed against criteria of the NHRM (MNRF, 2014). As per Section 8.3.1 of the NHRM (2014), the Little River does not meet criteria for significance as it has less than 30 metres (m) of riparian habitat extending from the east and west banks. While some instances of canopy cover are present within the Study Area, the coverage is not contiguous and infrequently provides linkage opportunities to other natural areas identified in Schedule B of the City's Official Plan.

Area of Natural and Scientific Interest

No Life Science or Earth Science ANSIs (Areas of Natural and Scientific Interest) exist within the Study Area. The closest ANSI is Devonwood Conservation Area and is over 800 m to the west of the Study Area.

Significant Wildlife Habitat (SWH)

Criteria for determining SWH follow the guidelines outlined in the Natural Heritage Reference Manual (NHRM; MNRF, 2010), the Significant Wildlife Habitat Technical Guide (MNRF, 2000) and the Eco-region 7E Criteria Schedules (MNRF, 2015), where applicable. The Significant Wildlife Habitat Technical Guide (MNRF, 2000) defines SCC as globally, nationally, provincially, regionally, or locally rare (SRank of S1 to S3) as well as species listed as Endangered or Threatened federally, but do not include SAR (listed as Endangered or Threatened under the Endangered Species Act (ESA)). SCC are considered indicator species for several categories of SWH.

The full SWH habitat screening document is provided in **Appendix B-2** of the Sandwich South Natural Heritage Characterization Report. Based on the observations made during the field surveys, as well as the results of the ELC mapping, the following candidate and confirmed SWH were identified by Dillon within the following locations of the Study Area (**Figure A4-2**).

Candidate Significant Wildlife Habitat

- Bat Maternity Colonies (each of the deciduous woodland, forest and swamp communities).

Confirmed Significant Wildlife Habitat

- Terrestrial Crayfish:
  - Burrow identified in wetland habitat within CNHS #39 (Airport Woodlands).
- Special Concern and Rare Wildlife Species:
  - Eastern Wood-pewee (Special Concern):
    - Airport Woodlands, CNHS #39; and
    - Ireland Farm Woods, CNHS #43.
  - Wood Thrush (Special Concern):
    - Sundrop Bend, CNHS #40.
  - Eastern Stiff-leaved Goldenrod (SRank of S3):
    - Airport Woodlands, CNHS #39.
  - Giant Ironweed (SRank of S1?):
    - Airport Woodlands, CNHS #39,
    - 7th Concession Drain,
    - 6th Concession Drain,
    - KOA Kamp, CNHS #42, and
    - Mulberry Drive and Banwell Road.
  - Honey-locust (SRank of S2):
    - Sundrop Bend, CNHS #40; and
    - hedgerows around Service Road & Lauzon Parkway.
  - Shellbark Hickory (SRank of S3):
    - Airport Woodlands, CNHS #39
  - Climbing Prairie Rose (Special Concern):
    - Fairbairn Woods, CNHS #41; and
    - hedgerow between 9th Concession Road and 10th Concession Road.
  - Snapping Turtle (Special Concern):
    - Little River Drain north of Sundrop Bend, CNHS #40.

While candidate SWH was identified throughout the Study Area, it is noted that the majority of this habitat is associated with anthropogenic land uses (i.e., agricultural) and municipal infrastructure (i.e., drains). The presence of this potential habitat was assessed based on the existing vegetation communities, however further studies would be required during the Detailed Design phase to determine if it is still present in the landscape in advance of future development. Should SWH be confirmed,

additional mitigation and compensation may be required to accommodate this habitat in the landscape on individual properties within the Study Area.

Species at Risk Habitat

SAR are defined as those species listed as Endangered or Threatened under the Endangered Species Act (2007). Through background review, twenty-three SAR (Table 3 in **Appendix B**) were identified with the potential to occur within the Study Area; a full SAR screening document is provided in **Appendix B-2** of the Sandwich South Natural Heritage Characterization Report. Based on the observations made during the 2019 and 2020 field surveys, as well as the results of the ELC mapping, the following potential and confirmed SAR habitat was identified by Dillon within the Study Area (**Figure A4.3**).

Potential SAR Habitat

- Butler's Gartersnake (*Thamnophis butler*; Endangered):
  - All mixed meadow communities' adjacent to wet areas (municipal drains or wetlands) within the Study Area could provide suitable habitat for this species.
  - Potential habitat for this species is currently ruled out within the CR42 SPA because no snakes were observed during Artificial cover object (ACO) and Visual encounter surveys (VES) conducted by Dillon in 2017. Data is considered valid for five years; after this period, additional studies should be conducted to confirm or rule out potential habitat closer to the date of applications of independent landowners.
- Blanding's Turtle (*Emydoidea blandingii*; Threatened):
  - The swamp communities within Airport Woodlands, CNHS #39 and Fairbairn Woodland, CHNS #41 may provide suitable habitat for this species.
- Eastern Foxsnake (*Pantherophis gloydi pop. 2;* Threatened):
  - Swamp, woodland, forest, thicket and hedgerow communities within the Study Area may provide suitable habitat for this species.
  - Potential habitat for this species is currently ruled out within the County Road 42 Secondary Plan Area because no snakes were observed during ACO and VES conducted by Dillon in 2017. Data is considered valid for five years; after this period, additional studies should be conducted to confirm or rule out potential habitat closer to the date of applications of independent landowners.

- SAR Bats (Little Brown Myotis, *Myotis lucifugus;* Eastern Small Footed Myotis, *Myotis leibii*; Northern Myotis, *Myotis septentrionalis;* Tricoloured Bat, *Pipistrellus subflavus*; Endangered):
  - In accordance with the MNRF 2019 Ontario Recovery Strategy Series, all forest, swamp and woodland communities within the Study Area may provide suitable habitat for these species.
- Eastern Meadowlark (*Sturnella magna;* Threatened):
  - Most of the Study Area is actively farmed; there are no meadows in the Study Area that meet size criteria (greater than 4 ha with a minimum width of 200 m) for suitable breeding habitat (MNRF, 2015).
  - However, this species was observed by Dillon during 2017 breeding bird surveys within a mixed meadow community within the County Road 42 Secondary Plan Area.
- Chimney Swift (*Chaetura pelagica;* Threatened):
  - Species observed by Dillon incidentally within the Airport Woodlands (CHNS #39); suitable snags and cavity trees may be present in this community.
  - No large suitable chimneys were observed on buildings within Study Area during the 2019 and 2020 field studies.

Confirmed SAR Habitat

- Willowleaf Aster (*Symphyotrichum praealtum*; Threatened):
  - Individual plants were observed by Dillon during 2019 and 2020 vegetation surveys on the edge of a swamp community within the Airport Woodlands (CNHS 39).

While potential SAR habitat was identified throughout the Study Area, it is noted that the majority of this habitat is associated with anthropogenic land uses (i.e., agricultural) and municipal infrastructure (i.e., drains). The presence of this potential habitat was assessed based on the existing vegetation communities, however further studies would be required during the Detailed Design phase to determine if it is still present in the landscape in advance of future development. Should the presence of SAR and SAR habitat be confirmed, additional consultation and permitting with the MECP may be required for individual properties within the Study Area.

4.2 Cultural Environment

As a City rich in cultural resources, and situated along the Detroit River, Windsor is an area of high historical significance. Increasing development pressures encouraged the community to commission the development of the Windsor Archaeological Master Plan (2005) extent and complexity of its heritage. The City of Windsor is currently undertaking a comprehensive review of the Archaeological Master Plan, now referred to as the Windsor Archaeological Management Plan.

4.2.1 Cultural Heritage

The City's Official Plan sets the goals for heritage planning, which are to identify, recognize, protect, enhance and properly manage the City's cultural heritage resources. These resources include buildings, structures, archaeological and historic sites, landscapes and landmarks, either individually or in groups, which are considered to be of significant architectural and/or historic value. To that end, the City of Windsor maintains an online Cultural Heritage Register (July 2019) of the community's physical cultural assets and resources.

As part of this study, a Cultural Heritage Assessment Desktop Review was completed to identify potential areas of cultural heritage significance located near the lands where the proposed infrastructure could be developed. The information for this study was collected by reviewing existing heritage inventories, including the following:

- City of Windsor Municipal Heritage Register, as of March 24 2022;
- City of Windsor Official Plan, Volume II, Chapter 8 – County Road 42 Planning Area
- Cultural Heritage Assessment Report: Cultural Heritage Landscapes and Built Heritage Resources, Lauzon Parkway Improvements EA: Lauzon Road, Essex County Rd 42 and Future East/West Arterial Road, prepared by Unterman McPhail Associates, dated November 2013.

On June 24, 2021, Stantec completed a report entitled "Cultural Heritage Resource Assessment, Upper Little River Watershed Environmental Assessment" which lists the properties highlighted above and also completes a Cultural Heritage Value or Interest (CHVI) assessments for the entire study area. This report speaks to the impacts and mitigation measures required in order to facilitate the implementation of the identified SWM facilities. In addition to those lands, this study has recommended the

implementation of roadway, sanitary trunk sand water main trunk facilities. All proposed works will be implemented within the City's right of way and therefore not expected to have impacts to existing features. The implementation of road widenings and new collector roads will be assessed in more detail during the completion of future Schedule C project studies.

As indicated in **Table 4-1** below, five (5) sites in the Sandwich South Study Area have been listed on the Register ("R") as called for under the *Ontario Heritage Act.* For properties listed as "R" on the Register, property owners must make an application to the City if their intent is to demolish the property. The City will decide whether to pursue designation to protect the property or to allow for demolition. As indicated on the Municipal Heritage Register, there are no other heritage restrictions on these properties.

Section 8.3.2 in Volume II, Chapter 8 of the Official Plan states that prior to any development that may impact the cultural heritage resource being considered, a Cultural Heritage Evaluation Report (CHER) is to be completed and the appropriate mitigation of the impacts shall be determined.

Consideration of construction activities shall be suitably planned on a site by site basis, to avoid impacts to these identified cultural heritage resources. As required by the MCM, should Project activities require demolition or removal (in its entirety or partial) of any identified (known or potential) built heritage resource/cultural heritage landscape, a cultural heritage evaluation (CHER) and a Heritage Impact Assessment (HIA) shall be undertaken by a qualified person in consultation with the City of Windsor heritage planner. All technical cultural heritage studies shall be undertaken as early as possible during the detailed design stage of the project and prior to any final design being endorsed.

The recommendations from the CHER, if applicable, are to be implemented through subdivision or site plan agreements.

Table 4-1: Properties Identified as Having Cultural Heritage Value or Interest

Location	Name or Type of Building	Year Built	Reason for Consideration	Relevant Project	Potential Impacts	Mitigation Measure	Next Steps
2600 Airport Road (County Road 42)	Windsor Airport Hangar No. 41	1940	British Commonwealth Training School	Reconstruction of CR42	No Impact.	Assess during pre-design, if there will potential vibrational impacts. Modify design to mitigate construction impacts. Ensure protection of site is provided to avoid conflict with construction equipment access to the site. If required, implement vibration monitoring during construction.	Mitigation measures shall be implemented during proposed works.
5680 Baseline Road	William Ure House/Farm	1927	Ure Homestead	Reconstruction of Baseline Road	During construction activities, settlement in surrounding soils could cause damage to existing building foundations, structures. Increased construction traffic in close proximity to heritage resources could pose damage risk.	Assess during pre-design, if there will potential vibrational impacts. Modify design to mitigate construction impacts. Ensure protection of site is provided to avoid conflict with construction equipment access to the site. If required, implement vibration monitoring during construction.	CHVI shall be completed for this property prior to reconstruction of Baseline Road.
4601 County Rd 17 (10th Concession)	Dolphice St. Louis House	1932	Bungalow Style - Cobblestone	Reconstruction of 10th Concession Road and East West Arterial Road	During construction activities, settlement in surrounding soils could cause damage to existing building foundations, structures. Increased construction traffic in close proximity to heritage resources could pose damage risk.	Assess during pre-design, if there will potential vibrational impacts. Modify design to mitigate construction impacts. Ensure protection of site is provided to avoid conflict with construction equipment access to the site. If required, implement vibration monitoring during construction.	Will be reviewed as part of a future addendum to this Master Plan or and Additional Environmental Assessment.
4977 9th Concession	Patrick Hayes House	1892	Hayes Farmstead	Reconstruction of 9th Concession Road	During construction activities, settlement in surrounding soils could cause damage to existing building foundations, structures. Increased construction traffic in close proximity to heritage resources could pose damage risk.	Assess during pre-design, if there will potential vibrational impacts. Modify design to mitigate construction impacts. Ensure protection of site is provided to avoid conflict with construction equipment access to the site. If required, implement vibration monitoring during construction.	Will be reviewed as part of the future Schedule C Environmental Assessment for this roadway.
4639 9th Concession	John Hayes House	1914	Hayes Farmstead	Reconstruction of 9th Concession Road and East West Arterial Road	In addition to the potential impacts listed above related to Road Reconstruction, this property is also within the proposed stormwater management corridor.	Assess during pre-design, if there will potential vibrational impacts. Modify design to mitigate construction impacts. Ensure protection of site is provided to avoid conflict with construction equipment access to the site. If required, implement vibration monitoring during construction.	Will be reviewed as part of a future addendum to this Master Plan or and Additional Environmental Assessment.

A Construction Vibration Control Assessment may be required where construction activities from a proposed development may impact heritage resources on the property or in surrounding areas. The need for this type of assessment shall be completed during the pre-detailed design stage. The assessment may include:

(a) Analysis of all construction activities potentially causing vibration impacts on the heritage resources;

(b) Establishment of more stringent vibration criterion for heritage resource based on the potential for architectural and structural damage;

(c) Background vibration measurements of the site and surrounding areas;

(d) Predict extent of vibration impacts and identify all heritage structures within the vibration zone of influence;

(e) Conduct pre-condition survey to establish condition of existing heritage structures; and

(f) Recommend vibration mitigation and monitoring program with establishment of “do-not-exceed” threshold levels, and a construction vibration control plan.

The Construction Vibration Assessment is to be completed by a qualified vibration engineer, as a condition of development approvals, and to the satisfaction of City Administration prior to any building permit issuance.

4.2.2 Archaeology

Before approving land development projects, the City, is required to undertake an archaeological assessment of all lands that are part of the project. Assessments are required when the lands are known to have potential to have archaeological resources or have an archaeological site on them. Public development projects such as highway or road construction, or sewer construction require an archaeological assessment under the Environmental Assessment Act directly or through a Class Environmental Assessment. Once an archaeological assessment is completed it must be submitted to the Ministry of Heritage, Sport, Tourism, and Culture Industries (MHSTCI) for review to ensure the terms and conditions of the archaeological assessment were met and that any archaeological sites found were properly conserved.

As per correspondence between the City and MHSTCI, the entirety of the Sandwich South Lands requires, at minimum, a Stage 1 Archaeological Assessment. The CR42 SPA also includes policies for areas of archaeological potential (Section 8.3.2.2). Specifically, where development or infrastructure undertakings are proposed on lands containing

archaeological resources, the proponent shall conserve significant archaeological resources through documentation and removal or mitigation in advance of land disturbances, in accordance with the Ontario Heritage Act and the policies contained within the Windsor Archaeological Master Plan. Where any grading, construction or soil removal is proposed within 300 metres of a waterway or within 200 metres of County Road 42 or 10th Concession Road (County Road 17), a Stage 2 archaeological Study will be required.

Cultural Resource Management Group Ltd. ('CRM Group') prepared a summary of the archaeological assessments that have been conducted within the Sandwich South Lands and is provided in **Appendix C**. As documented in their summary, much of the Sandwich South Lands had been assessed during previous studies. Stage 1 Archaeological Assessments that were conducted as part of the scope of this project were on any lands that had not been included in previous assessments. The assessments and the MHSTCI approvals are documented in the following reports:

- Stage 1: Archaeological Assessment Report –Sandwich South Master Servicing Plan, Various Lots and Concessions, Geographic Township of Sandwich East, City of Windsor, County of Essex, Ontario, dated January 19, 2021 (2nd Revised Report); and

4.2.2.1 Stage 1: Archaeological Assessment Report –Sandwich South Master Servicing Report, East Pelton Secondary Plan, Parts of Lots 13 to 16, Concession 7, Geographic Township of Sandwich East, City of Windsor, County of Essex, Ontario, dated February 15, 2022 (3rd Revised Report). Sandwich South Master Servicing Plan, Various Lots and Concessions

CRM Group's Stage 1 archaeological assessment determined that 46 previously registered archaeological sites are located within one kilometre of the Study Area. A review of the physiography of the Study Area suggested that the Study Area was suitable for Indigenous agricultural practices and settlement. The proximity to Little River and historic transportation routes also indicates that the Study Area has potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on the soil conditions and the degree to which soils have been subjected to deep disturbances.

Both the background study and the property inspection determined that parts of the Study Area retain archaeological potential and thus will require a Stage 2 archaeological

assessment. Specific portions of the Study Area including existing roadways, commercial and residential buildings and associated driveways, as well as the Windsor International Airport, its buildings and runways are considered to be disturbed, therefore no further work is recommended in these portions of the Study Area.

Refer to **Appendix C** for the complete Stage 1 Archaeological Assessment for a more detailed description and figures of the Study Area.

4.2.2.2 Sandwich South Master Servicing Report, East Pelton Secondary Plan

CRM Group's Stage 1 Archaeological Assessment for the East Pelton Secondary Plan area determined that previously unassessed portions of the Study Area exhibit a moderate to high potential for the identification and recovery of archaeological resources. A review of the physiography of the Study Area suggested that the Study Area was suitable for Indigenous agricultural practices and settlement. The proximity to Litter River and historic transportation routes also indicates that the Study Area has potential for the identification of both Pre-contact Indigenous and Euro-Canadian archaeological resources, depending on the soil conditions and the degree to which soils have been subjected to deep disturbances. Seventeen previously registered archaeological sites are located within one kilometre of the Study Area.

In addition, previous assessments conducted by New Directions (Stage 1 Archaeological Assessment of the Lauzon Parkway, 10th Concession Road, County Road 42, Future East-West Arterial Road from Walker Road to 10th Concession Road Corridors, and The Sandwich South Secondary Plan, City of Windsor, County of Essex) and Stantec (Stage 1 Archaeological Assessment: Upper Little River Watershed Master Plan and Stormwater Management Plan) have identified significant portions of their respective Study Areas as exhibiting moderate to high archaeological potential and recommended Stage 2 Archaeological Assessment.

As such, a Stage 2 archaeological assessment is required for most of the East Pelton Study Area prior to any proposed impacts. Refer to **Appendix C** for the complete Stage 1 Archaeological Assessment for a more detailed description and figures of the Study Area.

4.3 Socio-Economic Environment

4.3.1 East Pelton Secondary Plan Area

The East Pelton Secondary Plan lands are bounded by Baseline Road to the north, 7th Concession Road to the west, Highway 401 to the south, and 8th Concession Road the east. Through OPA 74 (2009), the land uses include Commercial Centre, Major and Minor Institutional, Private Recreation, and Mixed Use in the southern portion of the planning area. Low and Medium density residential uses in the northern portion of the Secondary Plan area were approved through OPA 94 (2016). There is an open space corridor running along the northern extent which abuts the low density residential uses on Baseline Road.

The East Pelton lands contain the Windsor Christian Fellowship facility, as well as the provincial correctional facility, the Southwest Detention Centre. The Detention Centre is located near the northwest corner of 8th Concession Road and Highway 401.

The majority of the lands in the Secondary Plan Area are owned by private land owners. There are currently development proposals for both low and medium residential development in the northern half of the Secondary Plan area, with additional blocks being proposed for future development.

4.3.2 County Road 42 Secondary Plan Area

The County Road 42 Secondary Plan lands, which are located immediately south of the Windsor International Airport covers an area of approximately 400 hectares of the Sandwich South Study Area. The Secondary Plan area is relatively flat and is used primarily for agricultural uses at this time. There are pockets of small woodlots throughout the area, as well as some commercial and industrial uses, a place of worship, and rural residential lots. The majority of the lands in the Secondary Plan Area are privately owned by individual land owners.

The County Road Secondary Plan includes the Ray Road and Joy Road Residential Area, which are designated on Schedule A: Planning Districts and Special Policy Areas. This small established residential subdivision is located on Ray Road and Joy Road, east of 8th Concession Road and south of Baseline Road.

4.3.3 Windsor International Airport

The Windsor International Airport lies at the northern extent of the Sandwich South Lands. In 2010, an Airport Master Plan was established, with a large portion of the lands abutting County Road 42 being shown as 'Employment Lands' on the Airport Master Plan Land Use schedule. This same portion is designated as 'Future Employment Area' on Schedule D: Land Use of the Official Plan. There is currently an 8 hectare (20 acre) solar farm on the Airport Lands that is leased by Samsung. The remainder of the lands not occupied by the Airport operations are presently vacant.

4.3.4 Surrounding Land Uses

West of the Sandwich South Lands is a major commercial corridor along Walker Road. The lands to the east are similar to the Study Area and are comprised primarily of agricultural uses and low-density residential farm houses.

4.3.5 Official Plan Update

The City began the process of updating its primary Official Plan in 2012 and will be updating the plan through a series of Official Plan Amendments (OPAs). Although there have been a number of amendments that have been approved, OPA 86, which pertains to the Land Use section of the Official Plan, and OPA 87, to the Environmental Policies, have yet to be adopted and are being updating for consistency with the Provincial Policy Statement 2020. As these amendments pertain to the Sandwich South Lands, OPA 86 will provide the primary land use designations and policies for the City, including the County Road 42 Secondary Plan.

OPA 79, which was approved in 2012, is the Urban Structure component of the Official Plan (Section 3.4 and Schedule J), which identifies key elements including Nodes, Corridors, and Neighbourhoods. A Regional Employment Centre is shown on Schedule J in the Study Area at the northeast corner of the future Lauzon Parkway and County Road 42. A Regional Commercial Centre is also identified directly west of the East Pelton Secondary Plan Area.

4.3.6 Growth Forecasts - City of Windsor Development Charges Background Study

A review of the City of Windsor's Development Charges was completed in 2020 by Hemson Consulting Ltd. (Hemson) for the City of Windsor. The purpose of the study was

to establish development charge by-laws that comply with the *Development Charges Act, 1997* (DCA) and its associated *Ontario Regulation 82/98* (O. Reg. 82/98).

This study included preparing a development forecast, establishing historical service levels, determining the increase in need for services arising from development and appropriate shares of costs, attribution to development types – such as residential and non-residential, and the final adjustment to the calculated rate of cash flow analysis. As part of this work, Hemson provides a population projection to 2041, which estimates a total population of 239,989. The population growth within the next decade is projected to increase the City of Windsor's population by 10,433. The population projection is presented below in **Table 4-2.**

Table 4-2: Population Forecast, 2020 to 2041 - Hemson Consulting Ltd., 2020

Year	Census Population	Census Population Growth
2020	220,991	962
2021	221,957	966
2026	227,189	1,056
2031	232,671	1,107
2036	237,073	887
2041	239,989	586
2020-2029 Total	N/A	10,433
2020-2041 Total	N/A	19,960

Source: Table 5: City of Windsor Population, Household & Employment Forecast Summary.

In addition, the Hemson Study provides projections for the anticipated amount, type, and location of both residential and non-residential development. This includes a City-wide forecast of the total population, occupied dwellings, new dwellings, total employment, employment growth in new space, and the growth of non-residential building space in square metres from 2020 to 2029. Through the City-wide non-residential development forecast, it is estimated that by 2029 the employment growth will be over 2,700 jobs. Since the completion of that study, the introduction of the proposed Battery Plant and supporting feeder plants will result in a higher growth rate in the future.

In this same period the total Gross Floor Area (GFA) growth for employment is forecast at 188,330 square metres. The same forecast over the same period excluding the Sandwich South Planning District anticipates 340 new jobs and to be accommodated in 28,420 square metres of GFA for employment purposes.[1]

The Hemson Study also includes forecasts for the Sandwich South Planning District for the 2020 to 2041 time period. In this period, it is anticipated that the total population in new units is forecast at 14,210 and an increase of 4,999 dwelling units. In this same period, 9,486 new jobs are anticipated with 706, 879 square metres of GFA to accommodate the employment purposes[2]. This is at a rate of employment growth of 430 new jobs and 32,131 square metres annually. For the 2020 to 2041 time period, employment is forecast to increase by 6,089 jobs for the rest of the City[3]. As per the Study, the majority of employment growth is anticipated to occur in the Sandwich South Planning District.

4.4 Existing Municipal Infrastructure

Existing infrastructure within the South Sandwich Study Area includes: roadways, municipal drains, sanitary and storm sewer systems, watermains and other utilities. The SSMSP Municipal Functional Design Report in **Appendix F** provides a detailed description of existing conditions. Below provides a summary of those conditions.

Roadways

The existing area is serviced by a framework of Arterial roadways and Collector Roadways. All roadways are currently rural cross sections that provide access to existing properties as well as act as a linkage for areas outside of the Study Area. The SSMSP

[1] Employment Density was calculated at 60.0 m^2 for Non-Industrial uses and 100.0 m^2 for Industrial uses

[2] Appendix A – Table 15: City of Windsor, Sandwich South Planning District, Employment Growth in New Non-Residential Space by Category

[3] Appendix A - Table 5: City of Windsor Population, Household & Employment Forecast Summary

Transportation Report included in **Appendix F** provides details on the existing network configuration and traffic volumes. Also see **Section 4.6** for more details.

Sanitary Trunk Sewers

The sanitary sewer system conveys domestic sewage via local service connections from residential, commercial, industrial, institutional and other land uses to a wastewater treatment plant where it is filtered, treated and discharged. This area is served by both the Lou Romano Water Reclamation Plant (LRWRP) and Little River Pollution Control Plant (LRPCP). Refer to **Figure A4.0** to see the existing sanitary sewer network and the delineation of drainage areas. Trunk sanitary sewers have been constructed on 8th Concession Road, CR42 and Lauzon Parkway which discharge sanitary sewers north to the LRPCP.

Where sanitary sewers do not exist, homes and businesses are generally serviced by private owned and maintained septic systems. As new sanitary sewers are constructed, properties are required to connect to the new sanitary sewer. More information is included in **Section 5.7.1** below.

Municipal and Roadside Drains

Due to the nature of the rural landscape the area is currently serviced by a series of Municipal and roadside drains. Existing developed areas have internal networks.

Currently all drainage is serviced through surface drainages or via farm tiles. See **Section 4.5** for more details.

Watermain

Water distribution infrastructure exists throughout the Study Area, along existing municipal right-of-way limits. Enwin Utilities Ltd. (formerly Windsor Utilities Commission) owns and operations the water distribution system. The existing watermain network consists of watermains that range in size from 150 mm dia. to 200 mm dia. which provides service to existing homes and business. Figure A7.0 illustrates the existing water distribution network. More detail on the existing water distribution infrastructure is included in the WUC Water System Master Plan 2016 Update, dated Nov. 6, 2020.

Other Utilities

There are existing power, gas and telecommunications along existing right-of-ways within the Study Area that provide direct connection to local customers as well as route to areas outside of the Study Area. Power distribution is routed via aerial pole lines whereas gas and telecommunications are typically buried with the ROW. The following utilities have infrastructure within the Study Area.

- Hydro One – Power Distribution
- Enbridge – Natural Gas
- Bell Canada – Telecommunications
- Cogeco Connexion – Telecommunications
- MNSi – Telecommunications
- ENWIN Hydro (in Airport north lands)

4.5 Current Drainage Characteristics

The Study Area is serviced via municipal and roadside drains that provide overland flow drainage for agricultural lands including connection for field drainage tiles.

All drains generally drain east and north along the existing topography and discharge to the Little River Drain. Greater detail on the existing drainage conditions are referenced within this Master Plan's Stormwater Management Technical Report (Draft 2022) (Appendix D) and the Little River Regulatory Flood Line Hydrological and Hydraulic Reports (Dillon, Draft 2022).

There are currently no existing trunk storm sewers servicing the Study Area, however there are enclosed culverts on Joy Road and Baseline Road within the Study Area.

A summary of changes to the existing drains proposed to facilitate the first phases of development area is detailed in **Section 6.5** below.

4.6 Transportation

The City of Windsor Official Plan[4] includes a number of roadway network classifications which include:

- Class I & II Arterial Roads (County Roads)
- Class I & II Collector Roads

Cycling facilities may be permitted on any of these roadway categories.

Class I Arterial Roads are controlled access highways designed to carry high volumes of passenger and commercial traffic for intra-city travel at moderate speeds. They have a minimum right-of-way width of 46 metres, with no direct property access or on-street parking.

Class II Arterial Roads are designed to carry high volumes of passenger and commercial traffic for intra-city travel at moderate speeds. Right-of-ways are to be no more than 42 metres. Direct property access is discouraged but on-street parking is permitted.

Class I Collector Roads are designed to carry moderate volumes of traffic with right-of-way no more than 28 metres wide. Direct property access permitted with some controls.

Class II Collector Roads: Class II Collector Roads are designed for moderate volumes of traffic. Right-of-ways are to be no more than 26 m, with direct property access permitted with some controls.

Right-of-way widths listed above are recommended but do not always reflect the width of existing road allowances. Many collector roadways have ROW widths of 23 m or less.

The remaining streets are scenic or local roads, designed to carry low to moderate volumes of traffic. Right-of-way widths are a minimum of 20 metres with direct property access permitted.

[4] City of Windsor, Official Plan, Volume I, Infrastructure.

4.7 Climate Change

Climate change is the shift in weather patterns associated with an increase in global average temperatures. In Windsor, climate change appears to be increasing the rainfall intensities and volume, with corresponding severity in flooding. The City completed a Climate Change Adaptation Plan, entitled Degrees of Change, in 2020 which provides a guideline on actions that should be taken to meet specific climate change objectives and create a more resilient city. Also, the City has prepared a Community Energy Plan which highlights how the Sandwich South area is planned to be a 'Net-Zero' Neighbourhood, where "A net zero energy district is a place where no more energy is consumed than is supplied by non-fossil fuel sources to approach zero emissions".

It should be noted that the City has been successful in obtaining funding to complete a Sustainable Neighbourhood Action Plan for this area. Following this study, the City will be undertaking a separate study that will provide recommendations pertaining to development and implementation that will meet the objectives of a 'Net-Zero' Neighbourhood.

Climate change and adding resilience to the proposed municipal infrastructure servicing plan has been considered throughout this project. Below summarizes key ways Climate Change has been integrated into the servicing plan for this Study Area.

- Incorporate ways to make drainage infrastructure within South Sandwich resilient to potential changes in the frequency and significance of storm events;
- Introduce an Active Transportation network and recommendations for the expansion of the Transit system to support a more balanced modal split;
- Incorporate a right-of-way corridor for future thermal heat distribution network (similar to District Energy system); and
- Prepare a plan that is consistent with the natural environment components outlined in the Secondary Plans.

The functional servicing report in **Appendix F** will provided more detail on the implementation of these items. The City is undertaking a Sustainable Neighbourhood Action Plan (SNAP) to provide further guidance on addressing climate change.

5.0 Identifying Solutions

To address the problems and opportunities noted in this master plan, a number of alternative solutions were developed and evaluated under each servicing category. The rationale for the development of solutions is described in this section in more detail. The evaluation of these options is based on criteria, formed as questions and based on the project objectives. The evaluations were completed based on a qualitative comparison of solutions with the preferred solution being that which best met the project objectives.

Objectives & Evaluation Criteria:

- Objective: Manage flood risk (applicable for stormwater solutions only)
  - Criteria: To what extent can the alternative address surface flooding?
- Objective: Protect quality of life
  - Criteria: Is there potential property acquisition that would be required?
  - Criteria: What are the potential impacts to cultural heritage (archaeology and built heritage)?
  - Criteria: What are the potential construction related impacts?
  - Criteria: Are there long-term operation impacts on local residents and businesses?
  - Criteria: Are there potential recreation opportunities?
- Objective: Be cost effective and provide value
  - Criteria: What is the relative cost of the alternative?
  - Criteria: Are there opportunities to reduce overall cost and/or reduce costs to taxpayers?
  - Criteria: What is the local economic benefit?
  - Criteria: What is the level of complexity for construction and operation?
- Objective: Protect the natural environment
  - Criteria: What are the environmental effects of the alternative?
  - Criteria: Will there be impacts to species at risk?
  - Criteria: Is there an opportunity to protect natural spaces?

- Objective: Support the creation of a complete community
  - Criteria: Does the alternative support active modes of travel?
  - Criteria: Does the alternative support a self-sufficient community?
  - Criteria: Does the alternative provide an accessible solution?
- Objective: Protect health and safety
  - Criteria: Will this alternative reduce risk?
  - Criteria: Will this alternative improve safety?
- Objective: Align with existing infrastructure and studies
  - Criteria: How compatible is the alternative with existing and surrounding infrastructure?
- Objective: Build in resiliency
  - Criteria: How are infrastructure alternatives resilient to climate change?
- Objective: Build in flexibility
  - Criteria: What is the potential for phasing the infrastructure alternative?
  - Criteria: How flexible and adaptable is the alternative to change?
  - Criteria: Does the alternative allow us to accommodate future population and employment growth?

Detailed description of the rationale for the selection of alternatives and assumptions are detailed in **Section 5.3** and **5.2** below and the evaluation of alternatives are detailed in **Appendix G.**

5.1 Future Development Conditions

Solutions to service proposed development are based on the road network, land uses and population density that have been established through the completion of previous studies for the Study Area and referenced in **Section 1.1** above. This study is using the established land use as a basis for all development servicing solution development and functional design. This study will not re-evaluate or propose changes to these land uses however where possible if refinement to servicing areas required can be identified to reduce the required acquisition of private property those opportunities will be identified.

Table 5-1 summarises the designated land uses as shown in the **Figure A1.1** Land Use Plan and their approximate area. Only as the City approves individual developments will any changes be made to the designated land uses. In the interim, this study will not trigger the change in land uses from their currently zoned status.

Table 5-1: Land Use Designation Areas (To be complete after the City's Functional Design Report Review)

Land Use	East Pelton (Ha)	CR42 (Ha)	Sandwich South (Ha)	Total (Ha)
Low Density Residential	75.80	119.62	16.48	211.9
Medium Density Residential	5.64	13.57	31.58	50.79
Mixed Use	14.78	12.12		26.90
Commercial	26.72	1.63		28.35
Minor Institutional	15.77			15.77
Private Recreation	5.33			5.33
Major Institutional	12.09	24.25		36.34
Business Park Type I		51.94		51.94
Business Park Type II		32.81		32.81
Future Urban			240.51	240.51
Future Employment			561.84	561.84
Solar Farm			105.06	105.06
Future Mixed Use			23.58	23.58
Future Regional Park			17.24	17.24
Open Space / ROW / SWM / Natural Heritage	47.90	144.52	455.22	647.64

5.2 Sanitary Sewer Servicing

The intent of this study is to provide a framework for sanitary servicing to provide guidance for organized development within the Study Area.

> **Problem/Opportunity:** Provide guidance for the construction of sanitary trunk sewers and future servicing of development areas. Refine the sanitary design based on the approved land use plan and projected population yields and incorporate trunk infrastructure in the proposed staging plan.

Sanitary sewers are required to provide an outlet for wastewater produced from development within the sanitary drainage area. Wastewater is conveyed downstream via trunk sanitary sewers to the City's existing treatment plants to treat the wastewater prior to discharge into the Detroit River. The SSMSP Study Area is broken down into two main sanitary drainage areas, draining to the Little River Pollution Control Plant (LRPCP) drainage area (2018 ha) and the Lou Romano Water Reclamation Plant (LRWRP) drainage area (68 ha) as show in **Figure A5-0**. Under ultimate conditions the majority (97 %) of the SSMSP area to proposed to discharge to the LRPCP.

The ultimate sanitary servicing strategy for the SSMSP area was outlined in the SS Sanitary EA completed in 2006 and updated in 2014. This report identified the trunk sanitary sewer network required to serve the estimated population as well as a set of established design criteria. This study also identified that, in order to serve the full Sandwich South Area, the capacity of the LRPCP will need to be expanded. An assessment of the existing and proposed LRPCP treatment capacity has been completed and is described in more detail in **Section 5.7.1.2** and is included in **Appendix F Functional Servicing Report.**

Since the completion of the 2014 study, portions of the trunk sanitary sewer network have been constructed, including trunk sewers along Lauzon Parkway, CR42 and 8th Concession Road as shown in **Figure A5-0.** The remaining trunk sewer segments on 9th Concession Road and 10th Concession Road have not been constructed and, through this study, the trunk sizes proposed have been reviewed and revised as described in **Section 5.7.1.** The need to construct these trunk sanitary sewers is based on development demand and the installation shall also correspond to improvements to the road corridors as needed to support development. See **Section 6.4** for more information regarding the staging and implementation of sewer improvements.

It should be noted that as sanitary trunk sewers are constructed, property owners fronting those sewers are required to connect to the municipal systems. Property owners will be assessed a fee for the construction of these municipal services per City of Windsor user fee schedule. As sanitary trunk sewers are constructed, property owners will be notified in advance as it relates to these charges.

Internal development areas will require local sanitary sewers that will provide direct connection for internal subdivisions and new parcels. Sanitary sewers are proposed to

be within existing road allowances or in some cases within new road. As such, sanitary trunk sewer construction is considered a Schedule A+ project under the Municipal Class Environmental Assessment (MCEA) and alternatives were not considered. The sewers, shown in **Figure A5-0,** represents the main trunk sanitary sewers that will act as the framework for the internal sanitary sewer network required to serve local development. Sanitary sub-trunks and local sewers will need to be implemented along local right-of-ways to serve the proposed land use. Refer to **Section 5.7.1** below regarding functional design details.

5.3 Stormwater Management

To support development, the implementation of stormwater management (SWM) measures is required to provide local drainage and to ensure that increased area imperviousness and changes to runoff does not pose increased flood risk downstream. This study shall develop SWM solutions to support anticipated development in this Study Area.

> **Problem/Opportunity:** SWM facilities are required to provide quantity and quality control. Provide a comprehensive SWM servicing strategy to provide quantity and quality control for development and to confirm storm sewer servicing meets the established level of service and develop a plan for improvements of municipal drains that will act as the stormwater outlet.

Stormwater management refers to the collection, treatment and discharge of rain or snow melt derived runoff prior to discharge to downstream streams, rivers and lakes.

The SWM and drainage strategy for the SSMSP area was documented in the Upper Little River Watershed Master Drainage and Stormwater Management Plan Environmental Assessment Study (ULR MP) (2022). Several SWM alternatives were evaluated through this master plan. The preferred alternative to serve development lands was the use of "Grouped Off-Line stormwater management controls". Ponds will be off-line, meaning that stormwater will be collected within facilities upstream of the existing drainage network. Ponds are proposed to be placed within designated stormwater corridors that are adjacent to the municipal drains, servicing designed drainage areas comprised of multiple properties and land uses. These will be regional facilities that have consolidated outlets to the downstream of the drainage system. Regional facilities will eliminate the need for individual developments/properties from having onsite facilities to meet

regional SWM standards as defined by the SWM Manual. This is a cost-effective configuration, reducing the number of facilities to be maintained in the future. It also relies on SWM corridors that promote natural environment linkages along watercourses and greenways.

The work on the SSMSP is based on the results of this previous work and further considers options for implementing "Grouped Off-Line" SWM controls. This study also aims to integrate the SWM design within the proposed transportation network, to avoid conflicts with the trunk sanitary systems, to better reflect the established land use plan and better represent a design that is functional and implementable within the existing landscape.

5.3.1 Identifying Stormwater Management Alternative Solutions

There are a number of design options to implement "Grouped Off-line" stormwater management controls. Five high level alternatives, shown in **Table 5-2** were considered for surface flooding management.

Table 5-2: Stormwater Management Alternatives

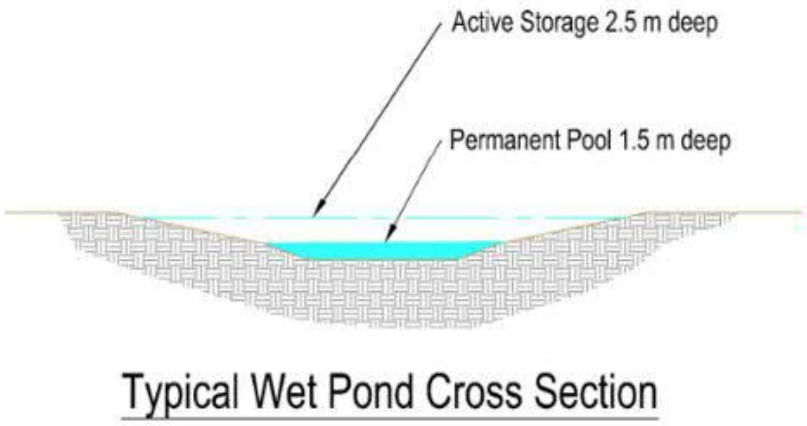
Alternative	Description
Do Nothing:	Implements no site controls for surface water quality or quantity control.
Option 1a:	Wet ponds with a permanent pool of water.
Option 1b	Wet ponds complemented by Low Impact Development (LID) controls throughout the neighbourhood within the City's right-of-way. These controls include underground storage, permeable pavement and vegetated features to help mimic the natural water cycle.
Option 2a	Dry ponds with on-site quality control measures.
Option 2b	Dry ponds with on-site quality control and Low Impact Development (LID) controls similar to described under Option 1b above.

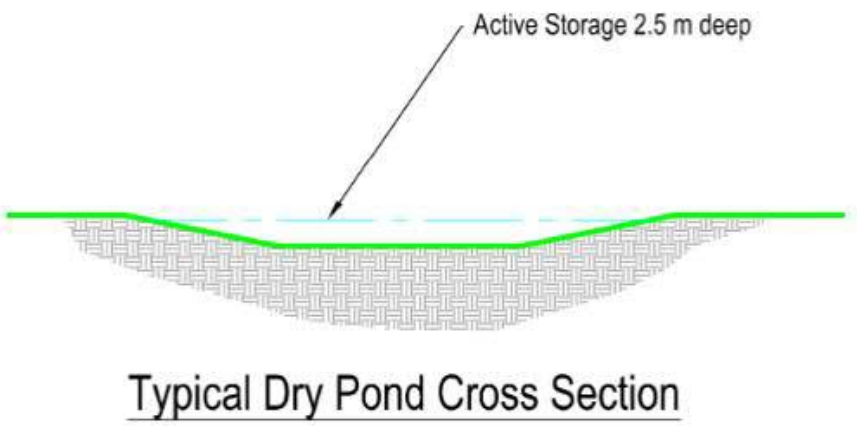
Each SWM facility shall be equipped with a stormwater pumping station that draws stored stormwater from the ponds, up and into the downstream drains. Based on the allocated stormwater corridor areas and existing topography, under all of these options,

the required pond bottom and upstream storm sewer are deeper than the existing municipal drain network. No specific pumping station alternatives will be considered.

Figure 5-1 below shows the difference between the wet and dry ponds described within the options above, including a typical cross-section, and a sample image of the constructed facility. Note that these are examples, and do not necessarily reflect the design of the ultimate preferred option facilities.

Figure 5-1: Typical Cross-Section and Images of Wet Pond (Left) and Dry Pond (Right)





Stormwater pumping stations (PSs) are required to provide an outlet from each SWM facility to the respective municipal drainage outlets. The PSs are sized based on the corresponding drainage area and the maximum outflow rate mandated within the Upper Little River Watershed Master Drainage and Stormwater Management Plan (ULRMP). The ULRMP study completed hydraulic analysis that determined the maximum outflow that could be accommodated by the downstream Little River and tributary drains. Peak flows from each pumping station shall not exceed the following rates:

- 3 litres per second per hectare (L/s/ha) for a 1 to 2 year return period storm event;
- 4 litres per second per hectare (L/s/ha) for a 1 to 5 year return period storm event;
- 6 litres per second per hectare (L/s/ha) for a 1 to 100 year return period storm; and event.

Pumping stations are required to provide the following:

- Control outlet flows based on the maximum outflow rates listed above;
- Provide 48 hour draw down of the active storage areas of the ponds;
- Due to the relatively flat topography, the PS will lift the stormwater runoff collected in the ponds and discharge flows to the shallower municipal drains; and
- For Wet Ponds, provide a subdrain inlet to allow ponds to fully drain periodically for maintenance;
- Hydraulically disconnect each SWM facility from the downstream municipal drains to mitigate risks associated with back up of the drain into the facility, which would leave the upstream and downstream areas susceptible to flooding.

Placement of SWM Ponds also considers the need to provide major overland flow routes which allow surface drainage to drain overland to the ponds to be stored prior to discharging to the downstream drains, up to and including a 1 to 100 year event. Under major rainfall events, overland flow of stormwater along road corridors will need to be directed to the proposed facilities via municipal right-of-ways. Safety and access must be maintained under these conditions and will need to be refined as part of the detailed design of the proposed SWM and Road networks. In addition, where possible, one dry lane shall be provided along collector and arterial roadways.

5.3.2 Evaluation of Stormwater Management Solutions – East Pelton and CR42 SPA

The five surface flooding management options were comparatively evaluated using the criteria noted in **Section 5.0**. A detailed evaluation table is included in **Table G-1** in **Appendix G Municipal Servicing Alternative Evaluations.**

The preferred solution was determined to be Option 1a – Wet Stormwater Pond (SWM) facilities based on the following:

- ✓ Wet Ponds provide water quality control to mitigate the need for inline or onsite quality controls which are costly, difficult to maintain to ensure proper effectiveness;
- ✓ Wet Ponds require less frequent regular maintenance in contrast with dry ponds that will require upstream quality control infrastructure that will require more frequent maintenance;
- ✓ Lessens the burden of private property owners to own and operate site-specific SWM infrastructure;
- ✓ Can more easily accommodate added resiliency to account for climate change;
- ✓ Meets all SWM Regional requirements;
- ✓ Ponds can be designed to minimize permeant pool widths by implementing long linear, meandering ponds;
- ✓ Must consist of features to mitigate water fowl (as required to meet Transport Canada Guidelines);
- ✓ Design consideration for plantings and landscape for waterfowl mitigation along the banks including trees and woody shrubs; and
- ✓ Consideration for initial waterfowl mitigation after pond construction prior to the growth of mature vegetation.

Stormwater facilities, including the ponds, storm sewer inlets, pumping stations and outlets to the downstream municipal drains are Schedule B Projects. There is a total of 6 proposed SWM facilities within the two Secondary Plan Areas as follows:

- P1 – North East Pelton Pond
- P2 – South East Pelton Pond
- P3 – Southwest CR42 Pond
- P4 – Northwest CR42 Pond

- P5 – Northeast CR42 Pond
- P6 – Southeast CR42 Pond

Approval of this study will allow the City to proceed with property acquisitions and construction of these facilities with the East Pelton and CR42 Secondary Plan Area.

5.3.3 Identifying Stormwater Management Solutions for the Expanded Scope Area/Lauzon Parkway

It has been identified that the road improvements associated with the Lauzon Parkway and CR42 will be required to support the initial stages of the two secondary plan areas and the Airport Employment lands developments and; therefore; SWM solutions to serve the roadway and adjacent lands shall also be addressed as part of this study. Two servicing alternative solutions to implement SWM for the service areas were reviewed and compared to a "Do Nothing" alternative. The two servicing solutions represent different storm drainage area configurations and staging scenarios and are described in **Table 5-2** below.

Table 5-3: Stormwater Management Alternatives for the Lauzon Parkway and Airport Drainage Areas

Alternative	Description
Do Nothing: No Stormwater Management	Represents a scenario where SWM facilities are not implemented to serve the proposed roadway and developable area north of CR42 and instead uncontrolled runoff is conveyed directly to existing drains including the Little River.
Option A: Stormwater Management for Lauzon Parkway and the Drainage Area North of CR42	New regional SWM facilities (P7 and P8) to serve the Lauzon Parkway/CR42 Intersection and developable areas north of CR42. A total Drainage Area of approximately 113 Hectares would require approximately 16.1 Hectares of land to accommodate the SWM facility area. Refer to **Figure A5-2A** which depicts the size and location of the stormwater management ponds.

Alternative	Description
Option B - Stormwater Management for Lauzon Parkway and the Drainage Areas North and South of CR42	New regional SWM facilities (P7 and P8) the Lauzon Parkway/CR42 Intersection, CR42 road right-of-way, future development areas north and south of CR42. A total Drainage Area of approximately 210 Hectares would require approximately 34 Hectares of land to accommodate the SWM facility area. Refer to **Figure A5-2B** which depicts the size and location of the stormwater management ponds.

Two facilities are required to serve the drainage area described above. The portion of lands between Little River and the existing Lauzon Parkway right-of-ways are expected to drain to a future SWM facility (P7), east of Little River. A separate facility is required due to constraints related to a storm sewer crossing of the Little River. The remaining lands will contribute flows to the P8 facility.

The drainage areas depicted under Option A and B, in **Figures A5-2A** and **A5-2B**, are based on the existing and proposed drainage patterns within the southeast corner of the Windsor International Airport (the Airport) property. Based on existing topography and drainage patterns, the ULRMP reserved separate stormwater management corridors to serve areas north of the former Rivard Drain. Those areas as assumed to drain to the will not be incorporated into this analysis and those areas will drain northeast through the existing McGill, Russette and Lappan drains. The existing drain that bisects the Provincial Significant Wetlands (Referenced in **Section 4.1.2** above) and discharges to the former Rivard Drain will remain as is, to continue to provide drainage for these wetlands. A minimum 30 metres (m) planted buffer zone is required around the PSWs and the proposed SWM Facilities cannot encroach on this buffer area. Areas within the Airport property, north of the drainage area (purple area) will continue to drain to the existing McGill Drain within the Airport lands.

The portion of CR42, between the existing Lauzon Parkway right-of-way and the City and Town of Tecumseh border will continue to drain to the Little Tenth Concession Drain. Upon construction of CR42, the existing Little Tenth Concession Drain crossing shall be maintained. Sizing of this or any culvert crossings shall be confirmed as part of the detailed design stage of that project. Upon development of the lands that contribute to the existing Little Tenth Concession Drain, SWM ponds shall be implemented to provide

the necessary runoff quality and quantity control. These areas are not part of the scope of this project.

From a development staging perspective, there is opportunity to stage the construction of the proposed SWM ponds to exclude those future development areas within the Airport Lands.

Since CR42 is an arterial road, which acts as a main emergency access route for emergency vehicles (fire, police and ambulance), the overland flow from areas south of CR42 shall continue to drain to P4, south of CR42 to avoid overtopping CR42. The storage volumes and storage facility footprints provided for P4 have been sized based on this design constraint.

5.3.4 Evaluation of Additional Stormwater Management Solutions for the Expanded Scope Area/Lauzon Parkway

The three options listed above were comparatively evaluated using the criteria outlined in **Section 5.0**. The following summarizes the results of the evaluation with a more detailed evaluation **Table G-2** in **Appendix G**. The overall preferred solution is based on the relative comparative result of each criteria.

The first alternative considered is a 'Do Nothing' option that assumes that SWM facilities will not be constructed to provide water quality and quantity control for the Lauzon Parkway Improvements or development areas. This would pose both flooding and environmental risks to the downstream watercourse as the uncontrolled and untreated increased runoff would not meet the minimum ERCA and Provincial Standards.

The facility proposed under Option A, has a smaller footprint compared to the facility proposed in Option B, as the associated drainage area only includes those areas north of the CR42 right-of-way. This would meet minimum ERCA and Provincial Standards and mitigate negative downstream impacts, however would not provide the opportunity to reduce the size of the SWM facilities proposed south of CR42.

Option B was determined to be the preferred alternative based on the following:

- Reduces direct impact on private property lands that can provide a more desired development scenario. Pond P4 can be reduced in size as shown in Option B **Figure A5-2B**;
- SWM facility utilizes non-developable lands designated as 'open space' through the City's Official Plan;
- Will provide for a feasible SWM solution and sufficient storm outlet for the first phase of the Lauzon Parkway Improvements; and
- From a staging perspective, these SWM facilities will be required to facilitate the transportation needs within this area, while also servicing all portions of the CR42 secondary plan area that front CR42. This would optimize quick development of lands already serviced by sanitary trunk sewers.

The following was considered in the evaluation of alternative SWM strategies.

- The SWM facility P7 has been located adjacent to Lauzon Parkway to facilitate the shortest and most direct outlet location for the proposed storm sewer system and outlet into the Little River. It is currently not feasible to locate P7 west of the roadway as there is existing utility and sanitary sewer infrastructure that will remain along the abandoned portion of Lauzon Parkway.

5.3.5 Alternative Solutions – Stormwater Management Facility Configuration for the Expanded Scope Area/Lauzon Parkway

Four servicing alternatives to implement SWM facilities in the Lauzon Parkway area were reviewed based on the preferred drainage area delineation Option B noted above, these options are detailed in **Table 5-4**. These solutions evaluated the footprint as well as the type of pond (dry vs wet). These ponds are proposed within lands currently within the Airport lands and therefore the use of dry ponds where compared as well.

Table 5-4: Stormwater Management Alternatives for the Lauzon Parkway, CR42 and Airport Drainage Areas

Alternative	Description
Option B1: Wet Ponds - One Linear Pond	Utilize wet ponds (P7 and P8) to provide both water quantity and quality control of stormwater using a permanent water quality control pool and forebay. P8 will consist of one long linear pond that discharges to the Little River drain via a stormwater pumping station.
Option B2: Wet Ponds - Two Parallel Ponds	Utilize wet ponds to provide both water quantity and quality control of stormwater using a permanent water quality control pool and forebay. This option is similar to Option B1, however P8 will consist to two parallel twin ponds that discharge to the Little River drain via a stormwater pumping station.
Option B3: Dry Ponds and Underground Quality Control	Utilize a dry pond to provide water quantity control of stormwater. The pond is expected to remain dry, "empty", between rain events. To provide water quality control of runoff, each storm sewer outlet to the pond will need to be equipped with oil and grit separator unit(s) (OGS) and underground quality control unit chambers (ADS Isolator Row Plus or approved equivalent) adjacent to the footprint of the dry pond. The OGS and underground chamber water quality control units must be sized to meet the minimum quality control requirements (Normal Level of Treatment per the MECP Manual and particle size distribution per the Regional SWM Guidelines).
Option B4: Underground SWM Quality and Quantity	Utilize a fully underground SWM facility that provides both water quantity and quality control of stormwater to meet the minimum quality control requirements (Normal Level of Treatment per the Ministry of the Environment, Conservation and Parks (MECP) Manual and particle size distribution per the Regional SWM Guidelines). To supplement water quality control of runoff, each storm sewer outlet to the underground facility will need to be equipped with oil and grit separator unit(s) (OGS) and quality control unit chambers (ADS Isolator Row Plus or approved equivalent).

Figure 5-3C - Option B Alternatives shows the approximate footprint of the SWM facilities for Options B1-B4 outlined in **Table 5-4**.

Pumping stations of the same capacity and in the same locations are required for all the surface flooding SWM alternatives.

The following assumptions and considerations were identified during the evaluation as it relates to these alternative SWM strategies:

- The size, location and orientation of the preferred SWM facility would be refined as part of the functional design phase of this project; and
- The design team is coordinating with the Airport staff to develop a functional design and adaptive management plan that will mitigate waterfowl habitat and provide a long-term plan for operation of the ponds over their lifecycle for all surface storage SWM options. The adaptive management plan will be included in the final SMP report.

Table G-3 in Appendix G, details the comparative evaluation between the SWM facilities, as described above.

5.3.6 Evaluation - Stormwater Management Facility Configuration

The four SWM facility configurations were comparatively evaluated using the criteria previously noted.

Preferred Alternative: Option B2

The preferred alternative includes the incorporation of two Parallel Wet Ponds to service the Lauzon Parkway/CR42 area, as shown in Option B Alternatives **Figure A5-2C**. This layout is the most preferred, compared to Option B1, as it provides for a consolidated and regional SWM facility that is in closer proximity to the Little River Drain, and better consolidates areas required for the SWM facility. The twin pond configuration is considered at this time, the more cost effective alternative than the underground storage Option B3 and Option B4.

5.3.7 Stormwater Pond and Proximity to the Windsor International Airport

Throughout the duration of this study, the design and implementation of SWM ponds P1 to P8 were reviewed with the Airport staff to assist with the development of the SWM

pond design as it relates to waterfowl mitigation as these ponds are within the airport's primary and secondary hazard zones. Details regarding the results of that consultation is included in **Section 3.8.5** above.

To supplement the functional design report, natural environment report and recommendations associated with waterfowl mitigation a supplementary guidance document was developed to provide prescriptive design guidance, monitoring recommendations and maintenance of these facilities. The "Supplementary Waterfowl Adaptive Mitigation Plan and Stormwater Management Facilities – Sandwich South Master Servicing Plan" dated April 13, 2023 included in **Appendix F-10**.

This plan has been developed to follow guidelines provided in the 2018 Template for the Development of an Airport Wildlife Management Plan by Transport Canada. The recommended mitigation measures consider four principals of wildlife management:

1. Habitat modification (landscaping, engineering designs);
2. Wildlife exclusion (netting, fencing);
3. Behaviour modification (decoys, falcons/dogs, flags); and
4. Physical removal (capture and release).

It is recommended that the SWM pond wildlife management will be achieved by habitat modification, and through the use of linear, meandering and heavily vegetated ponds. Beyond the design and mitigation plans that are identified for each pond during detailed design, monitoring and maintenance of those elements must be done regularly and throughout the lifetime of these facilities. Over time, as monitoring is completed, modifications to the ponds, landscape and/or implementation of additional mitigations measures listed above will need to be introduced as needed. The provided Adaptive Mitigation Plan is meant to be a framework for the continued operations and maintenance of these facilities.

As summarized above, comparative evaluations of criteria, including safety considerations associated with proximity to the airport, and considering the construction, implementation and maintenance of these facilities, the use of wet ponds has been identified as the preferred solution. The use of dry ponds was also considered through this evaluation. Dry ponds were generally not preferred due to the extent of

upstream quality control infrastructure needed to meet environmental quality standards the extensive maintenance to mitigate runoff quality issues.

The City and Dillon project team have coordinated with Airport extensively to develop a solution that would address risk factors and meet the needs of the airport based on their experience and current wildlife management practices. Development of SWM design alternatives for both the East Pelton and CR42 Secondary Plan area, and the area surrounding the Lauzon Parkway/CR42 intersection, Airport Staff recommended that ponds within the primary hazard zones be implemented as dry ponds that do not have permanent pool that would have a body of water that may increase attractiveness of the ponds to water fowling posing increased safety risks.

Most recently, Airport provided the formal extents of their Primary Hazard Zone Areas which we overlaid on our proposed SWM pond plan, see **Figure A5-4**. Based on this plan, the SWM functional design reflects these recommendations. Most notably, ponds P1 and P3 which are in direct line of the southern approach are recommended to be implemented as dry ponds to aid in the wildlife control plan and in keeping with Transport Canada's Land Use in the Vicinity of Aerodromes - TP 1247 document.

The City has also reviewed these plans with Transport Canada via correspondence in January 2023 and meeting held on January 26, 2023. Minutes of this meeting can be found in Appendix A. Transport Canadas is in support of the hybrid approach and is in support of the implementation of the WAMP. The functional design of the SWM ponds reflect this approach and is further described in **Section 5.7.2** below.

As plans for proposed SWM facilities are brought forward for design and construction the City, Airport and Transport Canada shall be made aware and plans to mitigate hazards shall be finalized for each pond at that time.

5.4 Stormwater Servicing

Stormwater servicing refers to the conveyance system that routes runoff from the source to the stormwater management facility. The conveyance system shall be sized to ensure that surface ponding is limited and under the established level of service. Level of service refers to design storm that is used to size the conveyance system. Based on the regional guidelines, at a minimum, conveyance systems shall be designed using a

1 to 5 year storm such that the hydraulic gradeline of the storm system does not exceed 0.3 m below existing grade.

5.4.1 Identifying Alternative Solutions

Three alternatives were considered for the stormwater servicing strategy summarized in **Table 5-5.**

Table 5-5: Stormwater Servicing Alternatives

Alternative	Description
Option 1	Do Nothing: No area-wide comprehensive storm conveyance system implemented.
Option 2	Traditional Storm Sewer Network: Enclosure of the existing municipal drain system and provision of buried stormwater trunk sewers.
Option 3	Combined Open Drain and Storm Sewer Network: Utilization of existing and new open drains in combination with buried storm sewers.

Figure 5-2 shows a typical construction for infrastructure specified for the above options.

Figure 5-2: Storm Sewer Network (L) and Open Drain (R) Sample Images

Option 2 would utilize the pictured storm sewer network buried infrastructure, and Option 3 would use both types of pictured infrastructure.

5.4.2 Evaluation of Stormwater Servicing Alternatives

The three Stormwater Servicing Alternatives were comparatively evaluated and based on that comparative evaluation Option 2 was found to be preferred.

Option 2 was determined to be the preferred alternative based on the following:

- ✓ Less land area required to accommodate sewers.
- ✓ Low comparative maintenance cost.
- ✓ Due to flat topography, shallow swales may not provide sufficient outlet for private property areas.
- ✓ To provide resiliency to the system, there is opportunity to size the infrastructure to provide a level of service for a 1 to 10-year storm which is greater than the regional stormwater management guidelines.

5.5 Transportation

Additional traffic will be introduced as a result of development within the Sandwich South Study Area. To assess the transportation network, a separate Sandwich South Transportation Network Analysis was completed and included in **Appendix E**.

There are two ways that additional traffic needs can be met:

- **Expand the Network** – This strategy would expand the road network to accommodate the travel demand. This would be accomplished through an emphasis on vehicular movements only, or with an emphasis on sustainable modes in addition to cars such as pedestrian, cycling and transit modes. Given the high level of development in the Study Area and few boundary roads, additional transportation facilities are needed and it will be important to reduce the auto mode share to manage travel demand.
- **Consider Smaller Development** – While bringing fewer people and jobs to Sandwich South could result in less traffic and the highest level of service for vehicle travel, it does not fully accommodate the future population and employment that has been identified for this area.

This transportation analysis is based on the total projected population and employment for the Study Area and the philosophy of expanding the road network with an emphasis

on sustainable modes, including transit and pedestrian modes. Travel demand was estimated through a computational traffic model. The baseline assumptions for this model were informed by mode share recommendations from previously completed background studies (listed in **Section 1.5**) and development plans. Based on the established land use plan (**Figure A1-1**), the resulting development yields from the full built out of the development area is 9165 residential units from low, medium and high density land use areas and almost 26,000 employees for retail, employment and hospital land use areas.

> **Problem/Opportunity:** There is a need to develop a transportation improvement plan that best meets the future needs of the Sandwich South Study Area and provides a variety of transportation facilities for cars, transit, cycling and walking that are accessible for all ages and abilities.

Transportation improvement alternatives to guide the development of a proposed network for Sandwich South were reviewed on 2 levels:

1. Transport Network Servicing Alternatives
   - What roadway and active transportation connections will provide community linkages?
2. Road Corridor Servicing Alternatives
   - What opportunities exist to support the proposed road network?

Previous studies have been undertaken from which a conceptual road network was devised within the Secondary Plan areas. The conceptual road network was reviewed as part of this evaluation.

5.5.1 Identifying Alternative Transportation Solutions (Level 1)

Two options were considered to inform the development of the transportation network plan:

Table 5-6: Transportation Network Alternative Evaluation

Alternative	Description
Option 1: Maintain Conceptual Road Network	Maintaining the conceptual road network devised as part of previous studies. (East Pelton SPA and CRSPA as described and illustrated in **Section 1.5**)

Alternative	Description
Option 2: Modify Conceptual Road Network	Allows for modifications to the conceptual design of the collector road network to allowing for modifications to accommodate findings based on the latest land use and servicing requirements.

Through the evaluation of previous transportation network recommendations, there are a number of localized issues that were identified. Option 2 proposes modifying the road network to address theses issues listed below to propose of a modified collector road network including:

- Separation from the Highway 401 Interchange: New intersections must be at least 200 metres away from ramps onto Highway 401.
- Crossing of Existing Natural Environment Areas: New roadways should not cross natural areas, where possible. At road crossings, natural road crossings or bridges should be considered.
- Connectivity: In the planned network, there is a lack of connectivity between the East Pelton Secondary Plan Area, the County Road 42 Secondary Plan Area and the balance of the Study Area. The plans can be modified to include a collector that traverses the entirety of the Study Area.
- Facilitation of Development: Now that more development specific details are available, some modification to the collector road network can be made to the Secondary Plan road network to reflect comments received from stakeholders.

In either of these options, the Arterial Road network will not change and will remain consistent with the previously completed Lauzon Parkway EA.

5.5.2 Evaluation of Transportation Network Alternatives

Option 1 includes maintaining the conceptual road networks devised as part of previous studies. As the design has progressed for these areas, and noting the issues above, Option 1 would not allow for addressing some of the issues, therefore making it more difficult to travel between destinations within the Study Area, and adjacent areas. This option would therefore make it more difficult to access employment areas and businesses within the Study Area making it less suited to support growth (less efficient network).

Preferred Alternative: Option 1: Maintain Conceptual Road Network

Results of the evaluation and a more detailed evaluation table is included in **Appendix G, Table G-5.**

5.5.2.1 Transportation Network Connections

In addition to the specific issues listed above, the following network planning principles were used to guide the development of a collector road network:

- A well-connected network provides continuous direct routes to destinations, which can be achieved by maximizing the number of connections to arterial roadways (Lauzon Parkway, CR42 and East-West Arterial Road). Based on the traffic distribution and the Study Area's location in the City of Windsor, the general orientation of traffic is to/from the north and west portions of the City, therefore, the major direction is to maximize connections to County Road 22 (CR22), Walker Road and CR42 west of Lauzon Parkway.
- The previous completed Transportation EAs for Lauzon Parkway, CR42, the East-West Arterial Drain, Banwell and CR43 establish the capacity, alignment, and location of key intersections for surrounding arterial roads. This arterial roadway network is set and the collector roads proposed shall fit into the already established road network.
- In general, while considering an urban road network, 400 metre spacing between signalized intersections on arterial roads is ideal to provide the necessary coordination to achieve signal progression.
- Additional connections to the existing arterial road network, by distributing the turning movements among additional intersections, can effectively resolve the problem of excessive intersection turning volumes at congested intersections. These additional connections are derived from extending collector roads both internally and externally, outside of the SSMPS study area. This will help ease operational issues on Lauzon Parkway in particular.
- Additional lanes and roundabouts can also be introduced to certain intersections to increase traffic capacity.

5.5.2.2 Collector Roadway Corridors

Long and direct collector roads that link communities and serve local multi-modal demand is the first priority. This ensures that some internal trips can be served on the collector road network.

According to generally accepted spacing guidelines, Arterial roads should be 2 kilometres apart and collector roads should be 1 kilometre from other collectors and arterials. However, due to the high expected traffic volumes and constraints in the road network, spacing may be less in some locations.

In order to enhance the development of the future urban area, the corridors should be able to provide enough capacity to carry the forecasted traffic volumes while offering the opportunity to extend beyond the Study Area in the future to accommodate future development. In addition, the corridors should include pedestrian and cycling infrastructure to serve active modes of transport and support sustainable development.

Any collector roads added to the plan should extend those that are already included in the East Pelton and County Road 42 Secondary Plans.

5.5.3 Identifying Road Corridor Alternative Solutions

With establishment of a transportation road network, individual opportunities and problems were identified, for which road corridor solutions were evaluated.

Problem/Opportunity

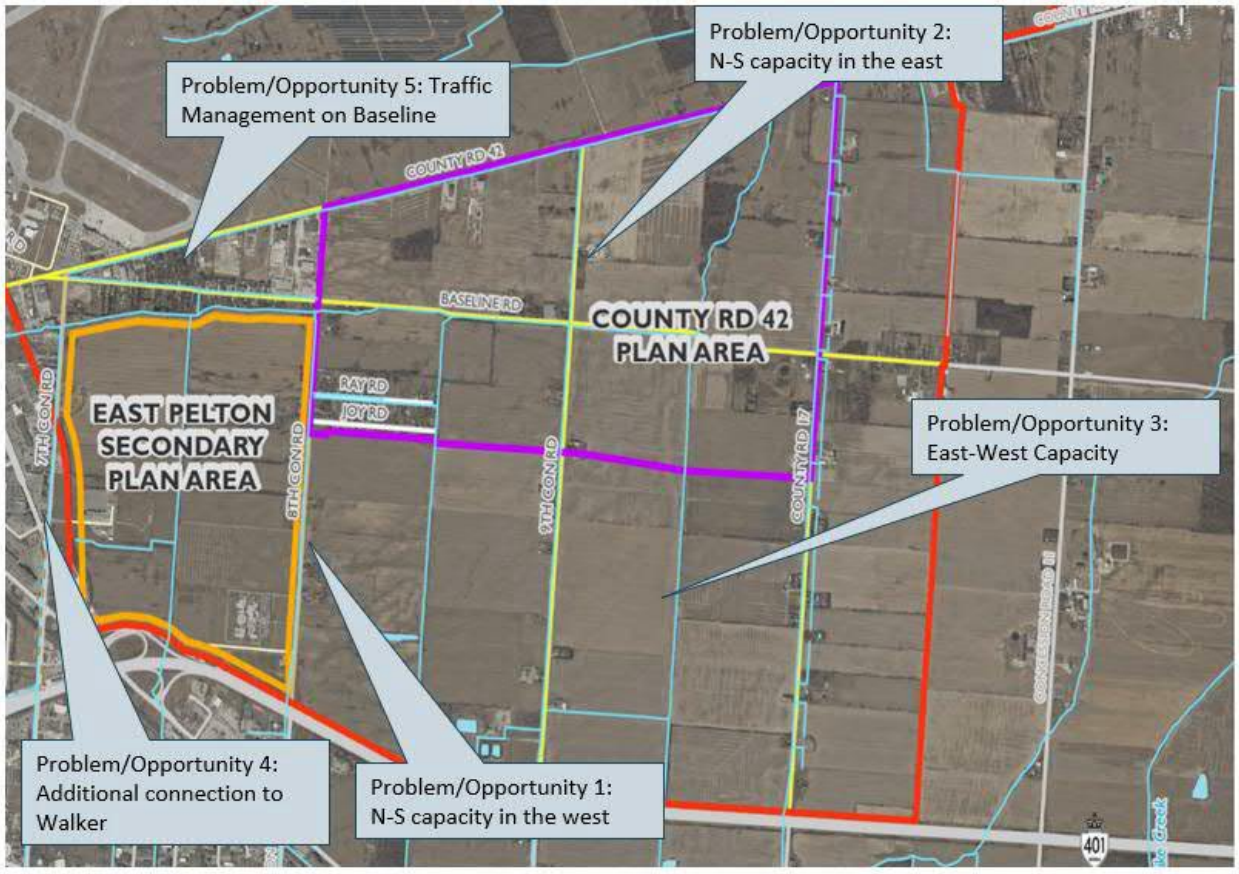
1. North-South Capacity in the West
    - Alternatives solutions considered: Widening of 7th Concession Road or 8th Concession Road to four lanes.
2. North-South Capacity in the East
    - Alternative solutions considered: Widening of 9th Concession Road or 10th Concession Road to four lanes.
3. East-West Collector Alignment
    - Alternative solutions considered: Use Joy Road Right-of-Way, do not build collector between 8th and 9th Concession, curve the alignment of East-West

Collector North to connect with East Pelton collector or curve the alignment south to connect with East Pelton collector.

4. Additional East-West Connection to Walker Road
   - Alternative solutions considered: Do not add a new connection, add an additional East-West connection from 7th Concession Road to Walker Road.
5. Traffic Management on Baseline Road
   - Alternative solutions considered: Traffic management on Baseline Road between 7th Concession and 8th Concession, dead end Baseline Road at 8th Concession Road.

The locations of the problems/opportunities are shown in **Figure 5-3**.

Figure 5-3: Road Corridor Problem/Opportunity Locations



5.5.4 Evaluation of Road Corridor Alternative Solutions

For each problem/opportunity the alternatives were evaluated based on the criteria presented previously. The following summarizes the results of these evaluations. More detailed evaluation tables are included in **Appendix G**, **Tables G-6** through **G-10**.

5.5.4.1 Problem/Opportunity 1: Additional North-South Capacity on 7th Concession Road versus 8th Concession Road

Due to the level of traffic expected on the north-south roads in the Study Area, either 7th Concession Road or 8th Concession Road may need to be widened to four lanes. Widening 8th Concession Road is the preferred alternative because it is more central to the Study Area making it more useful to more residents, employees and visitors. Widening a road that is more centrally located allows for a larger portion of the Sandwich South lands to benefit and makes internal trips within the Study Area easier. Comparatively, 7th Concession Road is less preferred because it is on the periphery of the Study Area and will be right-in/right out at the East-West Arterial, limiting its utility.

Preferred Alternative: Widen 8th Concession Road from 2 lanes to 4 lanes.

5.5.4.2 Problem/Opportunity 2: Additional North-South Capacity on 9th Concession versus 10th Concession

Due to the level of traffic expected on the north-south roads in the Study Area, either 9th Concession Road or 10th Concession Road may need to be widened to four lanes. Both corridors are similar, however 10th Concession Road is planned to be right-in/right-out only at County Road 42 due to its proximity to the Lauzon Parkway intersection. Widening 9th Concession Road provides the most transportation flexibility as it is more central to the Study Area allowing a larger portion of the development area to benefit.

Preliminary Preferred Alternative: Widen 9th Concession from 2 lanes to 4 lanes.

5.5.4.3 Problem/Opportunity 3: East-West Collector Alignment/Joy Road Traffic Management

In order to create a complete road network facilitating travel within the Study Area, several collector roads need to be added to the Study Area. However, there are few opportunities to add a collector that can traverse the entirety of the Study Area. There is an opportunity to add an east-west collector between Baseline Road and the East-West

Arterial that can use the Joy Road right-of-way, curve north to connect with a collector in East Pelton, or curve south to connect with a collector in East Pelton. Due to the narrow right of way on Joy Road and the disruption to existing residents, using the Joy Road right of way is not preferred. Curving the road south is the preferred alternative as it avoids the Joy Road right of way.

Preferred Alternative: Curve south to connect with East Pelton collector.

5.5.4.4 Problem/Opportunity 4: Additional East-West Connection to Walker Road

There are only two connections from the Study Area to Walker Road, on is the existing County Road 42 connection and second is the future East-West Arterial (which is currently the intersection of 7th Concession and Walker Road). The potential to add another connection to Walker Road at 7th Concession Road was explored. From a traffic operations perspective there would be some improvement to the Walker Road / County Road 42 intersection, however the impact would be minimal. In addition, a new connection would require property acquisition and could impact businesses on 7th Concession and Walker Road. Therefore, the benefits of an additional connection to Walker Road are considered minimal compared to the costs. The City will consider ways to provide an active transportation link to provide additional cycling/pedestrian connectivity to Walker Road.

Preferred Alternative: Do not add vehicular connection to Walker Road. Consider opportunities to provide an active transportation link.

5.5.4.5 Problem/Opportunity 5: Baseline Road Traffic Management

There is an existing residential community on Baseline Road between 7th Concession Road and 8th Concession Road. With the future development of Sandwich South, traffic volumes on this corridor are likely to increase, disrupting existing residents. A dead-end on Baseline Road at 8th Concession Road would solve this problem; however, it introduces emergency access issues due to the length of the cul-de-sac that would be created. Therefore, the preferred option is to institute traffic calming measures that will lower the amount of traffic travelling on this corridor, while still allowing access for emergency vehicles and some vehicle traffic.

Preferred Alternative: Institute traffic calming measures.

5.6 Preferred Solutions

The following list the preferred alternatives for servicing the Sandwich South Study Area:

Stormwater Management Services

- Eight stormwater management ponds, with a linear, narrow permanent pool of water to capture surface flooding and provide quality control including water flow mitigation measures.
    - Subsequent to the evaluation of alternatives, in response to comments received a hybrid stormwater servicing solution was developed and reflected in the recommended design.

Lauzon Parkway and County 42 Intersection

- Two ponds to serve the construction of the Lauzon Parkway/CR42 intersection and service the future development lands fronting CR42.

Stormwater Servicing

- A traditional enclosed storm sewer network comprised of trunk storm sewers draining upstream drawings areas via private drain connections and roadway drainage catchbasins.

Transportation Network

- Adoption of a conceptual road network modified from that presented in previous studies;
- Widening of 8th Concession Road from 2 lanes to 4 lanes;
- Widening of 9th Concession Road from 2 lanes to 4 lanes;
- Development of an east-west collector traversing the full Study Area south of Joy Road south to connect with the East Pelton collector;
- No additional vehicular connection to Walker Road but consideration of an active transportation connection; and
- Traffic calming measures on Baseline Road between 7th Concession and 8th Concession Road.

Subject to comments received during consultation on the draft Master Plan, the above list of preferred alternatives will become the servicing plan for Sandwich South.

Table 5-7 to **Table 5-10** below summarizes the individual municipal servicing projects included in the servicing plan. As noted in **Section 2.1**, there have been recent changes to the Municipal Class EA, the list below is reflective of these new project designation changes. The tables also highlight the MECA schedule (from MCEA Table A) for each of the individual projects. As noted in **Section 3.2**, there are three schedules of projects each with different Class EA requirements as follows:

- Projects noted as 'Exempt' projects require no further study and can proceed directly to implementation/construction.
- Projects noted as Schedule B projects have completed the MCEA requirements through this MP and subject to comments received during the review of this MP can proceed directly to implementation/construction.
- Projects noted as Schedule C projects have completed phases 1 and 2 of the MCEA process. Using the work in the MP as a base, Phases 3 & 4 of the MCEA process must be completed prior to implementation/construction.

Table 5-7: Project List – Stormwater Management Facilities

Project	Project Description	Class EA Schedule
East Pelton Secondary Plan Area		
P1 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a dry receiving pond (P1), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B
P2 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a wet receiving pond (P2), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B
County Road 42 Secondary Plan Area		
P3 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a dry receiving pond (P3), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B
P4 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a wet receiving pond (P4), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B

Project	Project Description	Class EA Schedule
P5 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a wet receiving pond (P5), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B
P6 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a wet receiving pond (P6), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B
P7 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a wet receiving pond (P7), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B
P8 SWM Pond, Pumping Station and Outlet to Municipal Drain	Construct a wet receiving pond (P8), landscaping and maintenance pathway. Construct a pumping station, a pond outlet, and a stand-by power generator.	B

Table 5-8: Project List – Stormwater Servicing

Project	Project Description	Class EA Schedule
East Pelton Secondary Plan Area		
P1 Storm Sewer (7th Concession Road)	Install stormwater sewers along 7th Concession Road to Pond 1 (outlet 1).	Exempt
P1 Storm Sewer (Road C1)	Install stormwater sewers along C1 Road to Pond 1 (outlet 2).	Exempt
P1 Storm Sewer (Road C2)	Install stormwater sewers along C2 Road to Pond 1 (outlet 3).	Exempt
PS2 Trunk Storm Sewer (C1 Road)	Install stormwater sewers along C1 Road to Pond 2 (outlet 1).	Exempt
County Road 42 Secondary Plan Area		
P3 Trunk Storm Sewer (8th Concession Road)	Install stormwater sewers along 8th Concession Road from East-West Arterial Road to Pond 3 (outlet 1).	Exempt
P3 Trunk Storm Sewer (9th Concession Road)	Install stormwater sewers along 9th Concession Road from East-West Arterial Road to Pond 3 (outlet 3).	Exempt

Project	Project Description	Class EA Schedule
P3 Trunk Storm Sewer (Road C5)	Install stormwater sewers along C5 road from East-West Arterial Road to Pond 3 (outlet 2).	Exempt
P3 Trunk Storm Sewer (Road C7)	Install stormwater sewers along C7 Road from East-West Arterial Road to Pond 3 (outlet 4).	Exempt
P4 Storm Sewer County Road 42 - Phase A	Install stormwater sewers along Baseline Road from 8th Concession Road to Pond 4 (outlet 1).	Exempt
P4 Storm Sewer County Road 42 - Phase B	Install stormwater sewers along C6 Road from C5 Road to Pond 4 (outlet 2).	Exempt
P5 Storm Sewers (C8 Road- C6 Road)	Install stormwater sewers along C6 Road and C8 Road from C8 Road to Pond 5 (outlet 1).	Exempt
P6 Storm Sewers (Lauzon Parkway)	Install stormwater sewers along Future Lauzon Parkway from East-West Arterial Road to Pond 6 (outlet 1).	Exempt
P7 Trunk Storm Sewer - CR42	Install storm sewers along Lauzon Parkway to Pond 7 (Outlet 1).	Exempt
P8 Trunk Storm Sewer - CR42	Construct 250 m of storm sewers routing from the NE corner of Hospital Site to P8 Pond.	Exempt
P8 Trunk Storm Sewer - Lauzon Parkway	Construct 300 m of storm sewers within the Lauzon Parkway/CR42 Intersection construction Phase Limits. Remaining roadway drainage shall be provided via open drainage ditch along the west side of Lauzon Parkway.	Exempt

Table 5-9: Project List – Transportation Network

Project Title	Project Description	Class EA Schedule
7th Concession Road - County Road 42 to East-West Arterial Road	Reconstruct a two-lane road along 7th Concession Corridor from County Road 42 to the Future E-W Arterial Road.	Exempt
8th Concession Road - County Road 42 to East-West Arterial Road	Widening 8th Concession Corridor from two lanes road to four lanes from CR 42 to the East West Arterial Roadway.	C

Project Title	Project Description	Class EA Schedule
9th Concession Road -Baseline Road to East-West Arterial Road	Widening 9th Concession Corridor from two lanes road to four lanes from CR 42 to the East West Arterial Roadway. The road segment is from CR42 to East West Arterial Roadway.	C
10th Concession Road - County Road 42 to East-West Arterial Road	Reconstruct 10th Concession Road from County Road 42 to C4.	Exempt
Baseline Road – CR 42 to east CR42 SPA boundary.	Traffic calming and road Improvements along Baseline Road from 7th Concession to 8th Concession Road.	C
C1 Road (Phase A) - C3 Road to East-West Arterial Road.	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C or Draft Plan of Subdivision
C2 Road - C3 Road to East-West Arterial Road	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C
C3 Road - 7th Concession Road to 8th Concession Road.	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C
C4 Road (Phase A) - 7th Concession Road to the east CR42 SPA boundary.	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C
C5 Road (Phase B) – CR42 to East-West Arterial Road	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C
C6 Road (Phase B) - 10th Concession Road to Lauzon Parkway	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C
C7 Road (Phase B) – CR42 to East-West Arterial Road	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C

Project Title	Project Description	Class EA Schedule
C8 Road - 10th Concession Road to Baseline Road	Construct a new two lane road including pedestrian facilities, lighting, drainage and utilities.	C

In addition to the projects listed above, a number of sanitary trunk sewer projects have been identified as projects in the SS Sanitary EA (2014). These projects are listed below as the implementation of these projects are critical to the municipal serving needs.

Table 5-10: Project List – Sanitary Servicing

Project Title	Project Description	Class EA Schedule
9th Concession Trunk Sanitary Sewer	Install sanitary sewers along 9th Concession Road between CR42 and the south boundary of the CR42 SPA. Discharging to the CR42 trunk sanitary sewer.	Exempt
10th Concession Trunk Sanitary Sewer	Install sanitary sewers along 10th Concession Road between CR42 and the south boundary of the CR42 SPA. Discharging to the CR42 trunk sanitary sewer.	Exempt
Little River Pollution Control Plant (LRPCP)	Upgrade the treatment plant to provide additional treatment capacity to accommodate additional drainage areas.	Schedule C (Separate Study)

5.7 Recommended Solutions

The preferred servicing solutions outlined above were further refined based on comments received and functional design. The functional design of the municipal infrastructure has been completed to confirm layout, size, location and functionality of the proposed infrastructure. The design criteria, assumption and design information are detailed in **Appendix F**, "Sandwich South Municipal Infrastructure Functional Design Report" (Functional Design Report) and discussed in the following sections.

5.7.1 Sanitary Trunk Sewer Functional Design

The functional design of the trunk sanitary sewer system was largely based on the design completed and presented in the 2014 SS Sanitary EA. Upstream segments along Lauzon Parkway, CR42 and 8th Concession Road of the sanitary trunk sewer have been

constructed previously. The sanitary trunk sewer design sheets that have been included in Appendix F reflect the as-built depth and size of those sewers. Since 2014, the secondary plans for East Pelton, and the CR42 SPAs have been refined, and based on the refined land uses and population densities, the sanitary trunk sewer system design was re-evaluated. Also, design criteria used to design the previous sanitary trunk system was reviewed to ensure that parameters reflect the latest design standards. Based on this evaluation, the sizes of the sewers along 9th Concession Road and 10th Concession Road have been revised to better reflect the expected sewage generation and infiltration allowances.

Sanitary sewers will be constructed within the City's existing right-of-way limits, based on the sizes and depths shown in **Figures A5-0**. Refer to the Functional Design report in **Appendix F** for more details on the sanitary sewers design including the design guidance and parameters for the design of the internal sanitary sewers required to serve the development.

5.7.1.1 Connection to New Sanitary Sewers

Based on the Municipal Act, 2001, where new sanitary sewers are constructed, any existing development abutting the sanitary sewers will be assessed for the cost of the sewer per the City's Local Improvement Policy. Property owners shall be assessed fees for the construction of the sewer based on the length of property frontage. In advance of any sanitary sewer improvements, affected property owners will be notified of those works and the estimated assessment cost.

5.7.1.2 Assessment of the Little River Pollution Control Plant Capacity

A high-level review of available treatment capacity at the Little River Pollution Control Plant (LRPCP) has been completed. As part of the Appendix F: Municipal Servicing Functional Design Report memo entitled, "Sandwich South Master Servicing Plan Little River Pollution Control Plant (LRPCP) – Capacity Assessment", summarizes the findings related to the capacity of the LRPCP as it pertains to the level of development that can be accommodated prior to the City completing a Schedule C Environmental Assessment for the expansion of the plant.

The assessment of treatment plant capacity has confirmed that in order to accommodate build-out of the SSMSP area that the LRPCP plant will need to be

expanded. There are a number of factors that contribute to the timing associated with treatment plant expansion, and new population is only one element that needs to be assessed in refining the timeline. It is recommended that the City initiate a Schedule C study that considers the following:

- Incorporate sewage flow estimated from this development area;
- Measures to manage wet weather inflow and infiltration as recommended in the Sewer and Coastal Flood Protection Mater Plan (2020);
- Identifies current influent quality and determines future influent quality and treatment needs;
- Estimates additional sewage flow from infill of existing development areas; and
- Includes coordination with the Town of Tecumseh to accommodate external treatment needs.

An equivalent of 6,000 persons can be accommodated before the total treatment plant capacity reaches 70% in either the Windsor or Tecumseh development areas. The City shall monitor population growth and estimate how flows will affect the inflow capacity of the treatment plant. Beyond considerations for population growth, risks associated with wet weather storm events and inflow and infiltration management shall also continue to be top priority.

5.7.2 Stormwater Management Pond and Pumping Station Functional Design

The stormwater management strategy to service the SSMSP area has been initially developed through the completion of the ULRMP (2022) and reviewed and evaluated as part of this Master Plan. Based on the alternative evaluation, the use of a series of regional stormwater management ponds with pumped storm sewer outlets to existing drains would be required to service development. Stormwater drainage areas where delineated based on the drainage areas identified in the ULRMP and refined based on the proposed land use plan and established road network.

Based on the feedback received from the Windsor Airport and Transport Canada, the use of a hybrid SWM facility strategy is recommended. **Figure A5-3** provides an overview map of the SWM strategy with further detail on the storm sewers and pond layout in **Figures A5-5** to **A5-7**.

The SWM strategy includes the proposed layout of the stormwater management corridors that include the proposed SWM ponds, pumping stations, municipal drains, natural environment areas and maintenance/recreational corridors. Each pond depth has been established based on a number of engineering design criteria which includes:

- Excavation volume sufficient to store the runoff volumes for a 1 to 100 year storm event that will be conveyed to the pond via the minor (storm sewers) and major (overland) systems.
- The permanent pool elevation (wet ponds) or pond bottom (dry ponds) must correlate with the trunk storm sewer that are proposed to serve the proposed development areas.
- Proposed finished grade elevations around the ponds have been establish to ensure that overland flows from the development areas drain over the banks and into the ponds.

Typical cross sections of the proposed SWM ponds in **Figures A5-8** and **A5-9** show the relative depth of the proposed ponds and the orientation of the corridor. Cross sections for each pond can be referenced in **Appendix F** Functional Design Report.

Figure 5-4: Typical Schematic of a Proposed Stormwater Management Pond

5.7.3 Storm Trunk Sewer Functional Design (Minor Drainage System)

Based on the preferred option to service development areas with conventional storm sewer systems, the functional design of the trunk storm sewer networks was completed based on the land use and proposed road network.

Storm sewer infrastructure shall be designed to meet minimum standards laid out in the SWM Guidelines. This area is relatively undeveloped and therefore uniquely. The proposed servicing plan may be designed to consider providing flexibility to accommodate drainage pattern changes due to climate change and or changes to development patterns that may occur over time.

The City is committed to implement a sustainable system that also mitigates risks associated with flooding. To do this, the City will mandate that all trunk storm sewers shall be designed to a 1 in 10 year storm return period, where water within the system remains below ground (lower than 0.3 m below finished grade). Local sewers may be designed to meet the minimum storm guidelines which require sewer water levels to be 0.3 m below grade for a 1 to 5 year storm.

5.7.4 Overland Flow Functional Design (Major Drainage System)

For storm events greater than the 1 in 10 and 1 in 5 year storm events, runoff collected will be stored on the surface until the system can drain to the downstream pond through the minor system. Proposed right-of-way grading shall be set to ensure that surface storage shall not exceed 0.3 m depth for storm events up to the 1 to 100 year storm event. For major storm events that are greater than the 1 to 100 year storm event, runoff will need to be directed overland to the assigned SWM Pond. To achieve this, minimum finished grades must be maintained. Refer to **Appendix F** – Functional Design report for suggested grading plan. Proposed grades also consider the Regulatory flood elevations minimum finished grades that are required to reduce risk of flooding based on the LRRFP.

Wherever possible, consider impacts on surrounding areas, arterial and collector roadways should be designed with one dry lane for the 100-year storm event.

5.7.5 Collector Road Right-of-Way Design

The transportation system framework is made up of arterial and collector roadways. The functional design and alignment of the arterial roadways including Lauzon Parkway, CR42 and the proposed East-West Arterial Road are included in the Lauzon Parkway EA (2014). Based on the recommended collector road network to support internal network development has been detailed in **Appendix E**.

Sequent to the evaluation of alternatives described in Section 5.5.4, the analysis approach taken to estimate the future traffic demands and movements was modified to better estimate the transportation needs for future conditions. A revised analysis strategy was used to provide a better representation of proposed traffic conditions and therefore the analysis was updated accordingly. Based on this analysis, it was found that maintaining two lanes along all four existing north-south corridors (7th, 8th, 9th and 10th Concessions) would be sufficient to meet the ultimate condition demands. As development proceeds, traffic shall be monitored and based on observed traffic conditions the need to implement additional lanes shall be evaluated. It is recommended that all necessary 26.0 m right-of-way corridor widths, for all collector roadways, be reserved to accommodate the vehicular lanes, active transportation facilities and other elements such as streetlighting, trees and municipal servicing corridors.

As noted in **Section 5.5** above, alternative solutions to accommodate the full build-out of the Study Area were evaluated. **Table 5-11** summarizes the road design corridors included in the recommended transportation network design. **Figure A5-11** depicts the proposed road network layout.

Table 5-11: Collector Roadway Recommended Design

Roadway	Proposed Configuration	Active Transportation Facilities
7th Concession	Urban, 2 Lane Road	Sidewalk-Both Sides of roadway On-street Bike Lanes or On-Way Cycle Track.
8th Concession	Urban, 2 Lane Road	Sidewalk-Both Sides of roadway On-street Bike Lanes or On-Way Cycle Track.

Roadway	Proposed Configuration	Active Transportation Facilities
9th Concession	Urban, 2 Lane Road	Sidewalk-Both Sides of roadway On-street Bike Lanes or On-Way Cycle Track.
10th Concession	Urban, 2 Lane Road	Sidewalk-Both Sides of roadway On-street Bike Lanes or On-Way Cycle Track.
Baseline Road	Urban, 2 Lane Road Traffic Calming Measures between CR42 and 8th Concession Road Intersection.	Sidewalk-Both Sides of roadway On-street Bike Lanes or On-Way Cycle Track.
Internal Collector Roads	Urban, 2 Lane Road	Sidewalk-Both Sides of roadway On-street Bike Lanes or On-Way Cycle Track.
Local Roads	Urban, 2 Lane Road	Sidewalk-Both Sides of roadway

Improvements to upgrade existing rural roads to urban roads shall be completed as development occurs to support the development and to provide the necessary active transportation and transit facilities that will be needed.

Road improvements proposed include the reconstruction of the existing roadways to curbed roads, with stormwater drainage, signalized intersections, turn lanes, transit needs and potentially parking. Estimated costs for reconstruction projects are estimated to be greater than $3.0 million, which is greater than the MCEA's listed threshold for designating a project as a Schedule C project (Refer to the 2023 MCEA EA Table 4: Municipal Road Projects, Item 33). Schedule C EA(s) may also be required prior to implementation of new collector roadways. The 2023 MCEA EA planning process outlines a Collector Road Screening Process (Section 1.3) that assists with determining if the City as the proposed must proceed with an applicable Schedule C project. The City shall consider the completion a Schedule C EA to established the road design and forecast the timing required for the proposed works. In addition, the City shall monitor the traffic demand in the areas and as the vehicle traffic approaches the peak demand the City shall ensure that Schedule C is complete and budgetary funds are available. As development proposals come forward, each developer shall prepare a Transportation Impact Assessment to assist the City in determining when future improvements are required.

Typical collector road cross sections, noting the lane configuration, are shown in **Figures A5-12 to A5-18**. The functional design report in **Appendix F** describes the parameters and sources of design criteria used to establish the road cross sections. In addition to the 2 or 4 lanes required to support the proposed buildout, facilities will be required to accommodate active transportation, public transit and parking.

5.7.6 Future Municipal Infrastructure Detailed Design

During detailed design of the functional design solutions outlined within this study, it is recommended that the following design considerations be included:

- All applicable storm system improvement projects within the Little River watersheds shall follow the minimum ERCA Regulatory minimum Floodplain Projection Elevations. Prior to detailed design, outlet conditions and capacity shall be confirmed. Stormwater management solutions may require mitigation measures required to confirm solutions do not have downstream impacts to these existing watercourses;
- Site specific Traffic Impact Assessments must be completed to confirm current traffic volumes and identify design measures necessary to accommodate development along proposed and existing roadways;
- Excess soil characterisation testing and reporting shall be completed to fulfill the requirements of O. Reg. 406/19: On-Site and Excess Soil Management;
- Detailed site-specific geotechnical assessments are completed to confirm the soil conditions;
- Erosion and sediment control plans;
- Noise Impact Studies related to the pumping station and back-up power generators;
- Storm water management plan during construction of in-water works at pumping station outfalls;
- Further archaeological investigation, as required, for submission to the Ministry of Tourism, Culture and Sport (MTCS);
- Additional natural environment investigations, if required in support of permits/approvals from MECP;
- Obtain permits from appropriate agencies as required; and

- Use of Low Impact Development techniques, where possible, as best practices to manage stormwater in addition to the proposed stormwater management strategy developed thorough this study.

5.7.7 Integrated Environmental and Stormwater Management/Open Space System

Land Use planning policies for the City define an integrated system which combines components of the natural environment as well as municipal infrastructure. The Integrated Environmental and Stormwater Management (SWM)/Open Space System for the Study Area was developed by reviewing the policies produced to define the Greenway System for the City of Windsor Official Plan (2013) and County Road 42 Secondary Plan.

As detailed in the Sandwich South Natural Heritage Characterization Report (**Appendix B**), the Integrated Environmental and Stormwater Management/Open Space System is to consist of the following three Components:

1. The Environmental System
2. The Stormwater Management/Open Space System
3. Ecological Linkages

Each of these components are summarized below and in **Section 6.0** of **Appendix B**.

5.7.7.1 Environmental System

In carrying forward policies from the City's OP (2013) and County Road 42 Secondary Plan Area, the Environmental System proposed for the Study Area will consist of:

- Core Natural Heritage Areas; and
- Potential Restoration and Enhancement Areas.

Core Natural Heritage Areas

Core Natural Heritage Areas proposed for the Environmental System are presented in **Figure A4-4**. In accordance with the CR42 SPA (Schedule D: Core Natural Heritage), and under Schedule B of the City's OP (2013), the following Core Natural Heritage areas are to be carried forward and protected long-term within the Environmental System:

- Upper Little River Corridor;

- Windsor Airport Swamps (CNHS #39);
- Sundrop Bend Woodlands (CNHS #40); and
- Fairbairn Woodlands (CNHS #41).

Restoration and Enhancement Areas

Restoration and enhancement opportunities are identified as lands that contribute to the Environmental System by providing supporting functions and opportunities for protection, restoration, and connections, resulting in an overall improvement to the natural heritage features. Enhancement and restoration through management and/or restoration will benefit the Environmental System through increased habitat diversity and improved ecosystem function. Enhancement opportunities are in addition to the areas improved through buffers.

Opportunities for enhancement and restoration were identified within the existing Core Natural Heritage Areas. Specifically, **Figure A4-4** recommends restoration sites in key locations, primarily within vegetation communities of the Sundrop Bend Woodlands (CNHS #40) and Little River riparian habitat. The intent to restore these areas is to reinforce existing functions such as forest interior and habitat connectivity, to diversify vegetation community cover, and provide successional stages using native plant materials and species, and to reduce edge effects.

Additional restoration and enhancements are proposed within smaller isolated woodlands not meeting significance associated with the remaining CNHS areas (KOA Camp, CNHS #42; Ireland Wood Farms, CNHS #43; Wagon Wheel Woods, CNHS #44; and Baseline Woodlands, CNHS #45; **Figure A4-4**). The significance of these woodlands may be re-assessed during additional studies conducted to support individual applications of landowners within the Study Area. At this time, the restoration and enhancement of these features should be considered by landowners.

5.7.7.2 Stormwater Management/Open Space Corridor

The role of the SWM/Open Space System is to attenuate and direct flow from urbanized land uses to ensure safe communities, as well as to provide a trail network for use by the public, respectively. Although SWM infrastructure is not considered wildlife habitat, naturalized landscaped plantings included in pond and municipal drain designs do provide supplemental cover and serve a linkage function. The design and orientation of

SWM infrastructure adjacent to existing municipal drains and natural heritage features could improve the available ecological linkages within the larger landscape of the Study Area.

The design elements of the proposed SWM infrastructure are to:

- Create continuity between existing Core Natural Heritage areas and parks for the movement of wildlife and people;
- Where the linkages cross existing or proposed municipal right-of-ways (i.e. Roadways) provisions for habitat crossings shall be implemented. These crossings shall be integrated into the culverts and bridges that are required for the conveyance of stormwater via drains and ponds.
- Modification of the existing drainage network through the modification and abandonment of some drains. Flow should be concentrated in wider channels with riparian vegetation to enhance fish habitat;
- Due to the close proximity to the Airport, SWM ponds should be designed to discourage use by waterfowl to reduce the likelihood of bird strikes; and
- Increase the base-flow of Little River to enhance fish habitat.

5.7.7.3 Ecological Linkages

Within the proposed Environmental System there are two types of linkages identified:

- Principle linkages – are designed to act as the primary movement corridors for wildlife; and
- Passive Linkages – are generally open areas or parklands that will allow for wildlife movement but that is not their primary function.

The Little River is an existing principle ecological linkage within the Study Area because it is surrounded by variable levels of naturalized riparian vegetation and cover, thereby providing connectivity from the Windsor Airport Woodlands (CNHS #39) to the Sundrop Bend Woodlands (CNHS #40) to the south. In addition, the 6th Concession Drain and proposed East-West Arterial Drain are considered principal ecological linkages as they will provide direct connections to the Little River Drain and a contiguous terrestrial and aquatic connection within the Study Area as a result of the proposed Stormwater Management/Open Space system (**Figure A4-4**). While municipal drains will be subject

to regular maintenance, vegetation plantings along the banks of the drain, are proposed to provide cover supportive of terrestrial wildlife movement. In addition, surface flow collected by the municipal drain will provide a conduit for reptile, amphibian and fish movement.

Open space areas, identified as parkland, are not intended to provide direct habitat for wildlife movement, however will provide passive linkages to existing Core Natural heritage Areas in the Study Area. Parkland connections are proposed to link the Fairbairn Woodlands (CNHS 41) to the Little River corridor in the east, as well as to the 6th Concession Drain and SWM corridor to the south in the current Land Use Plan. Additional parkland connections are proposed to provide a north-south connection to the two SWM corridors associated with the 6th Concession Drain and future East-West Arterial drain to supplement the Little River principal ecological linkage (**Figure A4-4**).

6.0 Implementation Considerations

6.1 Effects and Mitigation

Overall implementation of the recommended infrastructure will result in effects and impacts on existing conditions. Implementation of the new municipal services will involve construction which, depending on the location and nature of the works, will result in permanent changes to existing conditions and will pose temporary construction impacts. Many of these projects are also proposed within future servicing corridors requiring property acquisition and alteration of existing lands.

The City of Windsor is committed to implementing mitigation plans, where appropriate and practical, in order to reduce negative effects associated with the recommended solutions. The following sections highlight the potential effects that could occur as a result of implementing the suite of recommended solutions, and the mitigation that is proposed. It is noted that recommended improvements identified as Schedule C projects will undergo further study and additional potential effects and proposed mitigation may be identified.

An environmental monitoring program will be established with the following objectives in mind:

- To assess water quality prior to discharge to the municipal drains or flood control facilities;
- To provide an early indication of any potential impairment or adverse effects on the on-site and off-site environments; and,
- To trigger and monitor the implementation of contingency measures as required.

6.1.1 Potential Natural Environment Impacts and Proposed Mitigation

All municipal servicing projects identified in this study will require the clearing of lands and subsurface disturbance. These improvements will pose temporary construction impacts to the immediate and surrounding areas. Some of these improvements are within existing municipal right-of-way corridors however many of these improvements are within existing private property areas and while there could be temporary construction impacts, permanent displacement of natural features may be required. The

SSMSP Natural Heritage Characterization report included in Appendix B provides additional details on impacts including recommendations regarding mitigation measures.

Direct impacts are those that are immediately evident as a result of municipal infrastructure improvements. Typically, the adverse effects of direct impacts are most evident during the site preparation and construction phase of a development. Potential impacts of the proposed development include the following:

- Tree and vegetation removal;
- Diversion of surface water flows;
- Erosion and sedimentation into natural features;
- Loss of/disturbance to wildlife and general wildlife habitat;
- Removal of structure containing potential habitat for SAR;
- Realignment or redirection of municipal drains or watercourses.

These impacts are summarized further in **Table 6-1** below.

Table 6-1: Natural Environment Impacts and Mitigation Summary

Category	Impact	Mitigation and Opportunities for Enhancement
Tree and Vegetation Removal	The proposed development will require tree and ground vegetation removal, in order to facilitate grading and construction of the development. Tree removal will result in a reduction of tree cover, general wildlife habitat loss, and alteration of soil conditions.	• Provide Natural Heritage Feature Buffers Areas and limit development and new infrastructure to outside of those buffer areas. • A Landscaping and Planting Plan is recommended for the proposed development to protect or off-set vegetation removal and propose enhancements to natural areas where possible.

Category	Impact	Mitigation and Opportunities for Enhancement
Diversion of Surface Water Flows	• Increased imperviousness affects the watershed's capacity to infiltrate precipitation and detain run off. • Potential changes to stream flow regime and water quality.	Municipal drains will continue to convey runoff from the SSMPS area to the Little River. SWM facilities are proposed to attenuate flows and provide quality control of runoff prior to discharge to those municipal drains.
Erosion and Sedimentation of Natural Features	• Construction of infrastructure has the potential for reduced water quality and degradation of downstream aquatic habitat (e.g., surface water flow into the municipal drain, wetlands or watercourses); and • Disturbance to or loss of additional vegetation due to the deposition of dust and/or overland mobilization of soil.	An Environmental Monitoring Plan (EMP) shall be prepared and followed throughout the duration of construction activities on-site to ensure that the erosion and sediment control measures operate effectively and to monitor the potential impact.

Category	Impact	Mitigation and Opportunities for Enhancement
Loss of and/or Disturbance to Significant Wildlife Habitat, General Wildlife, and Potential SAR habitat	Habitat for flora and fauna may be impacted due to vegetation clearing within hedgerows and riparian vegetation along municipal drains throughout the proposed development area.	• Little River, 6th Concession Drain, and proposed East-West Arterial Drain are considered principal ecological linkages as they will provide direct connections and a contiguous terrestrial and aquatic connection within the proposed Integrated Environmental and Stormwater Management/Open Space system. • Passive linkages are proposed to link woodlands to the integrated Environmental/Stormwater Management/Open Space system. • These linkages will accommodate the passage of wildlife through implementation of habitat crossings at new roadways, throughout the Environmental System. • Habitat protection measures shall be implemented during construction such as refuelling away from watercourses, completing in water work within the fisheries and breeding bird windows.

Category	Impact	Mitigation and Opportunities for Enhancement
Realignment and impacts to Municipal Drains and Watercourses	Municipal drains provide fish habitat and aquatic ecological linkages. Construction within or around watercourses has potential to impact on aquatic habitat.	• "Self-Assessment" will need to be submitted to Fisheries and Oceans Canada (DFO) for individual project locations • SWM best practices should be employed that include measures to mitigate increases in water temperatures, maintaining base flows in receiving streams, reducing the amount of suspended solids and nutrients within the water column and isolating pollutants (e.g., petro carbons and pesticides) for further treatment or removal. • Proposed realignments or redevelopment of these aquatic features (drains) shall maintain the existing form and function to protect this fish habitat. • Adhere to in-water timing windows for construction, site isolation and erosion and sediment controls.

Further studies would be required prior to the detailed design phase to determine if the environmental conditions have changed and/or if elements noted above continue to be present in the landscape. Should their presence be confirmed, additional mitigation and compensation may be required to accommodate this habitat in the landscape on individual properties within the Study Area.

6.1.2 Potential Socio-Cultural Environment Impacts and Proposed Mitigation

6.1.2.1 Cultural Heritage Resources

All alternatives have the potential to impact built heritage resources, cultural heritage landscapes, archaeological sites, or an area of archaeological potential and may require further technical heritage studies by qualified persons and/or consultation with interested persons.

Should Project activities require demolition or removal (in its entirety or partial) of any identified (known or potential) built heritage resource/cultural heritage landscape, a heritage impact assessment shall be undertaken by a qualified person in consultation with the City of Windsor heritage planner. All technical cultural heritage studies should be undertaken as early as possible during detailed design and prior to any final design being endorsed.

6.1.2.2 Archaeology

Sandwich South Master Servicing Plan - Supplementary Stage 1 Archaeological Assessment

Stage 2 archaeological assessments are required for portions of the Study Area prior to any proposed impacts.

Specific portions of the Study Area including existing roadways (Pillette Road), commercial and residential buildings and associated driveways/laneways, as well as the Windsor International Airport, its buildings and runways are considered to be disturbed, therefore, no further work is recommended in these portions of the Study Area.

A Stage 2 archaeological assessment shall be conducted, applying the field methods described in the Archaeological Report in **Appendix C** of this report. The assessment will include a shovel test-pit survey at 5 metre intervals, and a pedestrian survey of the agricultural fields at a maximum of 5 metre intervals.

Should deeply buried archaeological deposits be found during construction activities, the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) must be notified immediately [archaeology@ontario.ca].

Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the area.

East Pelton Secondary Plan – Supplementary Stage 1 Archaeological Assessment

CRM Group was retained by Dillon on behalf of the City of Windsor to undertake a Stage 1 Archaeological Assessment of the East Pelton Secondary Plan Study Area, a proposed residential, commercial, and institutional development, as part of the preparation of the Sandwich South Master Servicing Report.

As a result of the Stage 1 Archaeological Assessment, CRM Group offers the following recommendations.

CRM Group's 2019 Stage 1 Archaeological Assessment and previous assessments conducted by New Directions determined that previously unassessed portions of the Study Area exhibit a moderate to high potential for the identification and recovery of both Pre-contact Indigenous and historic Euro-Canadian archaeological resources. As such, a Stage 2 archaeological assessment is required for most of the East Pelton Study Area prior to any proposed infrastructure construction.

Specific portions of the Study Area including the excavator disturbed area, the Windsor Christian Fellowship property, the Southwest Detention Centre footprint, the residential buildings and swimming pools, the Highway 401 alignment, and 8th Concession ROW on the east side of 8th Concession Road are considered disturbed; therefore, no further archaeological assessment is recommended in these portions of the Study Area.

The Fairbairn Union Cemetery is located outside of the northeast corner of the Study Area. Although the area within the boundary of the cemetery is ascribed high potential for burials, it has been determined that the historic cemetery boundaries do not deviate outside of the boundaries of the contemporary cemetery. Therefore, the portion of the Study Area adjacent to the cemetery is ascribed low potential for burials.

The Stage 2 Archaeological Assessment will include a shovel test-pit survey at 5-metre intervals within areas of manicured lawn, and a pedestrian survey of the agricultural fields at a maximum of 5-metre intervals.

Should the proposed work extend beyond the current Study Area, further Stage 1 Archaeological Assessment should be conducted to determine the archaeological potential of the area.

6.1.2.3 Residents & Community

This servicing plan anticipates the need to support development needs within the Sandwich South Study Area. The need for municipal infrastructure is directly related to the level of development that is expected in and around the Study Area. There will be instances where, to implement these solutions, local residents and business owners will experience impacts. Currently the land is relatively vacant with small pockets of development, and it is anticipated that propose infrastructure will be implemented over several years. Below is a summary of potential impacts that could arise. It is however anticipated, that despite the temporary impacts, the development and urbanization of this area will have an overall benefit to the local economy and support the need to provide housing and development spaces for city expansion.

Temporary disruption impacts associated with construction such as noise, dust and traffic/access disruption.

> The City will work with local residents and businesses, as it does with all construction projects, to minimize disruptions, where possible. This will include adhering to the City of Windsor noise by-law; providing notice in advance of construction, particularly if there could be impacts to driveways and access; and providing a contact information for members of the community to register complaints. Recommended projects that are within road right-of-ways could also have an impact on traffic flow. The City will schedule construction to minimize traffic impacts where possible and will use appropriate traffic management procedures and signage.

Pumping stations and stormwater facilities will become part of the permanent urban landscape.

> Considerations for safety, landscape, recreational opportunities and integration with park space shall be fundamental in the detailed design of the proposed stormwater management corridors. To the extent possible, the aesthetics and landscape of these facilities shall integrate into the cultural landscape and the

Developers shall liaise with the City's Sustainability, Planning and Parks groups to develop a plan that is in keeping with the vision of this community. Noise and vibration could also be a concern for those who live in the immediate vicinity of the proposed pumping stations. The MECP establishes noise limits for facilities, such as pumping stations, and during detailed design, necessary studies and design work will be completed to ensure that the pumping stations are within these limits and do not result in vibration effects for neighbouring properties.

To accommodate the proposed collector road right-of-ways and stormwater management corridors, the purchase and/or consolidation of lands is required.

During the development of the MP, the City has reached out to many of the property owners who may be directly affected by one of the projects. Communications with property owners shall continue during the detailed design of individual projects and the City shall work with owners to come to an amicable property purchase or easement agreement based on fair market value. Where possible, measures to mitigate impacts to those properties shall be considered in all cases, however to support the urbanization and implementation of regional roadways and stormwater facilities acquisition and demolition may be required. **Section 6.2** below describes the land requirements in more detail.

Table 6-2: Potential Effect and Mitigation Measures

Potential Effects	Mitigation
Socio-Cultural Environment	
Archaeological potential - Where areas were identified as having potential for archaeological resources.	Stage 2 archaeological assessments (and further stages, if recommend) for the areas identified will be undertaken by an archaeologist licensed under the Ontario Heritage Act as early as possible during detailed design and prior to any ground disturbing activities. Should archaeological resources be discovered during construction, work will stop immediately and MHSTCI and First Nations communities will be notified. If human remains are encountered, all activities must cease immediately and the local police as well as the Registrar, Burials of the Ministry of Government and Consumer Services (416-326-8800) must be contacted.
Heritage Properties– Where built heritage and/or cultural heritage landscapes were identified for any of the recommended solutions.	Measures to mitigate impacts to heritage listed properties shall be taken as recommended in **Section 4.2** of this report. Measures will include evaluation of vibrational impacts of construction works and identification of vibrational monitoring to occur during construction. Construction traffic routes shall consider resources and where applicable construction fencing to reduce risks shall be installed.

Potential Effects	Mitigation
Construction related noise and dust – Construction can result in temporary noise and dust impacts that could be experienced by local property owners.	The City will adhere to noise by-laws, dust reduction measures will be implemented where applicable, and the City will notify local property owners of construction and provide a contact for any complaints.
Traffic – Construction within road right-of-ways has the potential to impact traffic.	The City will schedule construction to minimize traffic impacts where feasible. Appropriate traffic management procedures and signage will be put in place. Traffic detours will be implemented and emergency access will be maintained.
Property requirements – Construction of the municipal infrastructure will require property acquisition.	The City will continue to reduce property requirements during detailed design where possible and will purchase or negotiate easements for any property required at fair market value.
Loss of Agricultural Lands - Development of lands will require the implementation of infrastructure within lands currently being used for farming.	Timing of infrastructure construction shall align with the approved development so as not to take farm land out of production prematurely.
Impacts to Buildings/Other Uses- To accommodate permanent infrastructure, solutions recommended the future acquisition of property requiring demolition or buildings and/or removal of parking/storage areas.	The City and/or developers shall liaise with the property owner and negotiate acquisition or property at fair market value.

Potential Effects	Mitigation
Visual impact – Most of the recommended solutions will be constructed below the surface (e.g. new sewer pipes) or are anticipated to have minimal visual impact (e.g. roads, ponds, sewers).	The City will consult with neighbours during detailed design of the pumping stations to obtain community input on aesthetics. Stormwater management ponds shall be community amenities that are designed to enhance the community and include features to support recreation while considering safety.
Operational Noise – The operation of a pumping station has some potential to result in noise and vibration.	The City will design pump stations to meet MECP noise criteria and to minimize any potential for vibration impacts on neighbouring properties.

6.1.3 Source Water Protection

Necessary design considerations and risk assessments must be completed to mitigate impacts to source water resources in and around the recommended project areas. As noted above, the Study Area is comprised of a number of drains that are linked and discharge eventually to the Little River that is a tributary to the Detroit River. There are existing drinking water intakes along the Detroit River. Vulnerable Areas (Intake Protection Zones (IPZ)) are required to be protected to mitigate contamination risks to source water. A current map of vulnerable areas can be found on the ERCA website at https://essexregionconservation.ca/. Based on the vulnerable area mapping, the Study Area does not overlap with the IPZ zones. The mapping does show that all drains and surrounding areas are identified as Event Based Areas (EBA) of the A.H Weeks's Water Treatment Plant.

In order to protect source water, projects must consider and follow policies described in the Essex Region Source Protection Plan (SPP), May 2019. **Table 6-3** below lists policies that are applicable to recommendations of this SSMSP and how polices shall be addressed when solutions are implemented. It should be noted that the implementation considerations are relevant to municipal infrastructure whether constructed by the City or Developer. This assessment does not include considerations for future land uses, therefore should proposed land uses pose additional environmental risk, there will need

to bee reviewed by the City and ERCA to confirm that necessary onsite protection measures as implemented.

Table 6-3: Essex Region Source Protection Plan (SPP) Implementation Considerations

Source Water Concern	Threat	Measure	Policy Requirements	Implementation Considerations
Significant Drinking Water Threats	Handling and Storage of Liquid Fuel	Volume greater than 15,000 Litres (L) permanent or temporary.	Notify the Essex Region`s Risk Management Official to develop a Section 58 Risk Management Plan	On a project by project basis, the proponent of the project shall develop a Risk Management Plan. Where applicable, spills response program shall be in place.
Transport Pathways	Alteration of delineation of vulnerable areas.	Creation, relocation or removal of drainage infrastructure.	Formal updates to the Source Protection Plan and Assessment Report	It is likely that the proposed works will alter the delineation of vulnerable areas.
Groundwater	Area is within a significant groundwater recharge area (SGRA).			Projects shall not result in increased contamination of the aquifer. Site assessments to identify existing groundwater wells shall be completed and abandonment of wells shall be completed.

6.1.4 Sustainable Neighbourhood Action Plan

In addition to following the municipal infrastructure design parameters, development shall review the vision and strategies outlined in the Sustainable Neighbourhood Action Plan. The topic areas of the SNAP include: Natural Environment; Green Jobs and the Economy; Climate Leadership; Green Infrastructure; Sustainable Transportation and Mobility; Green Energy; and Community Land Use and Design. The strategies have been summarized below.

- **High energy efficiency for constructed buildings:** New construction should be at least 40% more energy efficient than similar buildings constructed in 2014, resulting in a 40% GHG reduction.
- **Building-scale renewable energy solutions:** Investigate opportunities to implement solutions to address building energy consumption.
- **Block-scale energy networks:** Identify, designate and reserve areas within the neighbourhoods that can be used to implement energy networks.
- **Resilience to climate change and other disruptions:** Explore opportunities to strengthen resilience to power outages within the neighbourhood.
- **Low-carbon transportation:** Encourage transit-supportive development, and provide necessary infrastructure to support electric vehicles.
- **Water and wastewater:** Explore opportunities for heat exchange with water infrastructure and for grey water recycling systems. Encourage high levels of water conversation through fixtures and appliances.
- **Solid waste:** Encourage highest levels of solid waste diversion.
- **Innovation:** Ensure continued flexibility with innovations and emerging technologies in the neighbourhoods.
- **Integration with other plans and studies:** Ensure that other studies in the area consider opportunities identified in the City's energy plan.
- **Incentives for developers:** Identify opportunities to incentivise early action that will build expertise and improve market uptake.

Details on how these objects are achieved are not part of the scope of this study but integral in the development of a comprehensive development plan.

6.2 Private Property Acquisitions and Easements

There are a number of solutions recommended in this SSMSP that require the acquisition of property and/or easements to accommodate new infrastructure. Most notably, shared regional facilities such as collector road right-of-ways and stormwater management corridors will need to be conveyed to the City of Windsor as municipally owned land. The road corridor right-of-way will include road, sewer, utility, pedestrian and lighting infrastructure.

There are varying methods for which property is conveyed for this infrastructure.

- For proposed right-of-ways, lands may be conveyed to the municipality through a draft plan of subdivision; or
- For shared regional facilities, the City will coordinate with the property owners to provide compensation for lands required.

Land acquisition or easements required are expected to be obtained before infrastructure is required and therefore the timing of property acquisitions will be dependent on the need for those elements and the development buildout schedule within the area.

Road Right-of-Ways

Section 5.7.4 describes the various right-of-way corridor widths required to accommodate the proposed municipal infrastructure and the location of each corridor can be referenced in the Road Network **Figure A5-11**.

Stormwater Management Corridors

The proposed Stormwater Management Corridors will include stormwater management ponds, stormwater quality control infrastructure, pumping stations, maintenance pathways, natural heritage linkages and recreation pathways. Their proposed location can be identified in **Figures A5-5** to **A5-7**. This land is not considered parkland and developers are to provide compensation of necessary lands for parkland as described in the Secondary Plans. Through the completion of this Master Plan, the facilities are designated Schedule B and therefore the completion of this study will permit the City to proceed with the acquisition of land as identified in this plan and provide fair

compensation to property owners. Below summarizes the area of land required for the stormwater management corridors.

Table 6-4 includes a list of private properties impacted and the description of outreach or discussions.

Table 6-4: Private Property Easement/Acquisition Consultation

Solution Name	Property Acquisition Description	Area Required (Ha)
Pond P1	Stormwater Management Facility including Dry Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	19.1
Pond P2	Stormwater Management Facility including Wet Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	9.2
Pond P3	Stormwater Management Facility including Dry Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	26.0
Pond P4	Stormwater Management Facility including Wet Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	16.0
Pond P5	Stormwater Management Facility including Wet Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	8.7
Pond P6	Stormwater Management Facility including Wet Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	7.0
Pond P7	Stormwater Management Facility including Wet Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	1.1
Pond P8	Stormwater Management Facility including Wet Pond, Pumping Station, maintenance pathways, natural heritage linkages, and recreation pathways	16.4

Property owners will be compensated for required property based on third party land appraisal that will estimate land costs based on the most current market conditions at time of acquisitions.

6.3 Summary of Infrastructure Costs

Detailed cost estimates were completed as part of **Appendix F: Municipal Functional Design Report** which includes key assumptions and detailed itemized cost estimates.

Table 6-5 below summarizes the total cost of the recommendations of this Master Servicing Plan**.**

Table 6-5: Total Infrastructure Cost Summary

Phase	Total
5 Year Horizon	$37.49M
Phase 1 – East Pelton	$108.73M
Phase 1 – CR42 SPA	$221.40M
Phase 2 – East Pelton	$49.60M
Phase 2 – CR42 Pelton	$296.85M

6.3.1 Cost Sharing

It is the intent of the City is to have developers pay the full cost to develop infrastructure needed to service this Study Area with the City contributing to infrastructure facilities that will service a wider community need beyond local servicing. The City will recover costs for trunk infrastructure through development charges that will be based on the infrastructure listed as required through this study and the costs listed above and in **Appendix F**. Conditions of development charges and reimbursement will be stipulated through the draft plan of subdivision stage for which the landowner will enter into agreement with the City to establish the shared cost of trunk facilities. These agreements will also include stipulation for lands that are needed for public use including stormwater management corridors, natural heritage areas, open drains, trail/greenway features and parkland.

6.4 Project Implementation

This study lays out a plan that will ensure that the SSMSP area will develop in an orderly fashion and be adequately serviced. Development of this area will be completed over many decades; therefore, it is expected that changes to this plan will occur and further, this plan will need to be reviewed and updated on a regular basis. The MCEA stipulates

that master plans shall be thoroughly reviewed every 5 years to ensure that any revisions required are captured in an addendum report. It is recommended that the City continuously review the progress of development in this Study Area as development proceeds and any lessons learned or design standard revisions shall be incorporated into the subsequent updates.

To ensure that the infrastructure implemented to serve development is consistent and coordinated, a site-specific Development Manual entitled "Sandwich South Master Servicing Plan – Municipal Infrastructure Design Manual" will be created. This manual shall be used as the basis for all design in addition to the MECP Guidelines, and most current best management practices at the time of development.

6.5 Staging

As development occurs within the SSMPS Study Area recommended municipal infrastructure will need to be implemented in stages. As noted in this SSMSP, it is difficult to assign horizon years to the infrastructure required to support development because much of the required infrastructure will be triggered by development.

This plan has identified projects that are required to support the build-out of the East Pelton and CR42 Secondary Plan Areas. It is anticipated that each of these areas will develop simultaneously with key internal development proposals being catalyst to support major infrastructure solutions.

CR42 SPA:

- The proposed Regional Hospital is expected to commence construction in 2026 with an opening date of 2031.
- The City has identified the need to construct the Lauzon Parkway and CR42 Intersection to support the transportation network and to help facilitate the construction of Lauzon Parkway to Hwy 401.

East Pelton:

- It is anticipated that the north portion of this SPA will commence servicing upon completion of this Master Plan.

The recommended infrastructure required to service these initial areas have been identified as immediate and shall be implemented within the next 0 to 5 year horizon.

The City has considered these immediate projects in the allocation of funds within the 2023 Capital Works plan, however, not all of them will be funded within the 5-year plan.

Table 6-6: 5-year Horizon Project Implementation Recommendations

Project Title	Project Description
Schedule C Roadway Environmental Assessment	
Collector Road Widening Environmental Assessment - Schedule C	8th Concession Corridor from CR 42 to the EW Arterial Road.
	9th Concession Corridor from CR 42 to the EW Arterial Road.
Transportation	
Lauzon Parkway/CR42 Intersection Improvements	Realignment of Lauzon Parkway between Service Road B and CR42.
CR42 Intersection Improvements	CR42 reconstruction, Lauzon Parkway to the City Boundary.
9th Concession Road	Improvements to 9th Concession Corridor - From County Road 42 to Baseline Road. (0.9 km)
7th Concession Road	Improvements to 7th Concession Corridor - From County Road 42 to the Future E-W Arterial Road. (1.2 km)
Sanitary	
9th Concession Sanitary Trunk Sewer	Construct sanitary trunk sewer along 9th Concession Road from County Road 42 to Baseline Road (0.9 km). Required to serve the Regional Hospital Facility.
Stormwater Management Servicing- Lauzon Parkway and CR 42 Intersection	
P7 Drainage Area - East of Lauzon Parkway, north of CR42	
P7 SWM Pond	Construct receiving pond.
P7 Pumping Station	Construct storm pumping station.
P7 Trunk Storm Sewer on CR42 and Lauzon Parkway	Construct trunk storm sewers servicing the local roadway and discharging to P7 pond.

Project Title	Project Description
P8 Drainage Area - West of Lauzon Parkway, north of CR42	
P8 SWM Pond	Construct receiving pond. Pond construction may be phased to serve the initial Lauzon Parkway reconstruction. The remainder of the airport development lands are not anticipated to develop immediately.
P8 Pumping Station	Construct storm pumping station. Pumping station configuration may be staged based on the phased implementation of the pond storage capacity.
P8 Trunk Storm Sewer - Lauzon Parkway	Construct trunk storm sewers along the Lauzon Parkway from Service Road B to P8.
P8 Trunk Storm Sewer - CR42	Construct trunk storm sewers along the CR42, between 9th Concession and Outlet to P8.
Municipal Drains	
6th Concession Drain Realignment	Relocate 6th Concession Drain from 7th Concession Road to 8th Concession Road. (1.4 km) to be incorporated recommended through a Drainage Report being prepared by Baird AE.
6th Concession Drain Improvements	Repairs to the existing 6th Concession Drain (2.0 km) being recommended through a Drainage Report being prepared by Baird AE.
7th Concession Drain Realignment (E-W Arterial Drain) Construction	Install E-W Municipal Drain from 7th Concession Road to Little River. Decommission 7th Street Drain Diversion (2.9 km)

The Appendix F Functional Design report provides a list of design considerations that need to be considered as development proceeds within this area.

6.6 Completing MCEA Requirements

Most of the projects identified through this study will be initiated to respond to development proposals brought forward by developers and property owners within the Study Area. Section 5.6 identifies the MCEA schedule for each project proposed in this SSMSP.

The City may, as proponent, proceed with the implementation of the capital projects identified and assessed as Exempt or B projects in this study. This includes;

- Storm and sanitary sewers and road reconstructions identified as Exempt projects.
- Stormwater management ponds pumping stations and other Schedule B projects that have been recommended within the East Pelton and the CR42 Secondary Plan Area. These projects will be itemized in the Notice of Completion for the master plan, completing the last remaining consultation step.

The City may also proceed, as a proponent, for the completion of improvements that have been identify as Schedule C projects. Those projects will require additional site investigation, consultation with stakeholders, and identification of additional potential effects and proposed mitigation through the completion of a full planning study including an Environmental Study Report that is reviewed by community members and review agencies.

For some recommended projects, approvals under other legislation may be required (federal, provincial or municipal). For some of these projects, integration or coordination of the MCEA with other legislation or planning processes may be appropriate. This would avoid duplicating similar planning processes and address consultation and information requirements for both.

Continued Monitoring and Servicing

Recommendations identified including staging of the proposed improvements reflect full buildout of proposed development areas. Staging and implementation of proposed improvements will be trigger based on development demands and actual population and building densities implemented. This study along with the SSMSP Growth Management Study provides the parameters for future development and should be followed to ensure that the municipal services proposed will adequately serve the full build out scenario. As development proceeds, each developer will be responsible for providing justification for the corresponding development including the completion of Traffic Impact Studies, Stormwater Management Report and site-specific functional servicing reports.

The following studies, design and approval requirements will influence the schedule for implementation of the solutions outlined in this report:

- Detailed design of all recommended improvements;

- Necessary site assessments, approvals and permits to satisfy regulatory and best management practices; and
- Ministry of Environment, Conservation and Parks (MECP), Environmental Compliance Approval. Coordinate with the City on the completion of Transfer of Review for proposed infrastructure.
- Essex Region Conservation Authority and municipal permitting and approvals.

The City will need to review the need to complete a detailed formal review and/or update of the MP every 5 years. Potential changes which may trigger the need for a detailed review are as follows:

- Major changes to original assumptions;
- Major changes to components of the MP;
- Significant new environmental effects; and
- Major changes in proposed timing of projects within the MP.

7.0 References

Bill 23, More Homes Built Faster Act, 2022

ERCA clarifies programs and services in relation to Bill 23. December 7, 2022

City of Windsor, Official Plan, Volume II, Chapter 8 – County Road 42 Planning Area, and City of Windsor Municipal Heritage Register, March 24, 2022

Municipal Class Environmental Assessment, Municipal Engineering Association (March 2023)