HIGHWAY 401 AND LAUZON PARKWAY INTERCHANGE STUDY

GWP 3028-23-00

November 2025

Ministry of Transportation, Ontario

Transportation Environmental Study Report

TRANSPORTATION ENVIRONMENTAL STUDY REPORT

Highway 401 and Lauzon Parkway Interchange Study (GWP 3028-23-00)

November 2025

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THE PUBLIC RECORD
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 AND LAUZON PARKWAY INTERCHANGE STUDY (GWP 3028-23-00)
TRANSPORTATION ENVIRONMENTAL STUDY REPORT

This Transportation Environmental Study Report (TESR) is available for review from November 20, 2025 to December 19, 2025, on the study website (www.hwy401lauzon.ca) and at the following locations:

- City of Windsor Public Library Budimir Branch- 1310 Grand Marais Road West, Windsor
- Essex Public Library LaSalle Branch – 5950 Malden Road, Windsor
- City of Windsor Public Library Fontainebleau Branch-3030 Rivard Avenue, Windsor

This project is being conducted in accordance with the 2024 Class Environmental Assessment (EA) for Provincial Transportation Facilities and Municipal Expressways, a process approved under Ontario's Environmental Assessment Act, as outlined in Section 2.0 of this report. Classified as a Group "B" project under the same Class EA framework, this study follows the process accepted and approved under Ontario's Environmental Assessment Act, which includes projects that modify access or add capacity to existing provincial transportation facilities, including new interchanges.This TESR fulfills the documentation requirements of the Class EA. In accordance with the requirements of the Class EA, this report is being submitted for a 30-day comment period from November 20, 2025 to December 19, 2025

Interested persons are encouraged to review this TESR and provide written comments to the study team by December 19, 2025. All comments and concerns should be sent directly to either of the following study team members:

Adam Barg, P.Eng.
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Stantec Consulting Ltd.
200 - 835 Paramount Drive
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659 Exeter Road
London ON N6E 1L3
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In addition, a request may be made to the Ministry of the Environment, Conservation and Parks (MECP) for an order requiring a higher level of study (i.e., requiring an individual/ comprehensive environmental assessment approval before being able to proceed), or that conditions be imposed (e.g., requiring further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered.

Requests should include the requester's contact information, full name, and specify what kind of order is being requested (request for conditions or a request for an individual/ comprehensive environmental assessment), how an order may prevent, mitigate or remedy potential adverse impacts on Aboriginal and treaty rights, and any information in support of the statements in the request. This will ensure that the MECP is able to efficiently begin reviewing the request.

The request should be sent in writing or by email to the below MECP contacts, as well as copied to MTO:

Minister of the Environment, Conservation and Parks
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto, ON M7A 2J3
Minister.mecp@ontario.ca

Director, Environment Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto, ON M4V 1P5
EABDirector@ontario.ca

Upon reviewing comments received from the public, the Minister of Environment, Conservation and Parks may make a Section 16 Order on their own initiative within 30 days from the end of the comment period set out in the Notice of Completion. If no concerns or issues are outstanding within 30 days from the end of the comment period set out in the Notice of Completion, the project is considered to have met the requirements of the Class EA, and MTO may proceed to design stage, subject to the commitments documented in the TESR, and obtain any outstanding environmental approvals.

If you have any accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Comments and information are being collected to assist the MTO in meeting the requirements of the Ontario Environmental Assessment Act. Information will be collected in accordance with the Freedom of Information and Protection of Privacy Act. All comments will be maintained on file for use during the study and, with the exception of personal information, may be included in study documentation and become part of the public record.

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EXECUTIVE SUMMARY

GENERAL DESCRIPTION OF PROJECT

Stantec Consulting Ltd. has been retained by the Ontario Ministry of Transportation (MTO) to undertake a Preliminary Design and Class Environmental Assessment (Class EA) Study for a new interchange at the future Lauzon Parkway connection to Highway 401. This study is building upon the approved Municipal Class EA Study for the Lauzon Parkway, which included a proposed interchange connection at Highway 401. The study area is located in the City of Windsor and Town of Tecumseh in Essex County. This study included reviewing existing conditions, developing and evaluating interchange alternatives and associated improvements, and developing environmental protection and mitigation measures.

This *Transportation Environmental Study Report* (TESR) documents the decision-making process, and includes a description of the project purpose; the existing technical, natural, social, economic, and cultural environmental factors; identification and evaluation of alternatives that were considered; consultation activities, including a record of the comments received and how they were considered; the Recommended Plan; anticipated environmental effects and proposed mitigation measures; and, commitments to future work and monitoring.

ENVIRONMENTAL ASSESSMENT PROCESS

This Class EA Study was carried out under the requirements of the MTO Class EA (2024) as a Group “B” undertaking, which includes major improvements to existing transportation facilities, including highway improvements over land or water that provide a significant increase in traffic capacity or cause a significant widening of the “footprint” beyond the roadbed of an existing highway.

TRANSPORTATION NEEDS ASSESSMENT

The Transportation Needs Assessment process is part of the ongoing management and administration of the transportation systems by the Province. Assessment of needs can result in a number of recommendations, including initiating a study, initiating major or minor improvements, initiating routine maintenance, monitoring a situation, or doing nothing. Given the range of potential outcomes, the transportation needs assessment process includes the following:

- Identifying transportation problems and opportunities
- Evaluating and selecting reasonable alternatives
- Developing potential transportation study objectives
- Initiating the study process

PROBLEMS AND OPPORTUNITIES

This Class EA was initiated to address the following problems and opportunities with the existing highway network:

- Provide a new interchange to connect Highway 401 and the future Lauzon Parkway
- Improve connectivity for future industrial, commercial and residential growth
- Improve active transportation connections
- Modifications to Concession Road 10 and / or Concession Road 9 structures

EVALUATION OF ALTERNATIVES

The Environmental Assessment Act requires that ‘reasonable alternatives’ be considered in addressing identified problems and/or opportunities. This involves two levels of analysis. The “Alternatives to the Undertaking” considers a broad range of alternatives that could address the project needs. Once the best alternative is selected, Alternative Methods of Carrying out the Undertaking are studied in greater detail.

ALTERNATIVES TO THE UNDERTAKING

The Alternatives to the Undertaking considered as part of this assignment consisted of:

- Do Nothing
- Optimize the Existing Transportation System
- Expand / New Non-Road Infrastructure
- Widen / Enhance Existing Road Network
- Establish Connection between Highway 401 and Future Lauzon Parkway

The Do Nothing, Optimize the Existing Transportation System, Expand / New Non-Road Infrastructure and Widen / Enhance Existing Road Network alternatives were not carried forward as they did not address all the identified problems and opportunities. Establish a Connection between Highway 401 and the Future Lauzon Parkway was selected as the preferred Alternative to the Undertaking. A series of alternative methods of carrying out the undertaking were developed in greater detail and are discussed below.

ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING

A series of preliminary design alternatives were developed and evaluated to address the identified problems and opportunities. Two alternatives for a future interchange between Highway 401 and the future Lauzon Parkway, three alternatives for a multi-use pathway, and four alternatives each for the preliminary structure alternatives at Concession Road 9 and 10. The alternatives included:

Interchange Alternatives:
Alternative 1 – Teardrop Interchange

Alternative 2 – Parclo A4 Interchange

Multi-use Pathway (MUP) Alternatives:
Alternative 1 – Stand-alone Bridge over Highway 401

Alternative 2 – MUP incorporated into ramps and new Lauzon Parkway bridge

Alternative 3 – MUP on Concession Road 9 new bridge

Preliminary Structure Alternatives – Concession Road 9:
Alternative 1 – Replace on Existing Alignment Concession Road 9 bridge - Closed with detour

Alternative 2 – New Alignment East of Existing Bridge Concession Road 9 - Bridge Open with two Lanes

Alternative 3 – New Alignment West of Existing Bridge Concession Road 9 - Bridge Open with two Lanes

Alternative 4 – Permanent Full Closure of Concession Road 9

Preliminary Structure Alternatives – Concession Road 10:
Alternative 1 – Replace on existing Alignment Bridge - Closed with detour

Alternative 2 – New Alignment East of Existing Bridge Concession Road 10 - Bridge open with two lanes

Alternative 3 – New Alignment West of Existing Bridge Concession Road 10 - Open with two Lanes during Construction

Alternative 4 – Permanent Full Closure of Concession Road 10

Following the development of alternatives, a detailed evaluation of alternatives was carried out to identify an improvement plan that is cost-effective, provides safe operations, and provides reasonable local access, while minimizing effects on the natural, social, and cultural environments.

Following the evaluation of alternatives, and consultation with the public, Indigenous communities, agencies and community stakeholders, a Recommended Plan was selected.

RECOMMENDED PLAN

The Recommended Plan includes a Parclo A4 interchange, replacement of the existing Concession Road 9 bridge on the existing horizontal alignment, temporarily closed with a local road detour, and permanent full closure of Concession Road 10 at the crossing of Highway 401 following the removal of the existing bridge, and a Multi-Use Pathway (MUP) on the new Concession Road 9 bridge. The Recommended Plan is shown on Figure 1.

PUBLIC CONSULTATION

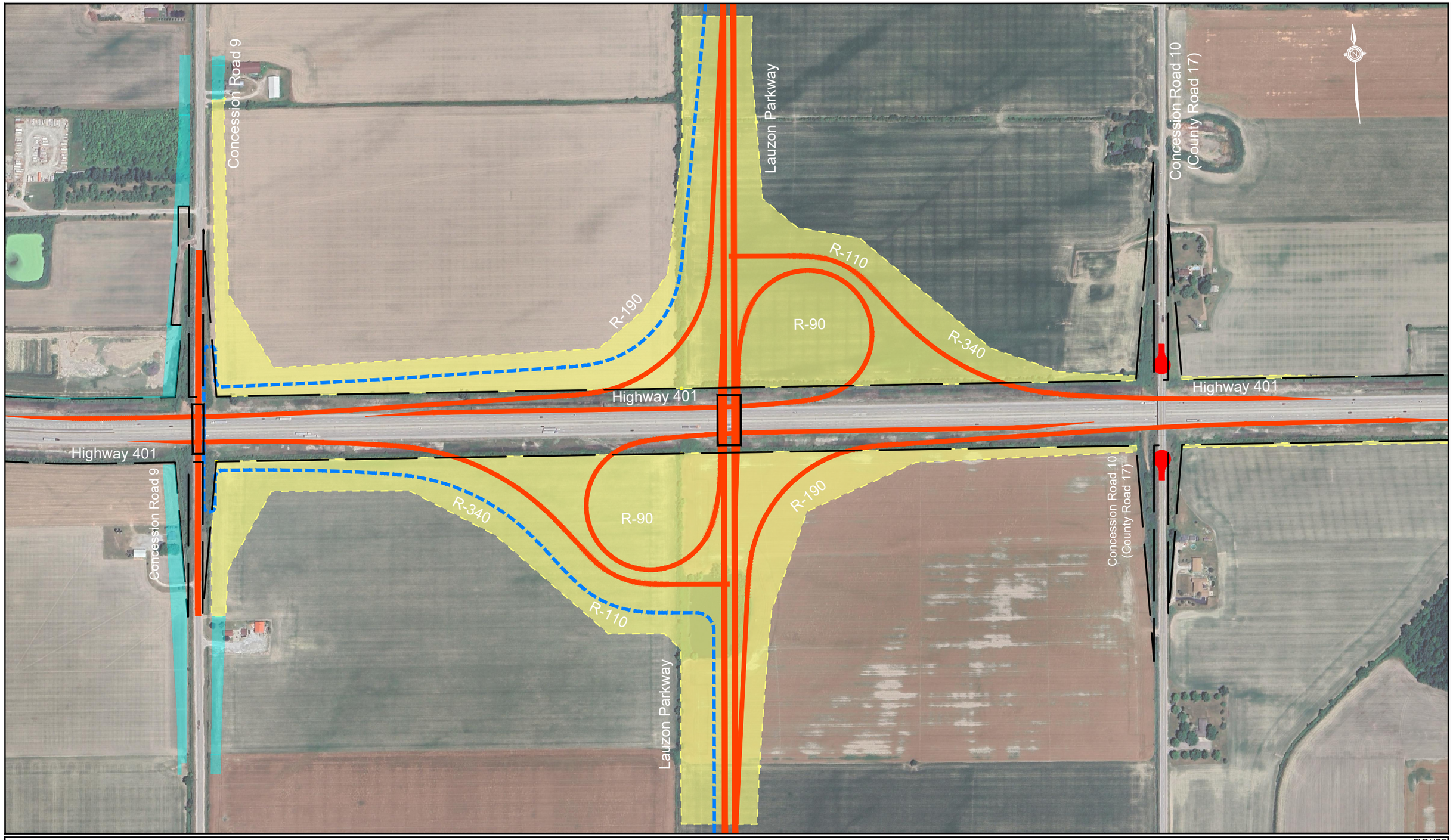
The main objective of consultation in the Class EA process is to ensure that project information is shared in a meaningful way, and that consideration is given to all aspects of the environment from the earliest stages of planning. To achieve this, a variety of communication strategies were used to engage the public, agencies, interest groups, property owners and community members. Numerous opportunities for input were provided at key points during the study process including a Notice of Study Commencement and one Public Information Centre (PIC). In addition, direct contact with the Project Team via mail, email and phone was encouraged throughout the study.

A project website (www.hwy401lauzon.ca) was developed at the onset of the study to provide the public with access to project information. The project website was maintained throughout the study process, including project updates, notifications of public events, project team member contact information, PIC materials and links to project-specific documentation.

An outline of the public consultation activities is provided in Section 8.0.

POTENTIAL ENVIRONMENTAL EFFECTS, PROPOSED MITIGATION AND COMMITMENTS TO FUTURE WORK

Overall, due to the scope of the work, the project will result in minor environmental impacts that can be appropriately mitigated through standard protection and mitigation measures. Minor impacts that may occur include potential disturbance to local vegetation, impacts to Little River and potential realignment, and wildlife in the southwest quadrant of the intersection and construction-related issues like noise, erosion, sedimentation, and the management of invasive species. A summary of environmental effects and proposed mitigation measures, as identified during the course of this study, is provided in Section 11.0, and forms a comprehensive list of commitments to be adhered to during the subsequent design phase of the project.



Stantec

HIGHWAY 401
Windsor, ON
GWP 3028-23-00
Assignment Number 3023-E-0020

LEGEND

- Existing Highway 401 Right-of-way
- New Roadway
- New Multi-Use Path
- Property Required
- Potentially Required Property to be confirmed in Detail Design

Lauzon Parkway Interchange

Recommended Plan

SCALE 1:5000

FIGURE 1

1.0 Overview of the Undertaking

1.1 Introduction

Stantec Consulting Ltd. has been retained by the Ontario Ministry of Transportation (MTO) to undertake a Preliminary Design and Class Environmental Assessment (Class EA) Study for a new interchange at the future Lauzon Parkway connection to Highway 401. This study is building upon the approved Municipal Class EA Study for the Lauzon Parkway, which included a proposed interchange connection at Highway 401. The study area is located in the City of Windsor and Town of Tecumseh in Essex County.

This study included reviewing existing conditions, developing and evaluating interchange improvement alternatives, and developing environmental protection and mitigation measures. A Recommended Plan is confirmed and designated (protected) at the completion of the study.

1.2 General Description of the Project

The purpose of this study is to identify a Recommended Plan for improvements as part of the Ministry's ongoing review of safety and operational needs for the provincial highway network.

This study is a Group "B" project under the *Class Environmental Assessment* (Class EA) *for Provincial Transportation Facilities and Municipal Expressways* (2024) and includes undertaking environmental and engineering field investigations and seeking input from stakeholders, external agencies, Indigenous communities, and the public. This study included a review of existing conditions and a Transportation Needs Assessment to determine the scope and extent of intersection improvements. A Recommended Plan and preliminary design have been completed, in consideration of the feedback received during the course of this study.

1.2.1 Study Area

The study area is located in the City of Windsor and Town of Tecumseh in Essex County. The interchange is located at Highway 401 connection to the future Lauzon Parkway, as shown in Figure 2.

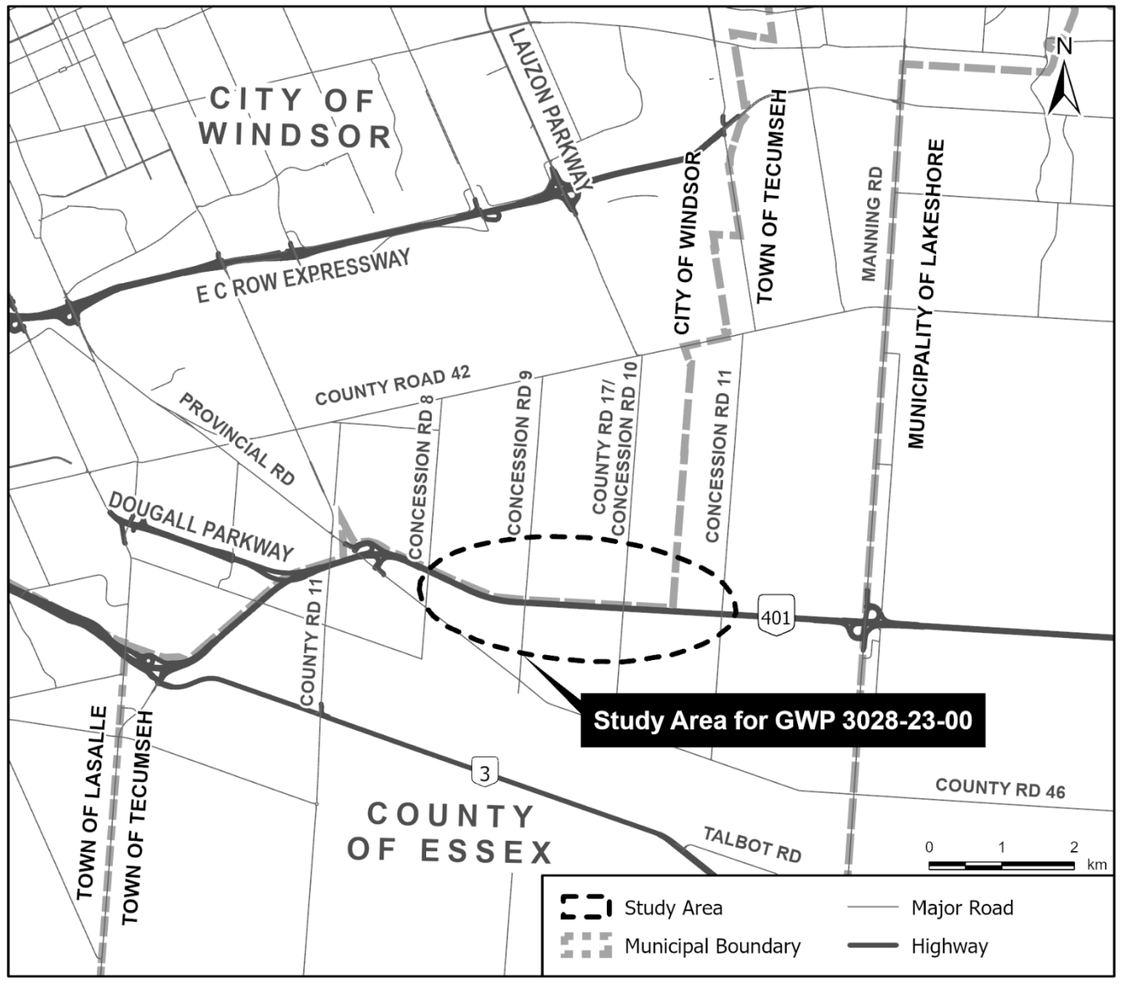


Figure 2: Study Area Location Plan

1.3 Project Background and Adjacent Studies

This interchange study will build upon the previous Municipal Class EA Study for the Lauzon Parkway, which included a proposed interchange at Highway 401. The previous study was completed over 10 years ago. The MTO, the City of Windsor and the County of Essex, completed a Municipal Class Environmental Assessment (EA) Study to address the future requirements for Lauzon Parkway, County Road 42, and the future East-West Arterial.

An Environmental Study Report (ESR) dated January 2014 and a May 2015 Addendum documented the Class EA Study and was carried out in accordance with the Municipal Class Environmental Assessment (October 2000 as amended in 2007 and 2011).

The Study identified a Recommended Plan for the extension and widening of the municipal Lauzon Parkway. A potential interchange at Highway 401 and the future Lauzon Parkway from E.C. Row Expressway was identified as part of Phase 1 in the ESR. This MTO Preliminary Design study reviewed the previously proposed interchange alternatives, addresses current standards and regulations, updated existing conditions, and will advance the design of the interchange to be able to proceed to Detail Design.

1.4 Purpose of the Transportation Environmental Study Report

This *Transportation Environmental Study Report* (TESR) documents the decision-making process, and includes a description of the project purpose; the existing technical, natural, social, economic, and cultural environmental factors; identification and evaluation of alternatives that were considered; consultation activities, including a record of the comments received and how they were considered; the Recommended Plan; anticipated environmental effects and proposed mitigation measures; and, commitments to future work and monitoring.

The TESR fulfills the documentation requirements of the Class EA process for a Group “B” project. The TESR is filed for a 30-day comment period. If you have any questions and/or concerns regarding this study, please contact either one of the following individuals:

Adam Barg, P.Eng.
Principal, Transportation, Consultant Project Manager
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Stoney Creek ON L8J 0B4
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Sinisa Sakic, P.Eng.
Project Engineer
Ministry of Transportation, West Region
659 Exeter Road
London ON N6E 1L3
Tel: 519-854-9586
Email: comments@hwy401lauzon.ca

Interested persons may provide written comments to the study team by December 19, 2025.

1.4.1 Environmental Clearance

If there are no significant concerns following the Public Comment Period, or once the Minister of the Environment, Conservation and Parks has reviewed and considered any Section 16 Requests, the project may be eligible for Environmental Clearance and continue to move forward. This will permit MTO to:

- Relocate utilities
- Initiate subsequent study stages (i.e., Detail Design) for the Recommended Plan

Although the timeline for implementing the results of this study is not confirmed, this planning will assist MTO, municipalities, Indigenous communities, business owners, and private landowners with future planning and development within the study area. The implementation of the identified improvements is dependent on regional and provincial priorities and available funding.

1.4.2 Property Acquisition

As part of the study, the Ministry will also negotiate temporary and permanent property acquisition, consistent with the project needs (including ROW designation). Directly impacted property owners have been notified by the Project Team and the Ministry is committed to working with property owners to make sure they understand the property acquisition process and their rights. Property owners are entitled to fair compensation and will be treated in a consistent manner. The Ministry will work with all affected property owners and make offers to purchase based on an independent market value appraisal.

2.0 Class Environmental Assessment Process

2.1 Classification of Project

This Preliminary Design and Class Environmental Assessment (EA) Study was carried out under the requirements of the MTO Class EA (2024) document. Based on the nature and extent of the project, the MTO Class EA document specifies different groups under which projects may be planned, and the assessment process required for each. Provided that this process is followed, and its requirements are met for a project, the requirements of the Ontario Environmental Assessment Act are considered to be met. This project is being carried out following the requirements of the Class EA as a Group "B" undertaking, which includes major improvements to existing transportation facilities, This study aligns with the 2014 ESR and municipal process while fulfilling the requirements of the MTO Class EA process and includes a review of the previous alternatives developed as part of the 2014 ESR, refinements to the alternatives, an evaluation of alternatives, and selection of a preferred plan. The MTO Class EA(2024) process for a Group B undertaking is described in Table 1.

For additional information on the MTO Class EA process, the public may contact the Project Team (contact information provided in Section 1.4). In addition, the following documents are available to assist with understanding the process:

- Class Environmental Assessment for Provincial Transportation Facilities and Municipal Expressways, MTO, February 2024
- Environmental Reference for Highway Design, MTO, 2006, updated in June 2013
- Code of Practice for Preparing, Reviewing, and using Class Environmental Assessments in Ontario, MOE, January 2014

Please contact the Project Team (contact information provided in Section 1.4) if you would like to view the documents noted above.

Table 1: Class EA Process, Group B Undertaking

Preliminary Design	Consultation
<u>Data Collection</u> Review available background information and conduct field investigations as required to identify existing conditions in the study area	Notifications and project website
<u>Generate & Evaluate</u> Develop preliminary design alternatives to address structural needs, improve the highway safety and operations, and consider potential impacts to the existing natural, social, and cultural environment to identify a preferred plan	Agency and Municipal Meeting
<u>Select</u> Identify the preferred plan and mitigation measures to address potential impacts	Public Information Centre
<u>Refine</u> Complete preliminary design of the preferred plan including a potential implementation strategy	Municipal Meetings
<u>Report</u> Document the process leading to the preferred plan	Transportation Environmental Study Report 30-day public comment period
<u>Clearance</u> The Class EA requirements are met, and the project is cleared to proceed to detail design	Environmental Clearance
<u>Future Stages</u> Detail Design and Construction	Consultation during Detail Design and Construction

2.2 Environmental Assessment Approval Regulations

A Preliminary Design and Class EA Study of this type must be carried out in accordance with applicable environmental legislation and the current government policies and procedures. The policies and legislation that apply to this study are described below.

2.2.1 Ontario Environmental Assessment Act

The Ontario *Environmental Assessment Act* (EAA) governs the conduct of planning studies in the province of Ontario. The purpose of the EAA is to confirm that:

- A reasonable and traceable planning process is followed
- The need for the project is demonstrated
- The public has input into the process and investigations
- The study includes a review of a full range of alternatives
- The selected alternative minimizes any environmental impacts or provides mitigation strategies to minimize impacts resulting from the improvements

3.0 Transportation Needs Assessment

The Transportation Needs Assessment process is part of the ongoing management and administration of the transportation systems by the province. Assessment of needs can result in a number of recommendations, including initiating a study, initiating major or minor improvements, initiating routine maintenance, monitoring a situation, or doing nothing. Given the range of potential outcomes, the transportation needs assessment process includes the following:

- Identifying transportation problems and opportunities
- Evaluating and selecting reasonable alternatives, including 'do nothing'
- Developing potential transportation study objectives
- Initiating the study process

This section of the report provides an overview of the transportation needs assessment and assessment of Alternatives to the Undertaking that led to the initiation of this study.

3.1 Problems and Opportunities

This Class EA was initiated to address the following problems and opportunities:

Problems:

- A connection is required between the future proposed Lauzon Parkway extension and Highway 401
- Existing underpasses at Concession Road 10 (County Road 17) and Concession Road 9 may be impacted by a potential interchange

Opportunities*:*

- Provide a new interchange to connect Highway 401 and the future Lauzon Parkway
- Improve connectivity for future industrial, commercial and residential growth
- Improve active transportation connections

3.2 Alternatives to the Undertaking

The Environmental Assessment Act requires that 'reasonable alternatives' be considered in addressing identified problems and/or opportunities. This involves two levels of analysis. The 'Alternatives to the Undertaking' considers a broad range of alternatives that could address the project needs. Once the best alternative is selected, the Alternative Methods of Carrying out the Undertaking are studied in greater detail.

The Alternatives to the Undertaking identified for this study are listed below:

- Do Nothing - Existing facility as is
- Optimize the Existing Transportation System - Transportation Demand Management shifts demand on the highway network by shifting demands to the time periods outside of the critical congestion periods and shifts demand to alternative modes of transportation.
- Expanded/ New Non-Road Infrastructure - Initiatives including new or improved local transit service for public transportation, increased freight rail services for goods movement
- Widen / Enhance Existing Road Network - Expansion of existing municipal and regional road networks
- Establish Connection between Highway 401 and Future Lauzon Parkway

A process has been developed to evaluate the conceptual options and select only the most reasonable alternatives for more detailed study. This process allows unreasonable alternatives or alternatives that do not meet provincial policy requirements to be eliminated from consideration in advance of the detailed development of alternatives and evaluation stage.

The preliminary assessment of the alternatives to the undertaking uses the following screening criteria:

- Does the option realistically address all the problems and opportunities?
- Does the option make a significant contribution towards realistically addressing all of the problems and opportunities?

Only those alternatives that satisfy at least one of the above criteria were carried forward.

The assessment of Alternatives to the Undertaking along with recommendations are summarized in Table 2.

Table 2: Screening Assessment of Alternatives to the Undertaking

Alternatives to the Undertaking	Does it address the problems/opportunities?
Do Nothing Area transportation system would be limited to maintenance of current transportation infrastructure and the implementation of approved provincial and municipal initiatives.	× **Does not** address the identified problems and opportunities. **Do not carry forward.**
Optimize the Existing Area Transportation System Optimize the existing area transportation system by Travel Demand Management (TDM) and Transportation Systems Management (TSM). TDM will improve the operation of transportation by managing travel demand during peak hours. TSM will improve the transportation system through strategies and technology policy initiatives.	× **Does not** address the identified problems and opportunities. **Do not carry forward.**
Expanded / New Non-Road Infrastructure Initiatives including new or improved local transit service for public transportation, increased freight rail services for goods movement, providing inter-regional transit and passenger rail, and/or providing provincial transitways through new/increased services.	× **Does not** address the identified problems and opportunities. **Do not carry forward.**
Widen / Enhance Existing Road Network Widen/enhance municipal arterial roads to improve capacity and operations and provide congestion relief on existing facilities through additional lanes to increase the performance of the overall transportation network.	× **Does not** address the identified problems and opportunities. **Do not carry forward.**
Establish Connection between Highway 401 and future Lauzon Parkway Includes a new interchange at Highway 401 and the future proposed Lauzon Parkway to provide improved capacity and operations.	✓ **Addresses** the identified problems and opportunities. . **Carry forward.**

4.0 Existing Conditions

Background studies and site-specific field investigations were carried out to help assess existing environmental conditions, including archaeology, contamination, fisheries and aquatic resources, terrestrial resources, groundwater, landscaping and vegetation, and land use. All work was carried out in accordance with the requirements of the *Environmental Reference for Highway Design* (2013), which provides standards for scope of work, evaluation of potential impacts and proposed mitigation measures for MTO undertakings.

The background reviews to identify existing conditions were carried out in the Spring of 2024. Significant environmental features and/or constraints identified as a result of the background studies were documented and considered during the development and evaluation of alternatives.

Site-specific field investigations were limited to areas within the MTO right-of-way and locations where permission to enter was granted by property owners. Due to outstanding permissions to enter on private properties within the study area, remaining site-specific field investigations will be completed during the Detail Design phase to confirm existing conditions and inform the development of appropriate protection and mitigation measures.

4.1 Natural Environment

An inventory of natural environment features within the study area was undertaken based on a review of previous and relevant studies, field investigations and information received from external agencies and the public during the course of this study.

4.1.1 Physiography, Geology and Soils

The study area is within the Ecoregion 7E (Lake Erie – Lake Ontario Ecoregion), and more specifically, the Ecodistrict of 7E-1 (Essex). This area consists of a flat landscape underlain by Paleozoic bedrock. Calcareous fine-textured morainal material is deposited over much of the region. The morainal deposits are generally deep and are covered by a thin layer of glaciolacustrine material. Most of the land cover has been converted to agricultural land use types (cropland, pasture). Natural areas make up 7% of the land cover and the remaining 3% is devoted to settlement and associated infrastructure. Less than 1% of the Ecodistrict is comprised of protected areas.

Water well records (WWR) from the Ministry of the Environment, Conservation and Parks (MECP) mapped within the study area indicate that the overburden ranges from approximately 21 m to 42 m in thickness. The overburden is generally comprised of clay ranging from approximately 18 m to 39 m in thickness, underlain by layers of sand/quicksand, clay, hardpan, and/or sand and gravel. Bedrock was mostly described as limestone with a few occurrences of shale noted.

4.1.2 Drainage, Surface Water, Groundwater, and Source Water

The study area lies within the Essex Region Source Protection Area (SPA) and extends across the Little River Subwatershed and Pike Creek Subwatershed, within the jurisdiction of the Essex Region Conservation Authority (ERCA). Little River, Pike River and several municipal drains intersect the study area. Surface drainage flows mainly northerly and eventually drains into Lake St. Clair, with some drainage also flowing northwesterly into the Detroit River.

There are several small ponds located within the study area. However, the study area does not include any Provincially Significant Wetlands (PSWs) or Areas of Natural and Scientific Interest (ANSI).

There are 27 WWRs within the study area, with 13 water supply wells reported for domestic/livestock uses Based on a review of the MECP WWRs. These water wells were installed between 1952 and 1978, and all completed within bedrock to depths between approximately 25 m and 55 m Below Ground Surface (BGS).

There is potential for additional rural properties within the study area to be supplied by private groundwater wells that are not associated with a mapped WWR. These potential six (6) additional properties include three (3) residences along Concession Road 9 (1 north and 2 south of Highway 401), one (1) residence along County Road 17 (Concession Road 10) to the north of Highway 401, and two (2) residences along Concession Road 11 to the south of Highway 401; with the closest being about 350 m east of the proposed new interchange.

Based on the WWR review, the mapped water supply wells within the study area are intermediate/deep installations within bedrock that are overlain by thick confining clay/till deposits and less susceptible to surface contamination or construction impacts.

As part of detailed design, the location of below ground excavation and potential groundwater construction dewatering should be reviewed with respect to the potential private supply wells to determine the need for and extent of private well monitoring in select areas. Based on the private well locations and construction details, and the anticipated construction activity, a minimal private well monitoring program is anticipated at this time.

The Essex Region Source Protection Committee (ERSPC) completed source water protection assessments for the Essex Region Source Protection Areas. ERSPC identifies vulnerable areas in the region, and the applicable “drinking water threats”, which are subject to regulation. Issue Contributing Areas (ICAs) were also defined for municipal sources, as needed, where historical raw water quality data suggested that anthropogenic activity could be deteriorating drinking water quality.

The study area does not cross/intercept any Wellhead Protection Areas, Highly Vulnerable Aquifers, Significant Groundwater Recharge Areas (SGRAs) or Issue Contributing Areas.

There are mapped SGRAs located further west and southwest of the study area with medium vulnerability scores of 4. The study area intercepts Intake Protection Zone 3 (IPZ-3) and associated Events Based Areas (EBA) for the Windsor Water Treatment Plant. The Essex Region Source Protection Plan includes policies related to IPZs/EBAs for the handling, storage, or transportation of fuel and chemicals that may apply to the proposed construction activities. Applicable mitigation measures should be included for construction within IPZs/EBAs).

The pond located south of Highway 401, adjacent to Little River, near the central portion of the study area is within the proposed interchange configuration. This pond will likely be impacted by construction and may require dewatering/alteration. There is limited information available regarding this pond and further investigations will be undertaken during Detail Design.

The *Groundwater Assessment Report* (Stantec 2024) is on file with MTO.

4.1.3 Potentially Contaminated Property

An Assessment of Past Uses (APU) was completed to determine the potential for the presence of subsurface contamination in the study area associated with current or historical land uses in and adjacent to the study area. The APU included a review of available background information and datasets and completion of a site reconnaissance in the study area.

The APU identified several potential sources of contaminating activities, including records of de-icing compounds, commercial trucking and container terminals, waste disposal and waste management, and metal fabrication. In total, four Areas of Potential Environmental Concern were identified within and/or adjacent to the study area. More detailed information is documented within the *Assessment of Past Uses Report,* a copy of which is on file with MTO.

4.1.4 Designated Areas

Designated Areas have special or unique value and are defined by government authorities and/or the public, and through legislation, policies, or approved management plans. These areas may have a variety of ecological, recreational, or aesthetic features and functions that are highly valued. Designated Areas include but are not limited to: Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), heritage rivers and national and provincial parks.

There are no Natural Environment designation lands present, which are locations with Significant Terrestrial Features or Provincially Significant Woodlands. Natural features are instead associated with watercourses such as Little River, or drainage features. A woodlot is located on the south side of Highway 401 between Concession Road 10 / County Road 17 and County Road 43, although no information about it is provided in the Official Plan mapping. No PSWs, ANSIs, Provincial Parks, Conservation Reserves, or known Significant Wildlife Habitat are present within the study area.

4.1.5 Terrestrial and Aquatic Ecosystems

Terrestrial and aquatic ecosystem conditions were assessed as part of this study based on a review of existing/available information and field investigations. Background information was obtained from the Ministry of Natural Resources (MNR) and published resources, and field investigations were conducted from May to September 2024. The findings of these investigations are documented within the *Terrestrial Ecosystems Existing Conditions and Preliminary Design Report* and *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report*, copies of which are on file with MTO. All field investigations were conducted according to the MTO *Environmental Reference for Highway Desig*n (2013) and the MTO *Environmental Guide for Fish and Fish Habitat* (2020).

4.1.5.1 Fisheries and Aquatic Resources

Within the study area, eleven watercourses were assessed. Of these, six were identified as providing direct or indirect fish habitat and were monitored. These watercourses exhibit warmwater thermal regimes and support either permanent or intermittent flow. The fish communities documented are primarily composed of tolerant species, common baitfish, and sportfish.

No provincially or federally regulated aquatic species were recorded within any of the assessed watercourses. Similarly, no Significant Fish Habitat, as defined in the Interim Environmental Guide for Fisheries, was identified at the surveyed locations. It should be noted, however, that not all sites were sampled due to lack of Permission to Enter (PTE).

The Little River Drain, one of the six monitored locations, crosses beneath Highway 401 approximately 675 m east of Concession Road 9 in the Municipality of Windsor-Essex. At this location, the watercourse maintains a permanent flow regime but has no assigned thermal classification. The channel is a constructed open drain, rated as a Class F drain at Highway 401. North of the Hurley Drain confluence, however, it remains unrated under the DFO drain classification system. Class F drains typically exhibit intermittent flow regimes and are not generally known to support a distinct class of fish species.

Fish species documented within the six watercourses include Banded Killifish (*Fundulus diaphanus*), Goldfish (*Carassius auratus*), Northern Pike (*Esox lucius*), Pumpkinseed (*Lepomis gibbosus*), and White Sucker (*Catostomus commersonii*).

4.1.5.2 Terrestrial Ecosystems

The terrestrial ecosystem is defined as the interaction of land, air, water, and biotic components functioning as an ecological unit over space and time, and includes vegetation, wetlands, wildlife, and wildlife habitat. The primary terrestrial concerns related to transportation projects include loss of habitat or habitat function, and habitat fragmentation.

The study area has been influenced by human activity including agricultural activities, and residential, industrial and commercial land use. Based on available background data and field investigations carried out as part of the *Terrestrial Ecosystems Existing Conditions Report*, vegetation units and wildlife habitat were identified.

Species at Risk and Species of Conservation Concern

Significant species are considered at a number of levels, including globally, nationally and provincially. In Ontario, significant species include species that are provincially rare (with a Provincial S-rank of S1 to S3) or listed as Endangered, Threatened, or Special Concern on the Species at Risk in Ontario list (SARO) and/or Schedule 1 of the federal *Species at Risk Act* (SARA).

The Ontario *Endangered Species Act (ESA), 2007* prohibits harm or harassment to Threatened or Endangered species, and damage or disturbance to their habitat. The ESA applies on all private and Crown owned lands in Ontario. Habitat protection under the ESA typically includes all habitats that directly or indirectly support Species at Risk (SAR).

Federally protected Endangered, Threatened and Special Concern species are listed in Schedule 1 of the *Species at Risk Act, 2002* and apply only to federally owned lands. Fish species are protected under the *Fisheries Act* and migratory bird species are protected under the *Migratory Bird Convention Act*, both of which are afforded protection on all lands.

Provincial ranks (S-ranks) are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and vegetation communities. They are based on the number of occurrences in Ontario and are not legal designations. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be determined. Species with provincial ranks of S1 to S3, and those tracked by the MNRF, are considered species of conservation concern. Provincial S-ranks are defined as follows:

S1: Critically imperiled-usually fewer than 5 occurrences

S2: Imperiled- usually fewer than 20 occurrences

S3: Vulnerable- usually fewer than 100 occurrences

S4: Apparently secure- uncommon but not rare, usually more than 100 occurrences

S5: Secure- common, widespread, and abundant

S-rank followed by a "?" indicates that the rank is uncertain

The probability that a Significant Species may be present within the study area was assessed by comparing preferred habitat types to existing conditions documented within the background review and during the May to September 2024 field investigations. Significant Species with preferred habitat in the study area were considered likely to be present. Significant Species with no preferred habitat in the study area were assumed to be absent. Field investigations also included an acoustic bat survey. Wildlife Acoustics bat detectors were deployed at 11 stations within areas where suitable bat habitat was identified during the bat habitat assessment to record the ultrasonic echolocation calls of passing bats. Four bat species were recorded in the study area - Big Brown Bat (*Eptesicus fuscus*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*) and Eastern Red Bat (*Lasiurus borealis*). Hoary Bat, Eastern Red Bat, and Silver-haired Bat are migratory bats that are listed as Endangered on the Species at Risk in Ontario list and protected by the ESA.

Snake Coverboard Surveys were also completed as part of the field investigations. The snake community survey followed methods outlined in the Survey Protocol for Ontario's Species at Risk Snakes (MNRF 2016) for artificial cover objects (ACO's) and visual encounter surveys for Butler's Garternsnake (*Thamnophis butleri*). Butler's Gartersnakes are known to inhabit old fields, disturbed sites, urban and industrial sites, and tallgrass prairie (COSEWIC 2010). Essential habitat components include a dense cover of grasses or herbs with a heavy thatch layer and an abundance of earthworms (COSEWIC 2010). Candidate habitat in the study area is primarily restricted to the meadows of the ROW linear hedgerows. This work was completed under a Wildlife Scientific Collectors Authorization (WSCA) that was issued on March 27, 2024. No Butler's Gartersnakes were observed while following the MNRF 2016 survey protocol, therefore the species is considered absent from the Highway 401 corridor. The proposed locations of the northern and southern off/on-ramp areas were not studied due to a lack of access, however there is a lack of suitable habitat (i.e., meadows, woodlot edges, wide hedgerows) in this area. In addition, Butler's Gartersnakes have a relatively small home range. For these reasons, this species is presumed absent from the study area.

There were 17 records of SAR and Species of Conservation Concern (SOCC) in the NHIC database that may occur within the study area. This includes six birds, seven mammals, two reptiles, and two plant species for the SAR. For the SOCC, seven birds, two reptiles, two insects, and five plant species were identified. The detailed findings of the background review are documented within the *Terrestrial Ecosystems Existing Conditions and Preliminary Impact Assessment Report* provided and a copy is on file with MTO.

Habitat assessments completed for the study area (in locations where access was made available to the Project Team) determined that three SAR have the potential to occur in the study area based on the presence of suitable habitat and current overlapping observation records. They include Eastern Red Bat, Hoary Bat, and the Silver Haired Bat. Remaining surveys will be completed and species confirmed during the Detail Design stage.

Vegetation Communities

The study area is primarily comprised of active agricultural lands of annual row crops, as well as dry and fresh meadows, thicket communities, deciduous and coniferous forests, and developed areas.

The developed portion of the study area was primarily composed of active agriculture along the ROW and rural residential properties.

The following is a floristic summary for the study area based on botanical assessments carried out in June and September 2024**:**

- There were 147 species of vascular plants recorded, which includes taxa identified to species, subspecies (ssp.) and variation (var.) levels.
- 78 of the 147-recorded species are native to Ontario, while 69 are exotic species not native to Ontario.
- 58 native species have a provincial rank of S5, which indicates that they are common with a secure population in Ontario.
- 15 native species have a provincial rank of S4, which indicates that they are uncommon to common, but not rare in the province and populations are apparently secure.
- One Special Concern species was observed – Climbing Prairie Rose (Rosa setigera, Special Concern).
- There were five native species that are provincially rare
- Two highly sensitive native plant species with a high coefficient of conservatism value of 8, 9 or 10 observed in the study area.

A detailed inventory of the vegetation communities observed within the study area at the time of the September 2024 field investigations are discussed within the *Terrestrial Ecosystems Existing Conditions Report* a copy is on file with MTO.

Rare Vegetation

There were five native species that are provincially rare (i.e., S1-S3) - Prairie Milkweed (Asclepias sullivantii, S2S3), Shellbark Hickory (Carya laciniosa, S3), Honey Locust (Gleditsia triacanthos, S2?), Climbing Prairie Rose (Rosa setigera, S2S3), and Missouri Ironweed (Vernonia missurica, S3?). The Honey Locust observed was planted and did not appear to be naturally occurring.

4.1.5.3 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) is defined as habitat that is ecologically important in terms of features, functions, representation or amount of contribution to the quality and diversity of an identifiable geographic area or Natural Heritage System, and is protected under the *Provincial Policy Statement*, 2024.

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather at one time of the year, or where several species congregate. Examples include deer yards, snake and bat hibernacula, waterfowl staging and molting areas, raptor roosts, bird nesting colonies, shorebird staging areas, and passerine migration concentrations. Only the best examples of these concentration areas are usually designated as SWH. Areas that support a Species at Risk, or areas where a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant.

There were no candidate seasonal concentration habitat areas identified within the study area during field investigations.

Rare Specialized Habitat

Rare or specialized habitats are two separate components of SWH. Rare habitats are those with vegetation communities that are considered rare in the province. Specialized habitats are microhabitats that are critical to some wildlife species such as habitat for area-sensitive species, forests providing a high diversity of habitats, amphibian woodland breeding ponds, turtle nesting habitat, highly diverse sites, seeps, and springs. High quality habitat features generally occur outside of the influence of edge effects and wildlife mortality that are associated with major roadways.

There were no candidate rare or specialized habitats identified within the study area.

Habitat for Species of Conservation Concern

Habitat for SOCC includes habitat for those species that are not covered under the ESA including species ranked as special concern and provincially ranked as S1-S3. Data from field surveys in the study area were used to assess the potential for habitat of SOCC to occur within the study area. Habitat assessments and targeted surveys for these species were completed through a combination of satellite photo interpretation and field investigations to determine whether suitable habitat may be present in the ROW.

The following candidate species of conservation concern habitats were identified within the study area:

- Documented: Terrestrial Crayfish chimneys
- Confirmed: Barn Swallow, Snapping Turtle, Monarch, Climbing Prairie Rose, Shellbark Hickory, Missouri Ironweed, Prairie Milkweed.
- Present: Potentially suitable habitat for Rusty Blackbird, Judith’s Underwing, Giant Ironweed, Shumard Oak.

Animal Movement Corridors

Migration corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements. There is one type of animal movement corridor in Ecoregion 7E: amphibian corridors. These corridors are identified after amphibian breeding habitat (woodlands) areas are confirmed. Amphibian

breeding surveys were not conducted for the Project and were beyond the scope of this assessment. The need for amphibian breeding surveys will be determined during Detail Design.

Migratory Birds

Cliff Swallow and Barn Swallow nests (as well as older, unidentified swallow nests) were observed on the underside of the Concession 8 (outside the study area), Concession 9, Concession 10/County Road 17, Concession 11, as well as the culvert associated with the Sullivan Creek Drain and another culvert in the western portion of the study area in June 2024. A Downy Woodpecker nest was also observed in a dead snag along Highway 401 in the THDM3 roadside community. All vegetated areas within the study area have the potential to provide nesting habitat for migratory birds.

4.1.5.4 Summary of Key Terrestrial Features

Detailed terrestrial studies have been conducted as part of this study to confirm information gathered from secondary sources. The main natural heritage features in the study area are included in Table 3. Further investigations will be completed and expanded upon during the Detail Design Stage.

Table 3: Summary of Natural Heritage Features for the Highway 401 and Lauzon Parkway Interchange Study Area

Type	Species/Feature	Description
Migratory Birds	Bird Nests	• May be present in vegetation within the study area and Work Zone. • Barn Swallow and Cliff Swallow nests were present in the study area within culverts and under overpasses associated with the 401.
Vegetation	Wetlands	• No aquatic feature (i.e., OAO) is present in proximity to the study area.
Significant Wildlife Habitat	Turtle nesting areas	• May be present within the study area. No natural habitat was observed, but turtles may nest in road shoulders. Road shoulders do not qualify as SWH.
	Bat maternity colonies	• Suitable forested habitat absent from study area (i.e., FOD, FOM, SWD, SWM). However, Suitable bat maternity roost trees were identified within the ROW
	Terrestrial Crayfish	• Seven observations of terrestrial crayfish burrows were observed throughout the study area in roadside ditches along Highway 401.
Species at Risk	Bats (Hoary Bat, Eastern Red Bat, and Silver-haired Bat).	• Confirmed by Acoustic Recording Units (ARU) recordings at 11 ARU Stations in the study area
Species of Conservation Concern	Birds (Barn Swallow) Insects (Monarch) Vascular Plants (Climbing Prairie Rose, Shellbark Hickory, Prairie Milkweed, Missouri Ironweed) Reptiles (Snapping Turtle)	• Barn Swallow was observed outside the study area during breeding bird surveys and nesting evidence was documented within a culvert under Highway 401. • Monarch and its habitat (i.e., milkweed) was documented in the study area. One Monarch was observed north of WC-6 and Highway 401 along a TAGM5 community in the center of the study area. Four patches of Prairie Milkweed were observed with 15 – 50 stems each along the west and east ends of the study area. • Climbing Prairie Rose was observed in three locations throughout the study area with an approximate total of six plants. • One Shellbark Hickory was observed north of WC-6 and Highway 401 in the center of the study area. • Missouri Ironweed was observed in four locations along Highway 401 throughout the study area, with patches ranging from 2 – 50 plants. • One Snapping Turtle was observed in the study area near Concession Road 9.

4.2 Socio-Economic Environment

4.2.1 Land Uses

The study area is located within the City of Windsor and Town of Tecumseh in Essex County from Concession Road 8 to Concession Road 11 along Highway 401. The immediate study area consists of agricultural land and some wooded areas. The study area includes residential homes primarily associated with farm properties on Concession 9 and Concession 10 in the study area on agricultural lands. Additionally, A settlement area is present at the west end of the study area at Concession 8 which includes industrial and commercial businesses. Natural areas are also within the study area such as the Little River and an associated tributary to Concession Road 9.

4.2.1.1 Official Plans

The Essex *County Official Plan* applies to the study area south of Highway 401 which is the boundary with the City of Windsor. Areas in this Official Plan are identified as “Agricultural” from Concession Road 9 to the east study area limit, and “Settlement Area” from Concession Road 9 to the western study area limit. The settlement area is further identified as a “Primary Settlement Area.” The study area is adjacent to designation “Future Employment Area” as per Schedule D Land Use of the *City of Windsor Official Plan* (CWOP, 2013). Section 6.13.4 of the Official Plan defines these areas for future Industrial and Business Park purposes. Although the land is currently under agricultural production, “Agricultural” land use designations within the City of Windsor are not present. The lands are intended to be farmed until the lands are taken up for development.

The study area is adjacent to designation “Business Park” as per Schedule B-2 Town of Tecumseh Official Plan Old Castle Hamlet Settlement Area Land Use Plan (*Town of Tecumseh Official Plan, 2021)*.

Other areas of the study area within the Town of Tecumseh are designated “Agricultural”, which aligns with the County definition where land uses are to be agricultural or for agricultural-related land uses.

There are no parcels of land that have been identified as Mineral Reserve, Aggregate Resource or Protected Areas in the study area.

4.2.2 Student Transportation/Education Facilities

The study area is within the Greater Essex County, Le Conseil Scolaire Catholique Providence, and the Windsor District School Boards. The study area is utilized year-round as access for students and/ or student transportation services requiring access to certain schools in the County. The school boards and transportation services were consulted as part of this study.

4.2.3 Emergency Services

Emergency Services consist of police, fire, and medical response providers. The following is the summary of emergency services within the study area:

- Police service in the study area is provided by the Ontario Provincial Police (OPP) and Windsor Police – Essex County Detachment (located on Manning Road south of Highway 401)
- Fire services are provided by the City of Windsor. The closest fire station to the study area is located in Windsor along Provincial Road.

4.2.4 Agriculture

Active agricultural land is present within the study area, much of which is designated as agricultural land under the Official Plan (OP). The lands are actively cultivated and primarily used for cash crop production. Typical crops grown in the area include winter wheat and corn.

4.3 Cultural Heritage Environment

4.3.1 Archaeological Resources

A *Stage 1 Archaeological Assessment* (under PIF # P256-0799-2024) of the study area was carried out in accordance with the *Standards and Guidelines for Consultant Archaeologists* (2011) and the *Ontario Heritage Act* (1990) to determine the potential for the presence of known and/or potential archaeological resources in the area based on a review of relevant background information and a site visit conducted on May 16, 2024. Based on the findings of the assessment, the following is noteworthy:

- The study area currently consists of agricultural lands, structures and maintained lawns
- The existing ROW has limited archaeological potential due to previous ground disturbances

The Stage 1 archaeological assessment determined that much of the study area, approximately 69.7% (112.6 ha), retains archaeological potential. In accordance with Section 1.3.1 and Section 7.7.4 of the MCM’s *2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), Stage 2 archaeological assessment is required for any portion* of the Project’s anticipated construction activities which impact an area of archaeological potential. The Stage 1 archaeological assessment determined that the remaining portions of the study area, approximately 30.3% (49.0 ha), retain low to no archaeological potential. In accordance with Section 1.3.2 and Section 7.74 of the MCM’s *2011 Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Stage 2 archaeological assessment is not required for any portion of the Project’s anticipated construction activities which impact an area of low to no archaeological potential. The Stage 1

report was entered into the MCM Ontario Public Register of Reports. The Stage 2 archaeological assessment will be completed during Detail Design.

4.4 Indigenous Communities

The following Indigenous communities/organizations are included on the project contact list as they may have a potential interest in the project study area:

- Walpole Island First Nation
- Oneida Nation of the Thames
- Caldwell First Nation
- Chippewas of Kettle and Stony Point First Nation
- Chippewas of the Thames First Nation
- Delaware Nation at Moraviantown
- Munsee-Delaware Nation
- Aamjiwaang First Nation

4.5 Transportation Conditions

This section of the report documents existing transportation conditions along Highway 401 within the study area.

4.5.1 Highway Classification

Highway 401 is classified as a west-east, six-lane, Rural Freeway Divided highway within the project limits.

4.5.2 Posted and Design Speed

The existing posted speed limit on Highway 401 is 110 km/h, and the design speed is 130 km/h Within the project limits. The posted speed drops to 100 km/h for the westbound traffic approximately 300 m ahead of Concession Road 9 underpass.

4.5.3 Cross-Section and Alignments

The cross-section characteristics of Highway 401 within the study limits are summarized in Table 4.

Table 4: Summary of Cross-Section Elements

Cross-Section Element	Width (m)
Lane Width	1 lane x 3.50, 2 lanes x 3.75
Shoulder Width	3.0 (median and outside)
Shoulder Rounding	1.0
Right-of-Way Width	Varies (Interchange)

The horizontal and vertical alignment of Highway 401 was reviewed to identify geometric deficiencies. There is one existing horizontal curve on Highway 401 within the project limits. The curve meets and exceeds the minimum radius requirements of R=950 m however it does not meet the desirable radius of R=2,300 m as per the *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads, October 2023*.

The existing profile of Highway 401 within the study area is generally flat with a maximum grade of 0.1%.

4.5.4 Intersections

There are no intersections within the study area.

4.5.5 Crossing Roads

There are two crossings of Highway 401 within the study area: Concession Road 9 and Concession Road 10/ County Road 17. The existing roads are posted 60 km/h with a design speed of 80 km/h.

The City of Windsor will undertake a separate study for the extension of Lauzon Parkway from County Road 42 to Highway 3, as a future condition. As the road is not currently present, it is not included as a crossing below.

The existing crossings are described in Table 5:

Table 5: Existing Crossings

Crossing Road	Structure Type	Posted Speed (km/h)	Design speed (km/h)
Concession Road 9	Underpass	60 km/h	80 km/h.
Concession Road 10/ County Road 17	Underpass	60 km/h	80 km/h.

The cross-section of each crossing road within the study limits are summarized in Table 6.

Table 6: Crossing Road – Cross-Section

Crossing Road	Approximate Lane Width	Approximate Shoulder Width
Concession Road 9	2 x 3.25	2.5
Concession Road 10/ County Road 17	2 x 3.25	3.0

4.5.6 Existing Structures

There are two bridges with the study area, associated with the crossing roads. There are also structural culverts within the study area. Table 7 summarizes bridge structures within the study limits:

Table 7: Bridge Structures within Study Limits

Structure ID	Name	Year Constructed
06X-0231/B0	Concession Road 9 Underpass	1967
06X-0239/B0	Concession Road 10 Underpass	1966

4.5.7 Existing Illumination

Within the study limits there is no existing illumination.

4.5.8 Existing Drainage

A *Drainage Report* has been completed as part of this study to assess existing drainage conditions and to develop a strategy for the Recommended Plan based on a desktop review of relevant information and field visit conducted during this study.

4.5.8.1 Culverts

There are three centreline culverts crossing Highway 401 near the proposed interchange. There are also three significant entrance culverts (box culverts) on Concession Road 9 and two (CSPs) on Concession Road 10 providing drainage for large external areas. In addition, there were several smaller (300 to 500 mm) entrance culverts providing local drainage on the Concession Roads.

4.5.8.2 Storm Sewers

Storm sewers on Highway 401 provide drainage for the median, generally outletting to the north (downstream) ditch every 300 to 400 m. The storm sewer outlets were generally in good condition but were obstructed by sediment build-up in the ditches.

A series of smaller, one or two pipe storm sewer systems provide drainage for Concession Roads 9 and 10 within the study limits (generally 1 or 2 catchbasin, 1 or 2 storm sewers, draining to the ditch).

4.5.8.3 Ditch Drainage

Ditches exist north and south of Highway 401 and east and west of Concession Roads 9 and 10 within the project limits. During the inspection, it was confirmed that these ditches are generally in fair condition. Some areas of ditching were found to have an excess build-up of sediment which has caused the outlets of some pipes to become blocked. The ditches around areas of buried pipes and blocked culverts and in areas of excessive ponding/sedimentation/vegetation are proposed to be cleaned out to promote positive drainage.

4.5.8.4 Other Drainage Infrastructure and Concerns

As part of the study, representatives from MTO, that are familiar with the study area, and local stakeholders were contacted to determine if there were any maintenance concerns regarding culverts within the study area.

At this time, no maintenance/drainage issues were brought forward to Stantec through the Public Consultation process.

There are several municipal drains that cross the highway as surface drains. There are no closed underground municipal drains, although private field tiles may be present in agricultural fields. Table 8 summarizes the location of all municipal drain crossings (both surface and subsurface) near the interchange, provides their location, and other relevant information.

Table 8: Municipal Drain Crossings

Municipal Drain	Road	Approximate Station Crossing	Comments
Hurley Relief Drain	Highway 401	14+800	Open drain, flows parallel to Highway 401 on north of highway, outlets to Little River
9th Concession Drain	Highway 401	15+450	Open drain, outlets to Little River

Municipal Drain	Road	Approximate Station Crossing	Comments
Little River Drain	Highway 401	16+150	Open drain, outlets to Little River
Watson Drain	Highway 401	16+800	Open drain, outlets to Little River
Mcarthy Drain	Highway 401	N/A	Open drain, flows parallel to Highway 401 from Station 16+850 to 17+900 south of the highway, outlets to Sullivan's Creek
Sullivan's Drain	Highway 401	17+900	Open drain, outlets to Sullivan's Creek

4.5.9 Traffic

A *Traffic Analysis Report* and *Safety Review of Existing Conditions Report* have been prepared as part of this study and are on file with MTO. The reports detail the existing traffic operations and collision statistics within the study area.

4.5.10 Traffic Volume Data

The Traffic Analysis Report established Highway 401 annual average daily traffic (AADT), the summer average daily traffic (SADT), the design hour volume (DHV), and the percentage of commercial vehicles (% Trucks). The historical traffic volume growth rates along Highway 401 were estimated based on the annual average daily traffic (AADT) ranging from 1988 to 2019, provided in the Provincial Highways Traffic Volumes 1988-2019 Report by MTO. Based on these estimates a low growth of 1% and a high growth of 3% was utilized for the calculation of future growth in the study area. The Highway 401 traffic volume projections were then utilized to determine traffic operations, as discussed in Section 4.5.12 below.

4.5.11 Traffic Operations

The operational efficiency of Highway 401 within the study area was determined for the existing conditions and given a Level of Service score.

The Level of Service (LOS) is a way to measure the free flow of traffic on a roadway and is used to determine how well a transportation facility is operating from a traveler's perspective. LOS is expressed in terms of traffic delays and is represented by letters A through F, whereby a LOS of A represents free-flow traffic conditions, and a LOS of F represents a breakdown in traffic flow with stop-and-go traffic conditions. The existing traffic within the study limits for the mainline Highway 401 analyzed and determined to operate at LOS A during the peak hours, ensuring smooth traffic flow with minimal delays.

4.5.12 Road Safety

Based on a review of collision history from January 2019 to December 2023 within the study area, there were a total of 95 collisions on Highway 401. On Highway 401 the predominant collision impact type was a single motor vehicle with 65 collisions (68%) followed by sideswipe with 15 collisions (16%), and rear end with 14 collisions (15%). Out of all of the collisions on Highway 401, 86 resulted in property damage, 7 in non-fatal injury and 2 fatal injury.

Most of the collisions occurred during daylight conditions as such, 60% (57 out of 95) occurred during daylight conditions and only 40% (38 out of 95) occurred at non-daylight conditions. The amount of collisions occurring at night was about 10% higher than the provincial average with 30% between 2019 and 2021. Winter related conditions represent approximately 31% of the total collisions (29 out of 95) within the study area. Which was 19% higher than the provincial average between 2019 and 2021 of 12%.

4.6 Utilities

Utility companies in the study area were requested to provide information on the location and type of existing utility plant. The following companies have their utilities present within the study area: Enbridge Gas, Hydro One, Bell and Cogeco.

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5.0 Generation and Evaluation of Design Alternatives

The purpose of this study was to identify and evaluate interchange design alternatives to address the current and future transportation needs in the study area.

5.1 Description of Long List of Design Alternatives

A list of interchange alternatives (and associated improvements) was developed. The alternatives included:

Interchange Alternatives:

- *Alternative 1 – Teardrop Interchange*
- *Alternative 2 – Parclo A4 Interchange*

Multi-Use Pathway (MUP) Alternatives:

- *Alternative 1 – Stand-alone Bridge over Highway 401*
- *Alternative 2 – MUP incorporated into ramps and new Lauzon Parkway bridge*
- *Alternative 3 – MUP on Concession Road 9 new bridge*

Preliminary Structure Alternatives – Concession Road 9:

- *Alternative 1 – Replace on Existing Alignment Concession Road 9 bridge - Closed with detour*
- *Alternative 2 – New Alignment East of Existing Bridge Concession Road 9 - Bridge Open with two Lanes*
- *Alternative 3 – New Alignment West of Existing Bridge Concession Road 9 - Bridge Open with two Lanes*
- *Alternative 4 - Permanent Full Closure of Concession Road 9*

Preliminary Structure Alternatives – Concession Road 10:

- *Alternative 1 – Replace on existing Alignment Bridge - Closed with detour*
- *Alternative 2 – New Alignment East of Existing Bridge Concession Road 10 - Bridge open with two lanes*
- *Alternative 3 – New Alignment West of Existing Bridge Concession Road 10 - Open with two Lanes during Construction*
- *Alternative 4 – Permanent Full Closure of Concession Road 10*

Interchange Alternatives

There were two alternatives considered for the new Highway 401 and Lauzon Parkway interchange. A teardrop roundabout interchange connecting north and south ramp terminals (see Figure 3) and a Parclo A-4 interchange with intersections at the north and south ramp terminals (see Figure 4).

Figure 3: Alternative 1 - Teardrop

Figure 4: Alternative 2 – Parclo A4

Multi-Use Pathway (MUP) Alternatives

There were three alternatives considered for the new multi-use pathway that runs parallel the proposed Lauzon Parkway and crosses Highway 401. Alternative 1 comprises of a stand-alone bridge where the MUP runs along the Lauzon Parkway then diverges to the west from Lauzon Parkway and crosses over Highway 401 using a bridge then runs along the W-N/S Ramp and joins back with Lauzon Parkway to the south (see Figure 5). Alternative 2 runs parallel to Lauzon Parkway the full length, however it crosses three interchange ramps in the process (see Figure 6). Alternative 3, same as Alternative 1 runs along the Lauzon Parkway then diverges to the west from Lauzon Parkway and crosses over Highway 401 using the Concession Road 9 new bridge. It then goes back to the east and runs along the W-N/S Ramp joining back with Lauzon Parkway (see Figure 7).

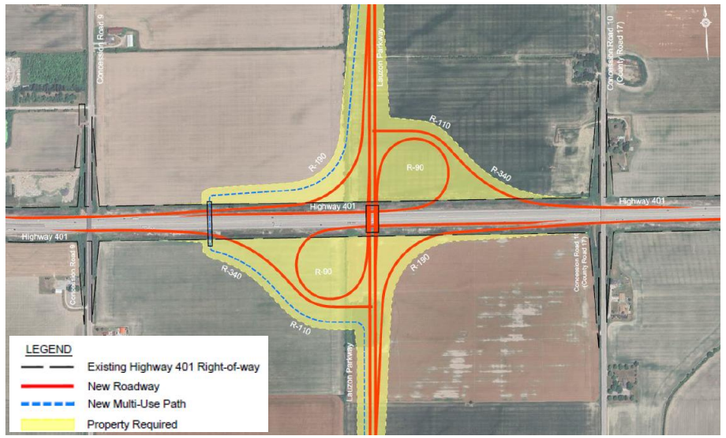

Figure 5: Alternative 1 – Stand-alone Bridge over Highway 401

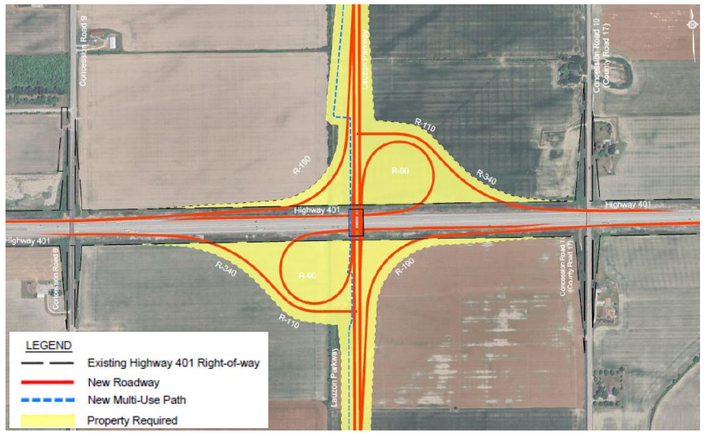

Figure 6: Alternative 2 - MUP Incorporated into Ramps and New Lauzon Parkway Bridge

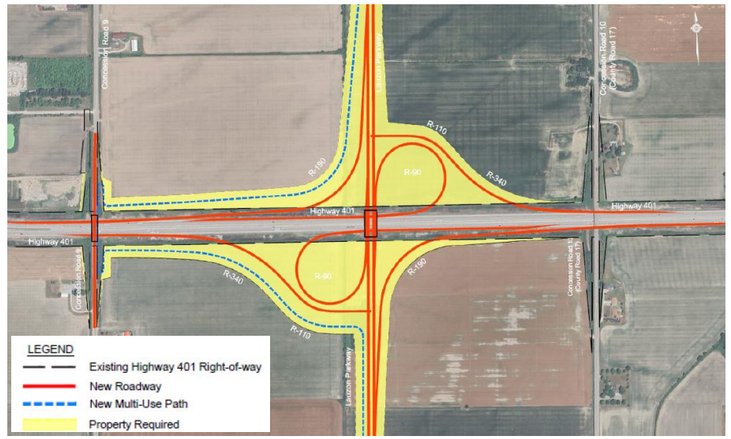

Figure 7: Alternative 3 – MUP on Concession Road 9 New Bridge

Preliminary Structure Alternatives – Concession Road 9

A set of structural replacement alternatives were developed and presented to the public at the Public Information Centre. There were four structural replacement alternatives developed and evaluated for Concession Road 9. Alternative 1 includes removing the existing Concession Road 9 structure and replacing it with a new structure on the existing alignment. Alternative 2 includes removing the existing Concession Road 9 structure and replacing it with a new structure to the east of the existing alignment. Alternative 3 includes removing the existing Concession Road 9 structure and replacing it with a new structure to the west of the existing alignment. Alternative 4 includes removing the existing structure and closing the crossing and adding two cul-de-sacs at the Concession Road 9 terminus at Highway 401.

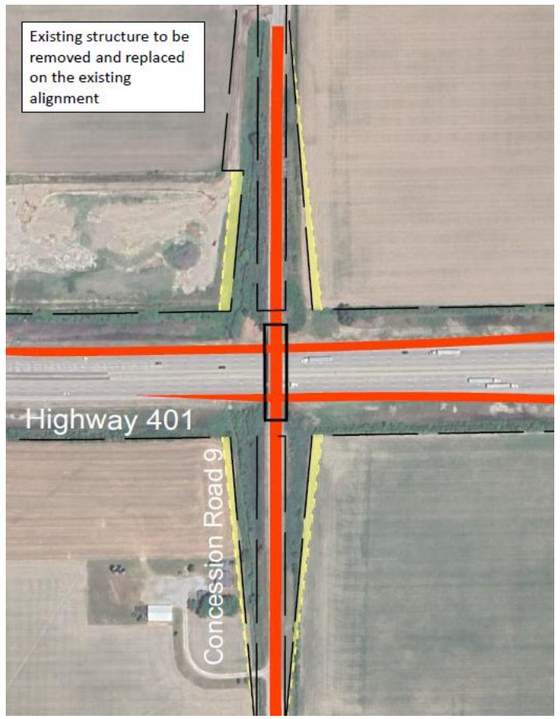

Figure 8: Alternative 1 – Replace on Existing Alignment. Bridge closed with detour

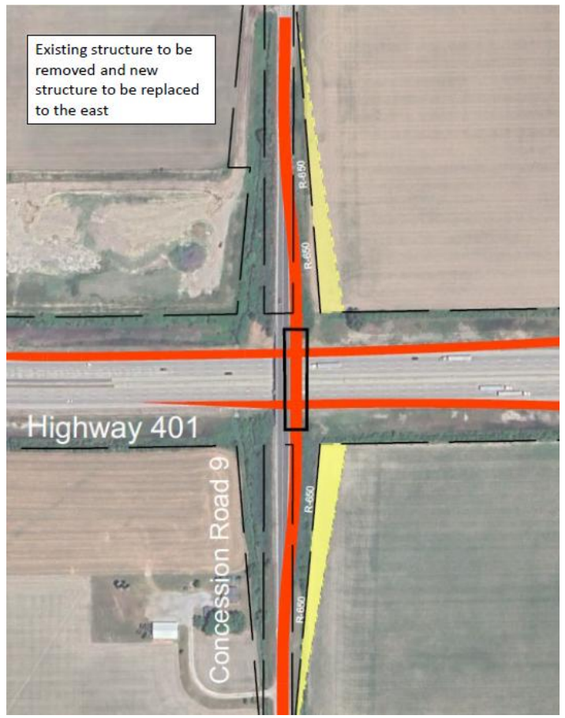

Figure 9: Alternative 2 – East Bridge. Open with two lanes

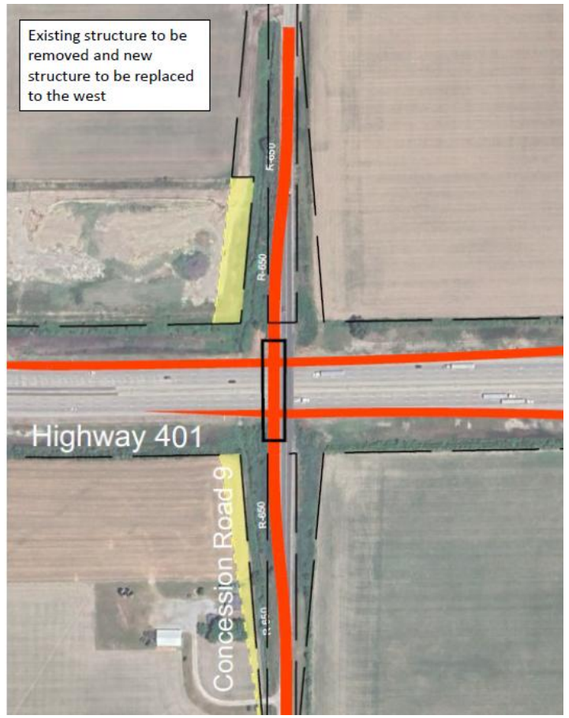

Figure 10: Alternative 3 – West Bridge. Opens with two lanes

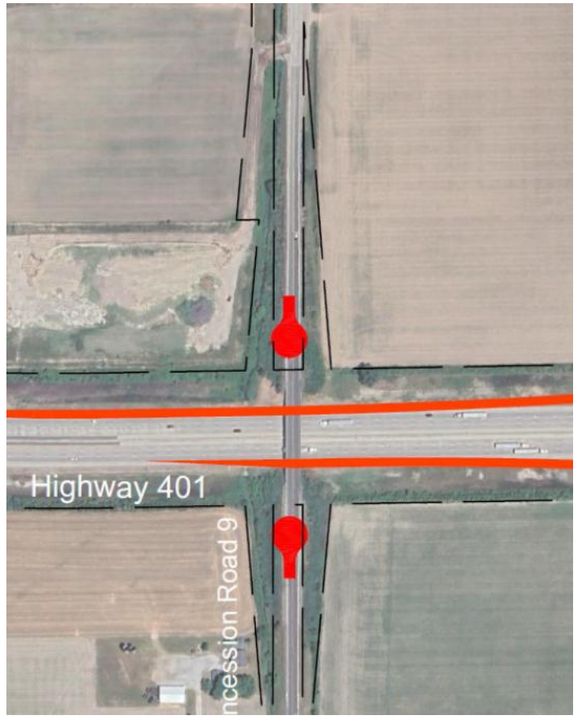

Figure 11: Alternative 4 – Full Closure of Concession Road 9

**Property shown is representative of the embankments only at the time of the Public Information Centre, and does not include other roadway features or integration with the Multi-Use pathway. Refinements to the Concession Road 9 structure are shown on the Recommended Plan.*

LEGEND
- Existing Highway 401 Right-of-way
- New Roadway
- Property Required

Preliminary Structure Alternatives – Concession Road 10

There were four structural replacement alternatives developed and evaluated for Concession Road 10. Alternative 1 includes removing the existing Concession Road 10 structure and replacing it with a new structure on the existing alignment. Alternative 2 includes removing the existing Concession Road 10 structure and replacing it with a new structure to the east of the existing alignment. Alternative 3 includes removing the existing Concession Road 10 structure and replacing it with a new structure to the west of the existing alignment. Alternative 4 includes removing the existing structure and closing the crossing and adding two cul-de-sacs at the Concession Road 10 terminus at Highway 401.

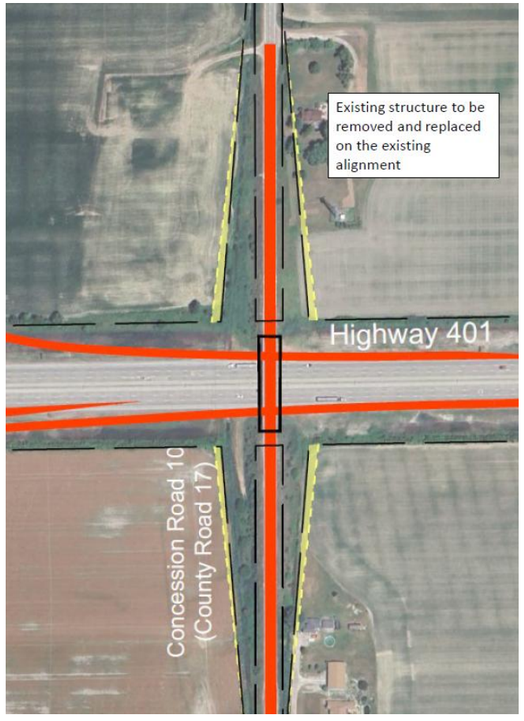

Figure 12: Alternative 1 – Replace on existing Alignment Bridge closed with detour

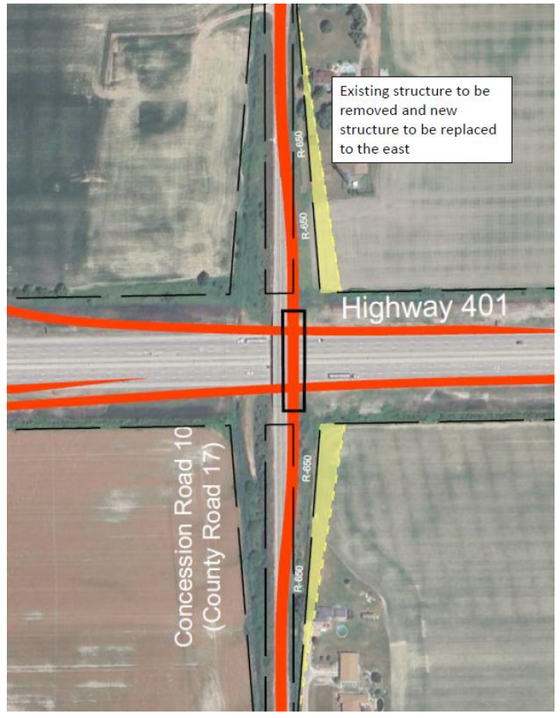

Figure 13: Alternative 2 – East Bridge. Open with two lanes

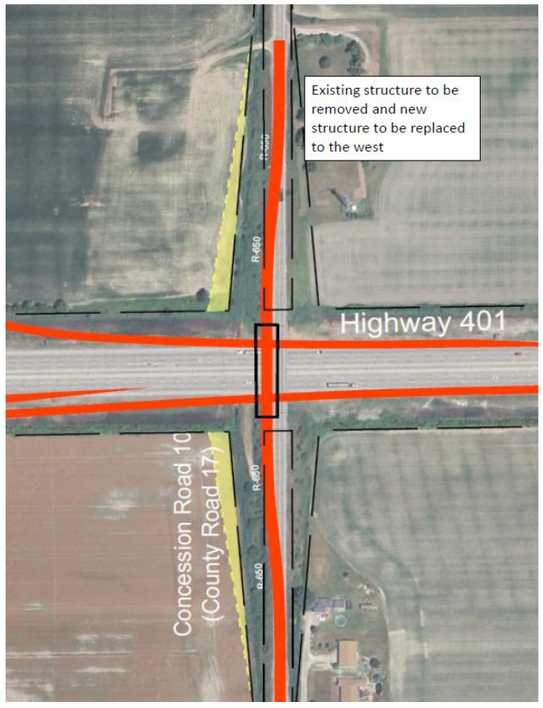

Figure 14: Alternative 3 – West Bridge. Open with two lanes

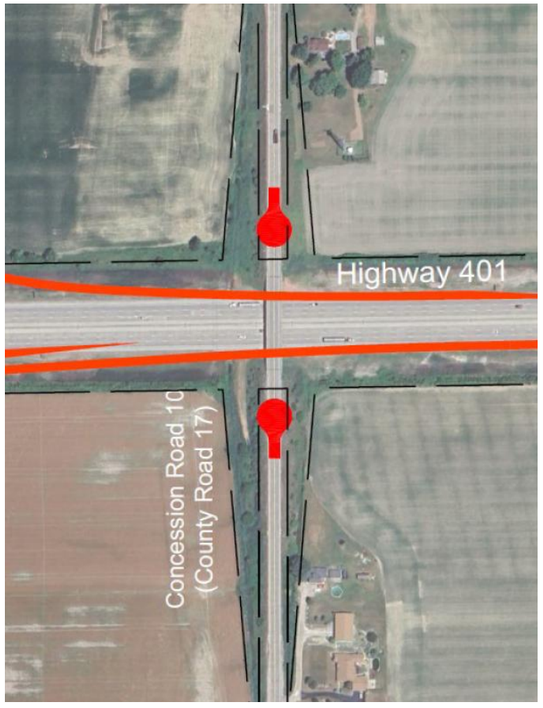

Figure 15: Alternative 4 – Permanent Full Closure of Concession Road 10

**Property shown is representative of the embankments only at the time of the Public Information Centre, and does not include other roadway features or integration with the Multi-Use pathway.*

LEGEND
- Existing Highway 401 Right-of-way
- New Roadway
- Property Required

5.2 Evaluation of Design Alternatives

5.2.1 Evaluation Criteria

In accordance with the MTO *Class EA for Provincial Transportation Facilities* and Municipal Expressways (2024), a wide range of potential impacts to the natural, social, cultural environments in the study area are to be considered in the development and evaluation of design alternatives.

The preliminary evaluation criteria were provided for public review and feedback as part of PIC . The evaluation process considered a range of engineering and environmental (natural, socio-economic and cultural) factors in the study area. Alternatives were evaluated using a comparative analysis based on the evaluation criteria to consider the advantages and disadvantages of each alternative. The evaluation process provides an objective approach to the analysis and evaluation of each alternative. Each alternative was ranked to provide an overall recommendation (Most Preferred, Moderately Preferred, Least Preferred). This was the basis for identifying the Preferred Plan. Once a Preferred Plan is selected, refinements may be made to the design.

Table 9 identifies the evaluation criteria for this study including the factors considered for each criterion, and the methodology and measurement for the scoring of each factor.

Table 9: Evaluation Criteria

Category	Criteria	Measures
Highway Engineering	**Traffic Operations**	Level of Service (LOS) – Highway 401.
		Level of Service (LOS) – Ramp terminals.
		Level of Service (LOS) – Lauzon Parkway.
	Geometrics and Safety	Collisions.
		Accommodates large agricultural vehicles.
		Accommodates active transportation.
		Ramp radii.
		Crossing road alignment.
		Crossing road grade at ramp terminal.
	Constructability	Complexity of staging and detours.
	Utilities	Length of impacts to utilities.
	Total Cost	Construction cost.
Socio-Economic Environment	**Property**	Approximate area of impact to existing and future land uses.
		Approximate number of private properties potentially impacted by construction activities.
	Business Operations/Viability	Number of businesses directly impacted (i.e., access to/from commercial property or landscaped areas) or displaced.
	Noise	Relative potential change in traffic noise levels on surrounding residential dwellings.
	Air Quality	Relative potential to affect air quality.
	Contamination	Potential to encounter contaminated soils/groundwater.
	Stormwater	Total additional impervious area requiring stormwater management strategies/facilities.
Cultural Environmental	**Cultural Heritage Resources**	Conserves built heritage resources and cultural heritage landscapes. Minimize potential impact on known (i.e., previously recognized) and potential built heritage resources and cultural heritage landscape.
	Archaeological Resources	Conserves archaeological resources. Minimize potential impact to archaeology sites and areas of archaeological potential.
Natural Environment	**Terrestrial Ecosystem**	Area of impact to wildlife habitat.
		Area of impacts to vegetated areas due to construction.
	Species of Conservation Concern, Species at Risk	Area impacts to potential species at risk habitat.
	Fish and Fish Habitat	Number of watercourse crossings. Impacts to fish habitat.

Table 10: Evaluation of Highway 401 and Lauzon Parkway Interchange Alternatives

Criteria	Measures	Alternative 1: Teardrop Roundabout Interchange	Alternative 2: Parclo A-4 Interchange
Highway Engineering Technical Environment			
Traffic Operations	Level of Service (LOS) Highway 401	• Similar traffic capacity as other alternatives	• Similar traffic capacity as other alternatives
			
	Level of Service (LOS) Lauzon Parkway (future)	• Lower traffic capacity compared to Alternative 2 • Less capacity at the ramp terminals due to heavy traffic on Lauzon Pkwy and limited gaps for traffic to access Lauzon Pkwy	• Higher traffic capacity compared to Alternative 1
			
Geometrics & Safety	Collisions	• Roundabouts provide some reduced severity of vehicle collisions due to decreased amount of conflict points compared to intersections. Additionally, there are also less opportunities for head on or T-type collisions compared to signalized or stop-sign intersections • Pedestrians and cyclists may find crossing less ideal than other options	• More potential for collisions due to increased number of conflict points when compared to roundabouts • Opportunity for pedestrian safety measures such as crosswalks at intersections
			
	Accommodates Long Combination Vehicles (LCVs)	• Lower ability to accommodate LCVs with modifications • Lower ability to accommodate agricultural vehicles with modifications	• Greater ability to accommodate LCVs with modifications • Ability to accommodate large agricultural vehicles
			
	Accommodates active transportation	• Can accommodate a separate multi-use trail crossing of Highway 401 that can be provided in the vicinity of the interchange • Can accommodate a multi-use trail on the main Lauzon Parkway structure (wider structure). Pedestrians and cyclists may find crossing less ideal than other options, additionally since the roundabout is located in the rural area with less	• Can accommodate a separate multi-use trail crossing of Highway 401 that can be provided in the vicinity of the interchange • Can accommodate a multi-use trail on the main Lauzon Parkway structure (wider structure). Opportunity for pedestrian safety measures such as crosswalks at signalized intersections

Criteria	Measures	Alternative 1: Teardrop Roundabout Interchange	Alternative 2: Parclo A-4 Interchange
		pedestrian and bicycle traffic, the drivers may pay less attention to pedestrians and bicyclists crossing the road than other options	
			
	Interchange spacing	• Similar as other alternatives. Situated between Manning and Concession 11/County Road 43 • No shared speed-change lanes required	• Similar as other alternatives. Situated between Manning and Concession 11/County Road 43 • No shared speed-change lanes required
			
	Ramp geometry	• Outer Loop Ramps (W-N/S and E-N/S): R=340m meets the desirable radius standard for DS=90km/hr • Outer Ramps (N/S-W and S/N-E): R=190m meets the desirable radius standard for DS=70km/hr	• Inner Loop Ramps (S-W and N-E): R=90m meets minimum radius standard for DS=50km/hr • Outer Loop Ramps (W-N/S and E-N/S): R=340m meets the desirable radius standard for DS=90km/hr • Outer Ramps (N-W and S-E): R=190m meets the desirable radius standard for DS=70km/hr
			
	Compatibility with nearby Underpass bridges and crossing road alignment	• Impacts to existing bridge piers at Concession 9 and 10 bridges if standard shoulders are placed • Crash protection required at the bridge piers for the outside shoulders of the ramps • Close proximity of the bridge piers will result in substandard outside shoulders	• Impacts to existing bridge piers at Concession 9 and 10 bridges if standard shoulders are placed • Crash protection required at the bridge piers for the outside shoulders of the ramps • Close proximity of the bridge piers will result in substandard outside shoulders
			
	Grade/ Profile Changes at intersection terminals/roundabouts	• Roundabouts generally require flatter grade to reduce the risk of overturning vehicles, therefore there will be higher amount of earth fill required to implement the roundabout platform at both ramp terminals	• Footprint of intersection at ramp terminals are smaller than roundabouts, reducing the amount of earth fill required
			

Criteria	Measures	Alternative 1: Teardrop Roundabout Interchange	Alternative 2: Parclo A-4 Interchange
Constructability	Complexity of staging and detours	• Moderate complexity of traffic staging • Impacts to Concession Rd 9 and 10 bridges will lengthen the overall construction schedule and increase local traffic impacts • Requires short duration full closure of Highway 401 to install girders for new structure	• Moderate complexity of traffic staging • Impacts to Concession Rd 9 and 10 bridges will lengthen the overall construction schedule and increase local traffic impacts • Requires short duration full closure of Highway 401 to install girders for new structure
			
Utilities	Number of impacts to utilities	• Telephone/Cable (Bell), electricity (Hydro One) and natural gas (Union Gas/Enbridge) services are present for residents and businesses on Concession Road 9, Concession Road 10/County Road 17 • Bell: One (1) potential conflict location; existing underground line located along the MTO ROW on the north side	• Telephone/Cable (Bell), electricity (Hydro One) and natural gas (Union Gas/Enbridge) services are present for residents and businesses on Concession Road 9, Concession Road 10/County Road 17 • Bell: One (1) potential conflict location; existing underground line located along the MTO ROW on the north side
			
Total Cost	Construction cost	• Higher anticipated overall cost than Alternative 2 (additional throw-away costs to transition to ultimate interchange configuration) • Lower anticipated initial construction cost for interim configuration only	• Higher anticipated construction cost than Alternative 1 due to additional interchange ramps • Interchange constructed as ultimate configuration and ramp tie-ins to existing Highway 401 lanes • Minimal additional throw-away costs when Highway 401 is widened for ultimate configuration
			
Socio-Cultural Environment			
Property	Approximate number of private properties potentially impacted by construction activities.	• Direct property impacts to 4 properties for the interchange, however additional property associated with the Concession Road 9 bridge and integration with the Multi-Use Pathway would be confirmed in detailed design • Slightly greater property requirements compared to Alternative 2 to accommodate the grading and profile for the roundabouts	• Direct property impacts to 4 properties, however additional property associated with the Concession Road 9 bridge and integration with the Multi-Use Pathway would be confirmed in detailed design • Least amount of property area required
			

Criteria	Measures	Alternative 1: Teardrop Roundabout Interchange	Alternative 2: Parclo A-4 Interchange
Business Operations/Viability	Number of businesses directly impacted (i.e., access to/from commercial property or landscaped areas) or displaced.	• No significant changes between both alternatives • No businesses anticipated to be directly impacted • Reduced farm footprint results in a loss of agricultural output	• No significant changes between both alternatives • No businesses anticipated to be directly impacted • Reduced farm footprint results in a loss of agricultural output
			
Noise	Relative potential change in traffic noise levels on surrounding residential dwellings.	• Similar distance to nearby sensitive receptors as Alternative 2 • Some impacts may be mitigated by noise barrier design, if warranted and feasible	• Similar distance to nearby sensitive receptors as Alternative 1 • Some impacts may be mitigated by noise barrier design, if warranted and feasible
			
Air Quality	Relative potential to affect air quality.	• Lower potential to impact local air quality due to reduced idling at roundabouts when compared to Alternative 2 • Standard construction mitigation will be applied	• Slightly higher potential to impact local air quality due to idling at signalized intersection when compared to Alternative 1 • Standard construction mitigation will be applied
			
Contamination	Potential to encounter contaminated soils/groundwater.	• No significant difference between alternatives • Additional environmental site assessment activities required to confirm presence of subsurface contamination, if any • All excess materials generated during construction will be managed in accordance with MECP regulations	• No significant difference between alternatives • Additional environmental site assessment activities required to confirm presence of subsurface contamination, if any • All excess materials generated during construction will be managed in accordance with MECP regulations
			
Stormwater	Total additional impervious area requiring stormwater management strategies/facilities.	• Smaller additional impervious area requiring stormwater management strategies/facilities	• Larger additional impervious area requiring stormwater management strategies/facilities
			

Criteria	Measures	Alternative 1: Teardrop Roundabout Interchange	Alternative 2: Parclo A-4 Interchange
Socio-Cultural Environment			
Cultural Heritage Resources	Conserves built heritage resources and cultural heritage landscapes. Minimize potential impact on known (e.g., previously recognized) and potential built heritage resources and cultural heritage landscape.	• Limited potential to impact built heritage structures in the Cultural Heritage Assessment Report from the Lauzon Parkway ESR (CHAR 2013) as all construction is ~350 m from the nearest structure and beyond typical vibration impact setbacks (50 m) • CHAR 2013 noted the following near the study area: – Potential Cultural Heritage Resources - Township survey (Township of Sandwich South), 5176 & 5184 County Road 17, 5201 County Road 17 – Built Heritage Resources - 4601 County Road 17 bungalow, 4876 County Road 17 (former farm complex), County Road 17 Underpass, Highway 401, 4948 County Road 17 • No cultural heritage mitigation was proposed in the 2013 report, and no work will occur within 350 m of these structures, although this should be confirmed in Detail Design	• Limited potential to impact built heritage structures in the Cultural Heritage Assessment Report from the Lauzon Parkway ESR (CHAR 2013) as all construction is ~350 m from the nearest structure and beyond typical vibration impact setbacks (50 m) • CHAR 2013 noted the following near the study area: – Potential Cultural Heritage Resources - Township survey (Township of Sandwich South), 5176 & 5184 County Road 17, 5201 County Road 17 – Built Heritage Resources - 4601 County Road 17 bungalow, 4876 County Road 17 (former farm complex), County Road 17 Underpass, Highway 401, 4948 County Road 17 • No cultural heritage mitigation was proposed in the 2013 report, and no work will occur within 350 m of these structures, although this should be confirmed in Detail Design
			
Archaeological Resources	Conserves archaeological resources. Minimize potential impact to archaeology sites and areas of archaeological potential.	• Larger footprint of potential impacts when compared to Alternative 2 • Additional archaeological assessment (AA) activities required to confirm impacts	• Smaller footprint of potential impacts when compared to Alternative 1 • Additional archaeological assessment (AA) activities required to confirm impacts
			
Natural Environment			
Terrestrial Ecosystem	Area of impacts to vegetated areas and wildlife habitat due to construction	• Larger footprint of potential impacts due to grading requirements when compared to Alternative 2 • Similar impacts to natural features and most of the study area agricultural land modified by farming	• Smaller footprint of potential impacts due to grading requirements when compared to Alternative 1 • Similar impacts to natural features and most of the study area agricultural land modified by farming
			

Criteria	Measures	Alternative 1: Teardrop Roundabout Interchange	Alternative 2: Parclo A-4 Interchange
Species of Conservation Concern, Species at Risk	Area impacts to potential SAR habitat	• Larger footprint of potential impacts due to grading requirements when compared to Alternative 2 • Potential habitat may be present for migratory birds, bats, amphibians, and reptiles	• Smaller footprint of potential impacts due to grading requirements when compared to Alternative 1 • Potential habitat may be present for migratory birds, bats, amphibians, and reptiles
			
Fish Habitat	Number of watercourse crossings, Impacts to fish habitat.	• No significant difference between alternatives • Little River and other municipal drains impacted • A small section of the Little River Drain channel is within the footprint and would require new culverts and extensions • Alternative may require the relocation of Little River, requiring a DFO Request for Review • 3 crossing points (ramps) • A farm drainage pond impacted by the roundabout on the south side of Highway 401	• No significant difference between alternatives • Little River and other municipal drains impacted • A small section of the Little River Drain channel is within the footprint and would require new culverts and extensions • Alternative may require the relocation of Little River, requiring a DFO Request for Review • 4 crossing points (ramps) • A farm drainage pond impacted on the south side of Highway 401
			
Overall Summary			

Legend

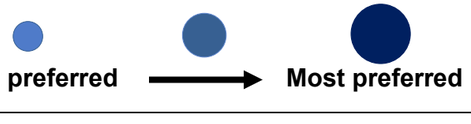

Table 11: Multi-Use Pathway Alternatives

Multi-use Pathway Alternatives			
Criteria	**Alternative 1: Stand-alone Bridge over Highway 401**	**Alternative 2: MUP incorporated into ramps and new Lauzon Parkway bridge**	**Alternative 3: MUP on Concession Road 9 new bridge**
Highway Engineering	Least Preferred	Least Preferred	Most Preferred
Natural Environment	Moderately Preferred	Moderately Preferred	Least Preferred
Socio-Cultural Environment	Moderately Preferred	Least Preferred	Moderately Preferred
			Preferred

Table 12: Structure Alternatives Concession Road 9

Structure Alternatives Concession Road 9				
Advantages/Disadvantages	**Replace on Existing Alignment - Bridge closed with detour**	**New Alignment-East Bridge open with two lanes**	**New Alignment – West Bridge open with two lanes**	**Permanent Full Closure of Concession Road 9**
Advantages	• Concession Road 9 can accommodate access across Highway 401 for agricultural operations and a future Multi-Use Pathway • Retains existing alignment • Faster construction duration • Lower construction cost compared to Alternatives 2 and 3 • Fewer property impacts compared to Alternatives 2 and 3	• Maintains access across Highway 401 • Similar construction duration and staging cost as closing the bridge • Same utility impacts as Alternative 1	• Maintains access across Highway 401 • Similar construction duration and staging cost as closing the bridge	• No maintenance costs with maintaining existing structure • Lower up-front costs as no new construction required • Fewest property or utility impacts compared to Alternatives 1, 2 and 3
Disadvantages	• Detour of local traffic on Concession Road 9 required for single construction season	• Requires alignment shift and more property compared to Alternative 1 • Significantly higher cost compared to replacing on existing alignment	• Requires alignment shift and more property compared to Alternative 1 • Greater potential utility impacts compared to Alternatives 1 and 2 (utility poles on the west side) • Significantly higher cost compared to replacing on existing alignment	• Traffic from Concession Road 9 will need to be redirected to the new Lauzon Parkway crossing and the adjacent Concession 8 crossing • Cannot accommodate a future Multi-Use Pathway
	Preferred			

Table 13: Structure Alternatives Concession Road 10

Structure Alternatives Concession Road 10				
Advantages/Disadvantages	**Replace on Existing Alignment - Bridge closed with detour**	**New Alignment-East Bridge open with two lanes**	**New Alignment – West Bridge open with two lanes**	**Permanent Full Closure of Concession Road 10**
Advantages	• Concession Road 10 can accommodate access across Highway 401 for agricultural operations and a future Multi-Use Pathway • Retains existing alignment • Faster construction duration • Lower construction cost compared to Alternatives 2 and 3 • Fewer property impacts compared to Alternatives 2 and 3	• Maintains access across Highway 401 • Similar construction duration and staging cost as closing the bridge • Same utility impacts as Alternative 1	• Maintains access across Highway 401 • Similar construction duration and staging cost as closing the bridge	• No maintenance costs with maintaining existing structure • Lower up-front costs as no new construction required • Fewest property or utility impacts compared to Alternatives 1, 2 and 3
Disadvantages	• Detour of local traffic on Concession Road 10 required for single construction season	• Requires alignment shift and more property compared to Alternatives 1 and 4 • Alignment is in closer proximity to two residential buildings • Higher cost compared to replacing on existing alignment	• Requires alignment shift and more property compared to Alternative 1 • Greater utility impacts compared to Alternatives 1, 2 and 4 (utility poles are on the west side) • Culvert and trees located near the west side embankment may be impacted • Higher cost compared to replacing on existing alignment	• Traffic from Concession Road 10 will need to be redirected to the new Lauzon Parkway crossing and the adjacent Concession 11 crossing
				Preferred

6.0 Recommended Plan

This section of the report describes the Recommended Plan for the new Highway 401 and Lauzon Parkway interchange.

The Recommended Plan includes a new Parclo A-4 interchange to connect to the future Lauzon Parkway extension. It also includes the replacement of the Concession Road 9 bridge structure with a new structure that includes a Multi-Use Pathway on the new structure, and closure of Concession Road 10/County Road 17 with a cul-de-sac on both sides of Highway 401.

Plans that illustrate details of the Recommended Plan are provided in Appendix D.

6.1 Classification and Speed Designations

Highway 401 within the study area is classified as a six-lane Rural Freeway Divided highway. The posted speed limit on Highway 401 is 110 km/h and the design speed is 130 km/h.

Lauzon Parkway within the study area is a future four-lane divided road that is proposed to be extended from County Road 42 to Highway 3, as identified in the 2015 Municipal Class Environmental Assessment by the City of Windsor. Lauzon Parkway outside of the interchange study area will be constructed by others at a future date.

6.2 Highway 401

Highway 401 within the study area will remain a six-lane Rural Freeway Divided highway, with three lanes in each direction. Existing through lanes will remain following construction. Speed change lanes will be added to accommodate the new interchange ramps.

6.2.1 Horizontal Alignment

6.2.1.1 Horizontal Curves

The minimum design radius for horizontal curves with 6% superelevation rate and a design speed of 130 km/h is R=950 m and desirable horizontal curve is R=2,300 m as identified in the *Chapter 3 – Alignment and Lane Configuration – TAC, Geometric Design Guide for Canadian Roads* (June 2017) and the *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads, October 2023*.

The horizontal alignment of Highway 401 will be kept as is.

6.2.2 Vertical Alignment

6.2.2.1 Vertical Curves

The minimum K-values to provide the minimum stopping sight distance of 305 m on vertical curves for freeways and divided highways with a design speed of 130 km/h are: crest curve K-150 and sag curve K-80, as identified in the *Chapter 3 – Alignment and Lane Configuration – TAC, Geometric Design Guide for Canadian Roads* (June 2017) and the *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads, October 2023*.

The existing profile of Highway 401 within the project limits is generally flat and there are no vertical curves.

6.2.2.2 Profile Grades

The maximum profile grade for a roadway with a design speed of 130 km/h is 3%. The existing Highway 401 profile within the project limits is generally flat and has a maximum grade of 0.1%.

6.2.3 Cross-Section

Highway 401 cross-section will be kept as is with 3.5 m inner lane and 3.75 m outer through lane. At the new interchange, the Highway 401 platform will be widened to accommodate the new 3.5 m speed change lanes for the on and off ramps as shown in Figure 16.

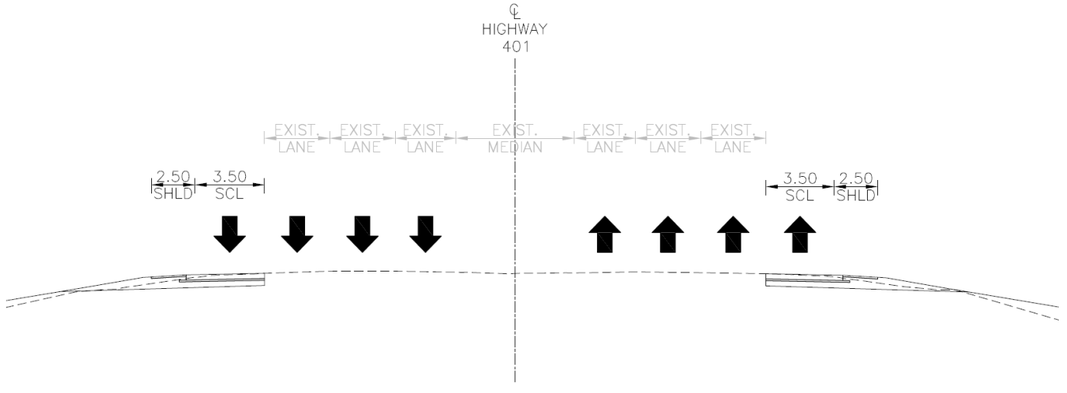

Figure 16: Highway 401 Cross-Section Widening at the Speed Change Lanes

The cross-section elements of Highway 401 within the project limits are summarized in Table 14.

Table 14: Summary of Recommended Cross-Section Elements on Highway 401

Cross-Section Element	Width (m)
Lane Width	1 lane x 3.50, 2 lanes x 3.75
Shoulder Width	3.0
Shoulder Rounding	1.5
Median Width	6.8

6.3 Lauzon Parkway

The Recommended Plan and Design Criteria from the Lauzon Parkway Improvements Class EA Study Environmental Study Report show 4 x 3.75 m lanes and 1.0 m flush median on the south side of the interchange, 4 x 3.75 m lanes and 2.0 m raised median between the ramp terminals and 4 x 3.65 m lanes and 6.0 m raised median on the north side of the interchange.

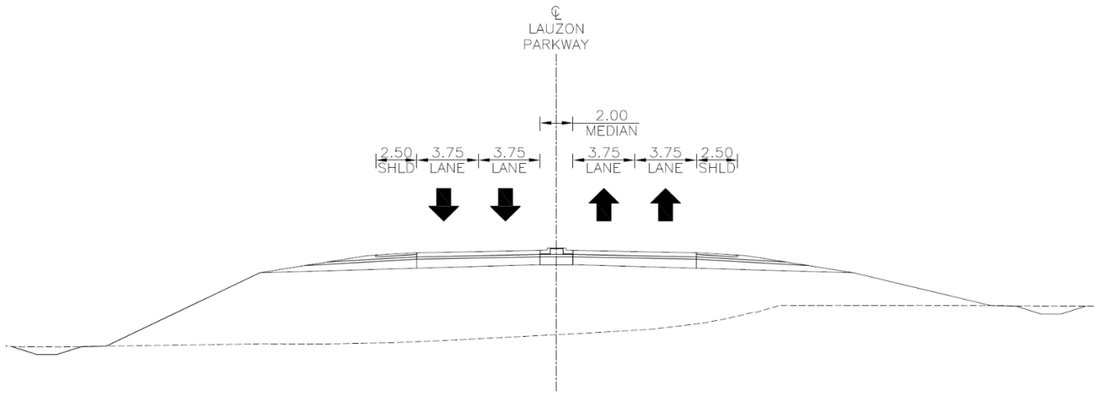

Figure 17: Lauzon Parkway Cross-Section

6.4 Highway 401 and Lauzon Parkway Interchange

To accommodate the future footprint of Lauzon Parkway and land development in the area, a new interchange at Highway 401 and Lauzon Parkway has been identified as part of the Recommended Plan.

A Parclo A-4 configuration interchange is recommended for the new interchange at Highway 401 and Lauzon Parkway. Concession Road 10/County Road 17 will be closed with a cul-de-sac on both sides of Highway 401, whereas Concession Road 9 will remain open. The new interchange ramps will include two off-ramps W-N/S and E-N/S and four on-ramps N-W, S-E, N-E, and S-W.

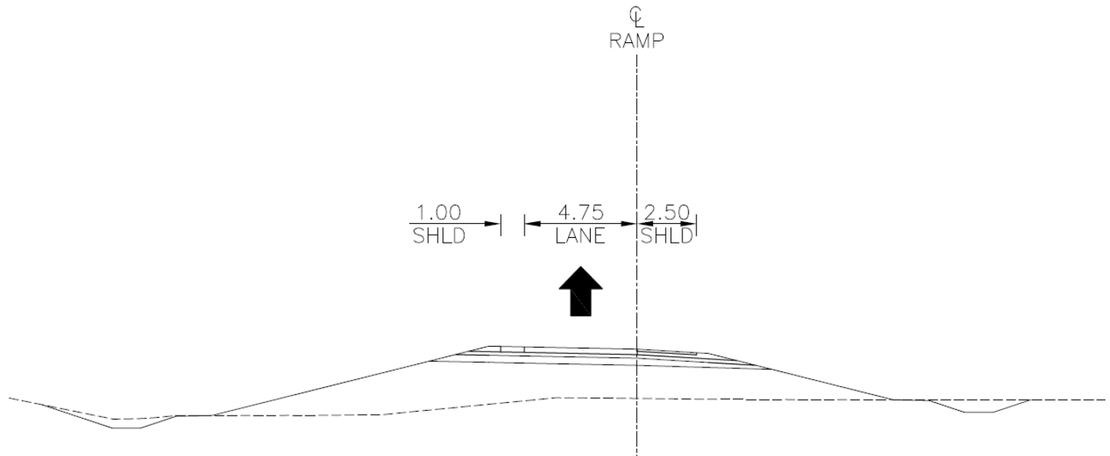

Figure 18: Interchange Ramp Cross-Section

The four new on-ramps S-E, S-W, N-W and N-E will be single lane 4.75 m in width. The E-N/S and W-N/S Ramps will be single 4.75 m lane exit ramps. The W-N/S Ramp will have a 3.75 m left-turn lane and a 3.75 m right-turn lane at a signalized intersection whereas the E-N/S Ramp will be unsignalized with a single lane at 4.75 m. All ramps will include a 2.5 m fully paved right shoulder, 1.0 m fully paved left shoulder, and 1.0 m shoulder rounding.

6.4.1 Traffic Operations

The operational efficiency of Highway 401, Lauzon Parkway and interchange ramps was evaluated for the interim (2035) and the ultimate (2045) horizon years.

For the interim and ultimate horizon years, the Highway 401 mainline operations are expected to operate at LOS A during the peak hours, ensuring smooth traffic flow with minimal delays. During the analysis there were no major weaving/merging conditions identified as a result of Lauzon Parkway interchange. For the interim year of 2035 and ultimate year of 2045 Lauzon Parkway interchange north ramp terminal is set to perform at a LOS A, respectively. However, the south ramp terminal is set to perform at a LOS B for all traffic movements except left turn movement which performs at a LOS C for the years 2035 and 2045.

During the investigation it was found that traffic signals were warranted at the south ramp terminal due to high traffic demand, while no traffic signals were warranted at the north ramp terminal.

6.4.2 Lauzon Parkway and Interchange Ramps

The new interchange will have intersections at the north and south ramp terminals for the E-N/S and W-N/S Ramps for the traffic exiting Highway 401.

6.4.2.1 Signalized Intersections

It is anticipated that the south T-intersection at the W-N/S Ramp terminal will be signalized due to high traffic volumes and queuing. It is also anticipated that both left and right turning traffic will need their own dedicated turning lanes.

6.4.2.2 Unsignalized Intersections

It is anticipated that a north T-intersection at the E-N/S Ramp terminal will be unsignalized due to low traffic volumes and low queuing. A single lane will be utilized to allow left and right turning traffic without the use of dedicated turning lanes.

6.5 Active Transportation Infrastructure

A new Multi Use Pathway (MUP) will be implemented to accommodate the pedestrian and bicycle traffic. The MUP will generally run in the north-south direction along the Lauzon Parkway whereas it will cross Highway 401 at Concession Road 9.

6.5.1 Horizontal Alignment

6.5.1.1 Horizontal Curves

The minimum horizontal curves for an Active Transportation Trail are shown in *Table 5-5* and *Table 5-6* in the *MTO Bikeways Design Manual, March 2014*. The minimum radii for the proposed MUP are 20 m which satisfy design speed of 30 km/h and 35 m which satisfy a design speed of 40 km/h. The minimum curves of 20 m occur at the hairpin turn for the bikes ascending or descending to or from the Concession Road 9 bridge.

6.5.2 Vertical Alignment

6.5.2.1 Vertical Curves

The minimum lengths of crest vertical curves for an Active Transportation Trail are shown in *Table 5-7* in the *MTO Bikeways Design Manual, March 2014*. The proposed length of vertical curve over a crest is 190 m for a 5% grade difference, which meets and exceeds the design standard.

6.5.2.2 Profile Grades

The maximum profile grade for an Active Transportation Trail according to *MTO Bikeways Design Manual, March 2014* is 3-5% for a design speed of 35 km/h for a max distance of 75 m, 40 km/h for a max distance of 150 m and 45 km/h for a distance of >150m. According to *Accessibility Standards Canada Clause 6.10.11.3,* maximum allowable slope is 5% without the need for rest area and total slope not to exceed 8% (Profile Grade + Cross Slope). The proposed MUP profile has a maximum grade of 3% for approximately 190 m that occurs on the approach and departure from the Concession Road 9 bridge.

6.5.3 Cross-Section

The cross-section of the MUP will be a 3.0 m wide two-way path with 2% slope from the crown to allow adequate drainage.

6.6 Structures

6.6.1 Lauzon Parkway Underpass

The Recommended Plan includes constructing an underpass to carry Lauzon Parkway over Highway 401. The proposed structure will feature a two-span integral open abutment bridge and each span will accommodate the ultimate Highway 401 configuration of five lanes plus an off-ramp speed change lane.

6.6.2 Concession Road 9 Underpass

The Recommended Plan identifies that the existing Concession Road 9 structure would be replaced with a new structure and will include a Multi-Use Pathway (MUP) on the structure. The structural alternatives and evaluation for the Concession Road 9 Underpass were presented at the Public Information Centre (PIC) for this project. Following the PIC and the selection of the Preferred Plan, refinements were made to the Preferred Plan that included refinements to the grading and property impacts in order to adhere to Ministry design standards. These changes are shown in the Recommended Plan (see Figure 1), presented in this TESR. The proposed work is to replace the existing underpass with a two-span underpass that can accommodate ultimate highway cross-section and ramps. The structure will be replaced on the existing alignment, which will result in a temporary road closure of approximately one construction season. This construction option results in the shortest construction duration and the lowest cost. Details regarding the final design, property impacts, and construction sequencing for the Concession Road 9 Underpass will be confirmed during Detail Design.

6.6.3 Concession Road 10

The Recommended Plan identifies that the Concession Road 10 structure and crossing would be closed and removed, with a cul-de-sac on both sides of Highway 401. Alternate access

would be provided via the new Highway 401 and Lauzon Parkway interchange, Concession Road 8, 9 and 11. Details regarding the closure of Concession Road 10 Underpass will be confirmed during detail design.

6.7 Traffic Signage

Traffic signs for the Recommended Plan will follow guidance in the *Ministry's OTM Book 8,* the MTO Design Supplement for TAC Geometric Design Guide (GDG) for Canadian Roads – 2017 (October 2023).

6.7.1 Ground Mounted Signs

Ground mounted signs are required at the Highway 401 and Lauzon Parkway interchange, and the sign design will be completed during Detail Design.

6.7.2 Overhead Sign Support Structures

Overhead Sign Support Structures (OHSS) are required at the Highway 401 and Lauzon Parkway interchange. The design of the OHSS will be completed during Detail Design.

6.8 Drainage

6.8.1 Culvert Recommendations

In general, specific maintenance work is recommended for the existing centreline culverts to ensure proper design service life of the infrastructure. Specific recommendations for culvert replacement have been made in the instance of MTO standard exceedance, and to help mitigate identified areas of flooding concern. In instances where the culvert was in fair – good material condition, and MTO Design Criteria were met, the culvert is recommended to be replaced. The culvert recommendations are summarized in Table 15.

Table 15: Culvert Conditions Summary

Culvert ID	Station	Shape	Proposed Dimensions Diameter or Span x Height (m)	Inspection Summary	Replacement Recommendation
9th Concession Drain	15+450	Box	3.6 x 2.1	Good condition, 0.6 m water depth	Replace and upsize to mitigate flooding
Little River Drain	16+150	Box	2.4 x 1.8	Good condition, algae build up, stagnant water	Replace and upsize to mitigate flooding
W-N/S Ramp		Box	2.4 x 1.8	N/A	New Culvert
N-W Ramp		Box	2.4 x 1.8	N/A	New Culvert
North MUP		Box	2.4 x 1.8	N/A	New Culvert
Watson Drain	16+800	Box	2.4 x 1.8	Good condition	Replace and upsize to mitigate flooding

6.8.2 Stormwater Management Strategy

The proposed stormwater management (SWM) strategy was designed to meet SWM design guidelines and policies as outlined in the MTO *Drainage Management Manual* (1997), the Ministry of the Environment *Stormwater Management Planning and Design Manual* (2003), and the MTO *Highway Drainage Design Standards* (HDSS) (2025).

Drainage from the proposed interchange is split by Lauzon Parkway, with areas west of Lauzon Parkway draining to Little River Drain and areas east of Lauzon Parkway draining to the Watson Drain. Drainage is further divided by Highway 401 (with flows only crossing the highway at the centerline culverts) and Little River Drain (which crosses Highway 401 about 75 m west of Lauzon Parkway, making it difficult to concentrate drainage from the proposed improvements in a single SWM facility.

The proposed road improvements are generally located near the upstream end of the Little River Drain and Watson Drain watersheds. Quantity controls in these areas would be effective in mitigating increases in peak flows from the highway improvements.

Water quantity controls are proposed for the Little River Drain and Watson Drain Outlets while 9th Concession outlets uncontrolled to the downstream receiver (with flow rates identical to existing). The SWM controls have been located in the southeast and northwest quadrants where there is sufficient space for water storage. These facilities are designed to overcontrol

flows from their quadrant to mitigate impacts from other areas of the interchange where quantity controls are not proposed (northeast and southwest quadrants and the area between Lauzon Parkway and Littler River Drain).

Water quality control is required at all outlets, and typically vegetated ditches are sufficient in rural areas. The storm sewer system should be designed to outlet a minimum of 100 m from the nearest watercourse in order to provide sufficient length of water quality control in the ditch, where possible. Low Impact Development features can also be used to provide water quality control as required.

Vegetated ditches and enhanced grass swales are recommended to provide water quality controls where possible for enhancing the storm drainage from the proposed highway. In addition to being consistent with design features typically implemented in highway drainage systems, these types of water quality features typically have lower maintenance costs than centralized stormwater management basins.

The MTO HDSS (SW-3) recommends that roadside ditches have a minimum base width of 1.0 m and a minimum length of 40 m. Highway embankments can also be used to improve water quality. The highway embankment should be a minimum 3.0 m in length measured from the edge of the shoulder to the invert of the roadside ditch to maximize sediment removal. This is most important for road areas that do not drain to a roadside ditch but drain directly to a watercourse.

Highway embankments and roadside ditches should be planted with dense vegetation to prevent erosion and trap sediments. Rock check dams can be used along steep grades (greater than 2%) to reduce velocities and erosion.

Linear Dry Detention Facilities are proposed to provide SWM controls for highway drainage to Little River and Watson Drain where the interchange modifications are proposed. The linear dry detention facilities provide water quantity control and some water quality benefits by reducing pollutant and sediment loading downstream.

To quantify the downstream drainage impacts of the proposed highway improvements, a hydrologic model was developed to assess flows from existing and proposed drainage catchments. The proposed conditions include a higher impervious percentage to represent the highway widening. Proposed flows are less than existing conditions, and no negative downstream impacts are anticipated.

6.9 Entrances

The recommended plan will modify four (4) residential entrances, two (2) field entrances and one (1) commercial entrance on Concession Road 9.

Table 16 provides a summary of the entrances as they relate to the new Concession Road 9 bridge replacement.

Table 16: Summary of Impacts on Existing Entrances

Road	Entrance No.	Station	Side of Road	Entrance Type	Comment
Concession Road 9	1	9+527	Left	Residential	
	2	9+539	Left	Residential	
	3	9+695	Right	Commercial	Windsor Campground
	4	9+716	Left	Field	
	5	9+738	Right	Commercial	Hurricane Hydrovac Services Inc.
	6	10+217	Right	Residential	
	7	10+264	Left	Field	
	8	10+301	Left	Residential	

Some entrance modification may be required for tie-ins to the new Concession Road 9. Embankments are close to the entrance to properties west side of Concession Road 9 and will need to be further refined in detailed design when the footprint of embankments is confirmed.

Where entrance modifications are required, they will be addressed with the property owner in Detailed Design so that road access is maintained to the properties.

6.10 Foundations

Foundations field investigations and testing will be undertaken for the Little River Culvert Extensions, Lauzon Parkway Underpass, and the OHSS during Detail Design.

6.11 Pavement

A pavement design will be completed for Highway 401 speed change lanes, interchange ramps, Lauzon Parkway, and other crossing roads during Detail Design.

6.12 Illumination

Illumination requirements will be reviewed and confirmed during Detail Design. It is anticipated that partial illumination will need to be installed at the new Highway 401 and Lauzon Parkway interchange.

6.13 Utilities

Utility relocations will be required to accommodate the Recommended Plan. Potential utility conflicts have been identified, and a Utility Conflict Plan is being completed. Relocation plans for utilities will be confirmed during Detail Design.

6.14 Property

The Recommended Plan is expected to result in the partial acquisition of approximately 8 properties and 33.15 ha of property outside of the existing ROW limits to construct the interchange. MTO will communicate with all directly affected landowners where property will be required to provide compensation.

It is anticipated that the Recommended Plan may also result in partial impacts and entrance alterations to an additional 8 properties specifically for the Concession Road 9 structure replacement, however, those impacts will be confirmed in Detail Design.

6.15 Construction Considerations and Staging

Construction of the Recommended Plan is anticipated to take approximately three years. Impacts to traffic on Highway 401 will be mitigated where feasible. An overnight closure of Highway 401 is anticipated to remove the existing Concession 9 underpass and Concession 10 underpass. Other temporary closures of Highway 401 will be required to install new bridge girders and OHSS. Temporary lane closures on Highway 401 will also be utilized throughout construction as required.

It is anticipated that Concession Road 9 will be closed temporarily for approximately 1 construction season during construction of the new structure. The Recommended Plan also includes the permanent closure of Concession Road 10 with construction of a cul-de-sac at each terminus with Highway 401.

Additional information regarding the construction duration and sequencing, anticipated temporary closures, and proposed detour routes will be confirmed during Detail Design.

7.0 Environmental Impacts and Mitigation

In accordance with the *Class EA for Provincial Transportation Facilities and Municipal Expressways* (2024) and the *Environmental Reference for Highway Design* (2013), a description of the anticipated impacts associated with the Recommended Plan, and appropriate mitigation at a Preliminary Design level of detail, is described herein. The details of the Recommended Plan will be refined and finalized during the next stage of the planning design process, Detail Design.

7.1 Natural Environment

Impacts to the natural environment have been minimized in part, by minimizing footprint impacts to undisturbed natural environments. This includes selecting a Recommended Plan that minimizes impacts to natural environment features in the study area, wherever feasible.

To the extent possible, project facilities are sited to avoid and minimize interactions with wooded areas, and potentially impacted properties; where avoidance is not possible, mitigation or compensation measures will be developed in consultation with the applicable regulatory authorities.

Although the Recommended Plan will have direct impacts to wildlife habitat and vegetation, impacts at the larger watershed and ecosystem scale are not expected to be significant.

7.1.1 Erosion and Sediment Control

An Erosion and Sediment Overview Risk Assessment (ESORA) was completed for the study area to determine the erosion risk potential for the anticipated construction works. It is expected that erosion potential exists as part of the project due to the anticipated grading work associated with the new interchange and overall construction activities. As a conservative best management practice, it is recommended that the erosion and sediment control measures consider the study area to have erosion and sediment risks range from low to High. The standard grading treatment includes 2:1 maximum fore-slopes and back-slopes for cuts and high fills. However, given the anticipated erodibility of the soils in the study area, maximum slopes of 3:1 are recommended for preliminary design purposes. The flatter slopes will better control sheet drainage velocity and quantity when compared to standard 2:1 slopes, which will help mitigate erosion of the cut and fill slopes. Interceptor ditches can also be implemented along or at the base of slopes to discharge sediment laden water to areas where erosion and sediment control measures are present. The grading cross-sections and erosion and sediment control measures will be confirmed during future design phases.

Approach 3: Main and Supplemental Erosion and Sediment Control Plan (ESCP) will be implemented for the study area during future design phases, in accordance with MTO Guidelines. This approach includes a technical memo, ESC Drawings and contract documents corresponding to MTO non-standard special provisions (NSSPs). The additional component of the Approach 3 method requires the contractor to develop a supplemental ESCP. Selection of Best Management Practices will be completed during detailed design. The BMPs are subject to change during construction and should be evaluated and applied through each phase of construction for successful mitigation of on-site erosion potential.

The ESCP should identify how to manage water, control erosion and control sedimentation, including where to install appropriate BMPs, how to install the BMPs and when to install, maintain and remove BMPs. The following ESC procedures should be considered for the ESCP:

- Employ a multi-barrier approach.
- Retain existing vegetation and stabilize exposed soils with cover.
- Limit the duration of soil exposure and phase construction when possible.
- Limit the size of disturbed areas by minimizing nonessential clearing and grading.
- Reduce slope length and gradient of disturbed areas.
- Maintain overland sheet flow and avoid concentrated flows.
- Store/stockpile erodible materials away (e.g., greater than 15 m) from watercourses, drainage features and top of steep slopes.
- Provide reasonable professional effort to involve contractors in ESC practices and determine if the contractors are trained in ESC Plan implementation, inspections, maintenance, and repairs.
- Adjust ESC Plan at construction site to adapt to site features.
- Assess all ESC practices before and after significant rainfall (>10mm) and snowmelt events.

Cover is the single most effective erosion control method to protect downstream receivers. Therefore, the priority of ESCP should be to limit the disturbed areas and preserve the existing cover to protect the exposed soil from wind, rain splash and overland flow.

7.1.2 Potential Contaminated Property

The Recommended Plan is expected to impact four areas of potential concern identified as having the potential to have contaminated subsurface soil and/or groundwater conditions. These properties include a historic gasoline spill that reportedly occurred at the intersection, importation of fill material of unknown quality, and gasoline and associated products storage in fixed tanks.

Further investigation would be required to confirm soil quality within the Areas of Potential Concern identified at the Project Area. In addition, the following recommendations are provided:

- A Preliminary Site Screening (PSS), Phase I ESA and Phase II ESA (if recommended as part of the PSS or Phase I ESA) should be completed for any property that will be acquired by MTO in accordance with the requirements of the MTO documents Environmental Guide for Contaminated Property Identification and Management (MTO, 2006) and Environmental Reference for Highway Design (MTO, 2013). If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition.
- Ontario Regulation (O.Reg.) 406/19 and the associated document Rules for Soil Management and Excess Soil Quality Standards referenced by O.Reg. 406/19 should be followed for soil that is excavated and managed on-site or off-site during construction. This includes sampling soil that is intended to be excavated prior to or during construction that may require off-site management as excess soil. The soil sampling program will be undertaken according to a sampling and analysis plan, and analyses will be performed for the specific contaminants of potential concern, as described in the APEC summary table.
- Sampling programs should be developed and undertaken under the supervision of a qualified person as defined in O.Reg. 406/19 and sample selection should take into consideration of the presence of anthropogenic substances such as debris/waste, and unusual odours or staining.
- Stockpiling and transport of excavated soil and sediment during construction should be done in accordance with the requirements specified in O.Reg. 406/19.

7.1.3 Fish and Fish Habitat

The Recommended Plan may impact fish and fish habitat due to proposed modifications near watercourses. These include altering existing culverts and drainage features, installing new culverts, and conducting general construction activities within 30 metres of watercourses. Additionally, the proposed Multi-Use Pathway (MUP) involves realigning an existing watercourse, which could further affect fish and fish habitat. Based on the preliminary design available at the time of this TESR, the following potential impacts have been identified:

9th Concession Drain (Site ID 4)
The replacement of the Concession Road 9 bridge, inclusion of a MUP and modifications to the Highway 401 eastbound and westbound lanes to accommodate new on- and off-ramps are anticipated to result in the following:

- Extension of the existing open-foot culvert to the north and south sides of Highway 401 to accommodate platform widening for the added speed change lanes.
- Works within 30 metres of the 9th Concession Drain on both the north and south sides of Highway 401 as part of the bridge replacement and associated approaches.

Hurley Drain (Site ID 5)
Construction of the new interchange and the northern approach associated with Lauzon Parkway is anticipated to result in:

- Works within 30 metres of the Hurley Drain near the Lauzon Parkway northern approach.

Little River Drain (Site ID 6)
Construction of the new Parclo A4 interchange, including new ramps, bridge, and approaches associated with Lauzon Parkway, is anticipated to result in the following:

- Extension of the existing open-foot culvert on both the north and south sides of Highway 401 to accommodate the eastbound and westbound on-ramps.
- Installation of new culverts under the eastbound off-ramps and westbound on-ramps.
- Realignment of a portion of Little River Drain to accommodate the multi-use trail, with the potential for a new crossing.
- Works within 30 metres of the Lauzon Parkway bridge and approaches.

Watson Drain (Site ID 7)
Closure or replacement of Concession Road 10 / County Road 17, along with modifications to Highway 401 for new on- and off-ramps associated with Lauzon Parkway, is anticipated to result in:

- Extension of the existing open-foot culvert on both the north and south sides of Highway 401 to accommodate the eastbound off-ramp and westbound on-ramp.
- Works within 30 metres of Watson Drain along County Road 17 for road removal or closure.
- Ditch maintenance activities.

7.1.3.1 Potential Enhancement Measures and Design Recommendations

Opportunities for habitat enhancement were identified for the proposed works, key strategies include implementing a two-stage channel and natural channel design for the realigned section of the Little River Drain, as well as installing new and extended culverts on the Little River Drain, 9th Concession Drain, and Watson Drain in a way that promotes fish passage—this involves proper sizing, embedment, and inclusion of low-flow channels. Additional opportunities outside the study area, such as removing a beaver dam and sediment deposits, may further improve upstream conditions. Within the study area, stabilization of roadway embankments is advised to minimize erosion and sedimentation, and the use of native riparian plantings is recommended to expand buffer zones, stabilize soils, and enhance habitat quality.

Replacing or removing obstructive agricultural laneway culverts will also support improved fish passage and drainage, while active management of invasive European Common Reed (Phragmites) will help maintain the ecological integrity of the watercourses.

7.1.3.2 Preliminary Mitigation Measures

The following mitigation measures have been identified and will be reviewed and confirmed during the subsequent design phase of the project. Additional mitigation measures will also be identified following the completion of the fisheries assessment, which will be undertaken during the subsequent design phase of the project.

Based on the Preliminary Design:

- Hurley Relief Drain and Sullivans Creek Drain are not expected to have any proposed works within 30 metres of the watercourses.
- Hurley Drain has proposed works within 30 metres but outside the high-water level. A fisheries assessment, including an aquatic effects assessment, will be required. A Project Notification Form is anticipated for this watercourse.
- 9th Concession Drain, Little River Drain, and Watson Drain have proposed works that may result in residual effects to fish and fish habitat. Fisheries assessments, including aquatic effects assessments, will be required. DFO Request for Review forms are expected for these watercourses.

Timing Windows

The in-water construction window for watercourses in the study area where fish habitat was identified is July 16 to March 14 inclusive (i.e., in-water work is not permitted from March 15 to July 15). This timing window does not apply to work above the high-water level.

Ontario Provincial Standard Specifications

The following OPSSs are applicable to the project:

- OPSS.PROV 180 - General Specification for the Management of Excess Materials
- OPSS.PROV 182 - General Specification for Environmental Protection for Construction in and Around Waterbodies and on Waterbody Banks
- SSP 101F23 – Amendment to OPSS 182, April 2021 – Timing of In-water Works, Oversight Requirements, and Measures to Avoid Harm to Fish
- OPSS.PROV 517 - Construction Specification for Dewatering
- OPSS.PROV 803 - Construction Specification for Vegetative Cover (issued in November 2020 to replace former OPSS.PROV 804)
- OPSS.PROV 804 - Construction Specification for Temporary Erosion Control (issued in April 2021 to replace the erosion control components of former OPSS 805)
- OPSS.PROV 805 - Construction Specification for Temporary Sediment Control (issued in November 2020 to replace the sediment control components of former OPSS 805)
- OPSS.PROV 825 - Construction Specification for Placement of Aggregates in Waterbodies
- OPSS.PROV 1005 - Material Specification for Aggregates - Waterbody

The OPSSs are applicable to the following general activities:

- **Equipment Use -** Use of equipment shall be in accordance with OPSS.PROV 182.
- **Dewatering and Temporary Flow Passage** - Dewatering and/or temporary flow passage shall be according to OPSS.PROV 517 and OPSS.PROV 182.
- **Fish Salvage** - Fish salvage operations shall be conducted in accordance with OPSS.PROV 182 (SSP 101F23).
- **Preservation of Riparian Vegetation** - Removal of riparian vegetation shall be in accordance with OPSS.PROV 182.
- **Erosion and Sediment Control** - Installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS.PROV 182, OPSS.PROV 804 and OPSS.PROV 805.
- **Placement of Aggregates in Waterbodies** - Use of aggregate in waterbodies shall be according to OPSS.PROV 825 and OPSS.PROV 1005.
- **Restoration of Disturbed Areas** - Vegetation protection and rehabilitation shall be in accordance with OPSS.PROV 182, OPSS.PROV 803 (Vegetative Cover, Non- Amendment to OPSS.PROV 803) and OPSS.PROV 804.
- **Management of Excess Materials** - All excess material shall be managed in accordance with OPSS.PROV 180.

7.1.4 Terrestrial Habitat

The proposed interchange will require vegetation removal, earth clearing, and grading and will result in the loss of approximately 37.49 ha of terrestrial habitat within the study area, of which 28.19 ha is agricultural land (see Table 17). Construction activities in some areas will extend beyond the current ROW and require vegetation removal and earth grading, which will result in the loss of natural vegetation communities.

Table 17: Terrestrial Habitat to Be Removed from the Study Area per Hectare (ha)

Vegetation Community	Area to Be Removed (ha)
Agricultural Communities	
OAGM1	28.19
Meadow Communities	
ME	0.75
MEMM3	4.96
Plantation Communities	
TAGM1	0.20
TAGM3	0.18
TAGM5	1.49
Forest Communities	
FODM11	0.21
Wetland Communities	
MAMM1-2	0.53
MAMM1-12	0.15
Aquatic Communities	
SA	0.82
Total	**37.49 ha**

7.1.4.1 Potential Disturbance to Vegetation and Terrestrial Habitat

It is anticipated that the proposed works will disturb approximately 37.49 ha of vegetation cover and terrestrial habitat during construction. There will be temporary and permanent loss or disturbance to native vegetation communities because of the clearing required to accommodate construction activities (i.e., excavation, demolition, staging).

The following indirect impacts may also occur as a result of construction:

- Accidental damage or loss of trees and other vegetation features because of site alteration or construction activities
- Temporary disturbance of noise, vibration, and vegetation removal to terrestrial wildlife habitat
- Erosion and sedimentation into adjacent vegetation communities
- Permanent loss of native vegetation due to the spread of non-native and invasive vegetation species into disturbed areas after construction

7.1.4.2 Potential Interference with Nesting Birds

Barn Swallow, Cliff Swallow and other unidentified swallow nests were observed in bridge structures at Concession Road 9, Concession Road 10/County Road 17, and Concession Road 11 where they intersect Highway 401, during field investigations. Rehabilitation or replacement of bridges have the potential to disturb nesting behavior or damage/destroy nests.

A Downy Woodpecker nest was observed in the THDM3 community along Highway 401, near the Hurley Relief Drain at the western extent of the study area. Vegetation within the Work Zone also has the potential to support migratory bird nests. Any work near active bird nests has the potential to disturb nesting behavior or damage/destroy the nests, particularly if vegetation clearing occurs during the active breeding bird window (i.e., April 1 - August 31).

Measures to address protected bird nests will be implemented as outlined in Section 7.1.5.3.

7.1.4.3 Potential Disturbance to Significant Wildlife Habitat

Vegetation removal will result in permanent and temporary loss of candidate and confirmed Significant Wildlife Habitat (SWH). Permanent habitat loss includes areas where there is permanent infrastructure and temporary habitat loss are areas that can be restored following construction (e.g., staging areas etc.). The following SWH features were confirmed in the study area:

- Terrestrial Crayfish Burrows
- Habitat for SOCC (Barn Swallow, Monarch, Prairie Milkweed, Shellbark Hickory, Climbing Prairie Rose, and Missouri Ironweed, Snapping Turtle)

In addition, the following candidate SWH features were present in the study area:

- Habitat for SOCC (Rusty Blackbird, Giant Ironweed, Shumard Oak, Midland Painted Turtle)

Construction phase disturbance to candidate SWH can be mitigated through standard environmental protection measures for Sediment and Erosion Control and vegetation protection, as discussed in Sections 7.1.5.1**.** Standard mitigation to reduce harm to wildlife is provided in Section 7.1.5.4, while site-specific mitigation for Bat Maternity Colonies is provided in Section 7.1.6.4.

7.1.4.4 Potential Disturbance to Species at Risk and Species of Conservation Concern

Suitable habitats for SAR and SOCC in the study area was primarily associated with agricultural areas, watercourses, and wetlands. Potential impacts to SAR and SOCC that may

be encountered in Work Zones include bat SAR, Barn Swallow, Monarch, Shellbark Hickory, Missouri Ironweed, Snapping Turtle and Midland Painted Turtle and are discussed below.

Construction phase disturbance to habitat of SAR and SOCC can be mitigated through standard environmental protection measures for Sediment and Erosion Control and vegetation protection, as discussed in Section 7.1.5.1, respectively, and through site-specific measures as discussed in Section 7.1.6. Measures to mitigate impacts to protected bird nests are outlined in Section 7.1.5.3. Mitigation to reduce harm to wildlife is provided in Section 7.1.5.4.

7.1.4.5 Species at Risk

The following three (3) SAR have potential to be directly impacted during construction activities due to their behavior, habitat preferences, or movement patterns:

Bat SAR (Eastern Red Bat, Hoary Bat, Silver-haired Bat) – Potential bat maternity roost habitat is present within forest and individual trees in the proposed area of impact. Tree removal can result in direct mortality to bat SAR and loss of habitat. Protection for bats is provided by the timing restrictions identified in Section 7.1.6.4. If timing of construction activities cannot abide the timing restrictions for bats, acoustic monitoring for bat SAR is recommended during Detail Design.

7.1.4.6 Species of Conservation Concern

The following three SOCC have potential to be directly impacted during construction activities due to their behavior, habitat preferences, or movement patterns:

Monarch - Primarily found in areas containing milkweed and wildflowers (including goldenrods, asters, and purple loosestrife). The larvae occur only where milkweed exists, whereas adults are more generalized, feeding on a variety of wildflower nectar. Monarch and its habitat (i.e., milkweed patches) were observed in roadside meadows, which will experience temporary and permanent disturbance during construction. Site-specific mitigation measures for Monarch are discussed in Section 7.1.6.4.

Turtle SOCC (Midland Painted Turtle, Snapping Turtle) – Interaction with turtle SOCC during construction activities could result in direct mortality. The drains, watercourses and wetlands in the study area may provide suitable habitat for turtles and individuals may also travel through Work Zones. Turtles may be particularly vulnerable during peak activity periods (April 1 to October 31), including movement between wintering and nesting sites, nesting in the road shoulder and basking or foraging in the ROW. The loss of a pond that could potentially provide suitable turtle habitat, which was not studied due to a lack of access, may impact habitat availability in the study area. Although this pond does not qualify for SWH due to its anthropogenic nature, it could provide overwintering habitat. Mitigation measures to reduce potential impacts to turtles are discussed in Section 7.1.6.4.

Plant SOCC (Shellbark Hickory, Missouri Ironweed) – Removal of Shellbark Hickory and Missouri Ironweed is required as they overlap with proposed impact areas. Site-specific mitigation measures are discussed in Section 7.1.6.4.

7.1.4.7 Protection and Mitigation Recommendations

Mitigation discussed below will reduce the likelihood and magnitude of impacts to the natural environment. The following section describes standard measures that should be applied to all work areas. These general measures recommended for the protection and reduction of impacts to natural features, general wildlife and wildlife habitat, will also reduce risk of potential impacts to SAR and SOCC. Site-specific recommendations for natural features, SWH, or habitat of SAR/SOCC confirmed in the study area or conservatively assumed to be present, are discussed in Section 7.1.6.

7.1.5 Standard Environmental Protection Measures

7.1.5.1 Erosion and Sedimentation Control

Mitigation measures for sedimentation, erosion, and dust control will be implemented to prevent sediment and dust from entering sensitive natural features. The primary principles associated with sedimentation and erosion protection measures are to:

- Reduce the duration of soil exposure
- Retain existing vegetation, where feasible
- Encourage re-vegetation
- Divert runoff away from exposed soils
- Keep runoff velocities low
- Trap sediment as close to the source as possible

To address these principles, the following mitigation measures are recommended:

- Silt fencing and/or barriers are recommended along Work Zones where there is potential for sedimentation of watercourses or wetlands, or inadvertent encroachment of construction vehicles into natural areas.
- Avoid entering any natural areas beyond the barrier fencing with equipment and avoid excess vegetation removal.
- Re-vegetate disturbed areas as soon as possible to help re-stabilize soils following OPSS 803 (Construction Specification for Vegetative Cover). Vegetation plantings shall include a seed mix that is appropriate to the area and similar to or better than pre-construction conditions.

- Re-fuel equipment 30 m away from watercourses to reduce potential impacts if an accidental spill occurs.
- In addition to any specified requirements, make additional silt fence available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
- Monitor all sediment and erosion controls regularly and properly maintain, as required. Remove controls only after the soils of the construction area have been stabilized and adequately protected or until cover is re-established.
- Monitor limits of construction adjacent to natural features during construction (along with sediment and erosion control measures) to make sure that the limits are maintained with respect to vehicular traffic and soil or equipment stockpiling.
- Avoid stockpiling excess materials on site.
- Restore any disturbed natural areas to pre-construction conditions.

7.1.5.2 Vegetation Protection

Precise limits of vegetation removal will be confirmed during Detail Design. During construction adjacent to vegetated areas, heavy equipment could damage peripheral vegetation from contact, excavation, and/or soil compaction. In areas where trees are present adjacent to construction activities that are not required to be removed for grading, tree protection is recommended to avoid encroachment.

Post-construction seeding of the disturbed ROW should be done with a suitable native seed mix. Seed mixes should include fast-growing, short-lived perennial cover crop to stabilize soil and reduce competition from weedy exotics. It is recommended that new seed be introduced to disturbed substrates as soon as feasible following construction and sediment fencing remain in place until vegetation cover is re-established.

Vegetation removal should be undertaken outside of the migratory bird nesting period (April 1 to August 31) and bat window (April 1 – September 30). If in-water works/vegetation removals are required within wetlands that may also support turtle wintering habitat (i.e., removal of the SA pond), those activities should occur between April and October to avoid potential harm to overwintering turtles.

7.1.5.3 Protection of Nesting Birds

Barn Swallow, Cliff Swallow and other unidentified swallow nests were observed in bridge structures at 9th Concession Road, County Road 17, and 11th Concession Road where they intersect Highway 401. Additionally, a Downy Woodpecker nest was observed along Highway 401.

The MBCA protects nests of migratory birds from damage while they are active, including nests in vegetation and on structures. For all migratory birds, the core nesting period is identified as April 1 to August 31. Vegetation clearing during nesting periods in migratory bird breeding habitat can destroy active nests and contravene the MBCA. Vegetation clearing is recommended to occur outside the core nesting period to eliminate the need for migratory bird nest searches. If work must take place during the core nesting period and the area is small enough to be effectively searched for nesting birds (e.g., isolated trees or hedgerows), then a breeding bird survey can be completed by a Qualified Biologist. The area where bird nests may be impacted must be searched within five days prior to the work commencing. If breeding pairs are located, then they will be protected with a buffer until the nest is no longer active.

If an active nest is observed during construction, a designated buffer will be delineated within which no activity will be allowed to occur while the nest is active (i.e., with eggs or young). The radius of the buffer will also be determined by a Qualified Biologist. Once the nest is determined to be inactive (e.g., the young have fledged the nest), clearing and other activities in the area may proceed.

7.1.5.4 Wildlife Protection

The following mitigation and protective measures for wildlife and wildlife habitat are recommended:

- Construction equipment and vehicles are to yield to wildlife
- Inform construction personnel not to threaten, harass or injure wildlife
- If wildlife are encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site.
- If slow-moving wildlife (e.g., turtles, snakes) are observed on the road and are in danger, and if safe to do so, they will be moved off the road by gently guiding the individual in the direction it was traveling. Handling of SAR is not permitted without an ESA authorization.

7.1.6 Site-Specific Protection Measures

Site-specific protection measures are required for sensitive species or habitats that may be present within the study area and where standard mitigation measures alone do not provide sufficient protection.

7.1.6.1 Rare Plants

Loss of rare plants (Shellbark Hickory and Missouri Ironweed) is anticipated. To reduce the extent of impacts, the following mitigation measures are recommended:

- Salvage and transplant rare species within the study area, where possible.
- If feasible, include the rare plant species in seed mixes. Seed will be locally sourced to preserve native genetics.

7.1.6.2 Terrestrial Crayfish

Vegetation removal should be scheduled during periods when crayfish are less likely to be present, such as early spring (i.e., March to April), when adults are found in streams, lakes, and rivers, where possible. Vegetation should be retained adjacent to crayfish habitat as this is important for foraging. Avoid spraying pesticides to control roadside vegetation near crayfish habitat as this can impact food supply. It is recommended to use other de-icing compounds other than salt near crayfish habitat. During construction isolation and dewatering, direct surface water runoff away from crayfish habitat to avoid sedimentation and contamination.

7.1.6.3 Monarch

If possible, avoid construction activities that have the potential to harm monarch eggs, caterpillar or pupae (e.g., vegetation clearing in meadow areas) during the larval period, which is approximately June 1 to September 30 (COSEWIC 2016). If vegetation clearing will proceed when Monarch larvae may be present (June 1 to September 30), identification and inspection of milkweed plants shall be completed to locate Monarch larvae. If larvae are identified, a trained Environmental Monitor may relocate the species to a suitable and safe location under the direction of a Qualified Biologist. Monarch caterpillars may be moved to other milkweed plants; for other larval stages (i.e., eggs and chrysalis), entire milkweed plants should be transplanted. Milkweed and nectar producing plants are recommended to be included in seed mixes for areas restored to meadow to provide habitat for Monarch.

7.1.6.4 Species at Risk/Species of Conservation Concern

The mitigation measures presented below follow general guidance for the protection of SAR/SOCC and are consistent with approved measures implemented on similar projects in Ontario. Species-specific measures are provided for species commonly encountered along roadways or in construction zones. Further field investigations, including targeted surveys, should be undertaken during Detail Design to confirm the presence of SAR and their habitat. ESA authorization requirements, if any, for SAR will be determined at Detail Design.

The following mitigation recommendations are provided to reduce the risk to SAR and SOCC through avoidance of habitat features, timing windows and observations of potential refuges.

General mitigation to reduce impacts to SAR or SOCC and their habitats include:

- Inform on-site personnel of the potential presence of the SAR/SOCC identified in the study area, obligations under the ESA, and recommended actions in the event of an encounter.
- Species listed as endangered or threatened on the SARO list that are present in the study area must be protected from harm and harassment.
- Any SAR that is incidentally encountered in the study area must be allowed to leave of its own accord. Activities within 20 m will cease until the individual disperses. Construction machinery/equipment must maintain a minimum operating distance of 20 m from the individual until it disperses from the Work Zone on its own accord.
- If on-site personnel are unable to allow a SAR to leave the active construction area on its own, MECP must be contacted immediately for additional guidance.
- Any SAR that is encountered in the Work Zone will be reported to the MECP staff within 48 hours of the observation or the next working day, whichever comes first.
- If an injured or deceased SAR is found, the specimen must be placed in a non-airtight container that is maintained at an appropriate temperature and MECP must be contacted immediately for additional guidance.
- Temporary alterations to SAR habitat must be limited to the duration and spatial extent possible and be remediated upon completion of activity and monitored as necessary.

7.1.6.5 Turtles

There is potential for two Species of Conservation Concern (SOCC)—the Snapping Turtle and the Midland Painted Turtle—to be encountered within the Work Zone during construction. Turtle nesting typically occurs in June, with eggs remaining in the nest until September. The mating season generally spans from late May to early July, which is when turtles are most likely to be encountered. Overwintering occurs in wetlands with standing water and soft substrates, typically between November and March.

If in-water work or vegetation removal is required in wetlands that may support turtle wintering habitat, these activities should be completed between April and October. This timing helps to avoid potential harm to overwintering turtles. Construction work must be planned accordingly to minimize ecological impacts during sensitive periods.

Exclusion fencing, such as light geotextile silt fencing, should be erected around proposed construction areas before work begins to reduce the likelihood of turtles entering the site. If construction activities are expected to occur during the nesting season, fencing should be installed in advance to prevent turtles from entering and nesting. Fencing must be properly installed with the fabric lip backfilled and compacted.

All fenced areas should be inspected daily to identify any damage or breaches. Any turtles trapped along the fence should be safely removed. The fencing must also serve as a barrier to prevent construction sediment from entering adjacent wetlands, maintaining both ecological integrity and compliance.

A qualified person should conduct a pre-construction sweep of the work area and continue monitoring during the turtle nesting season (June to August) to identify any active nests. If turtle eggs are discovered or unearthed, all construction activities must stop immediately within a 5-metre radius of the nest. Similarly, if a turtle is observed nesting (e.g., digging or sitting in a

nest pit), work must cease within 5 metres of the animal, and the turtle must be left undisturbed until it completes the nesting process and leaves on its own.

A worker awareness program should be implemented for all construction staff. This training should include information on how to identify Snapping Turtles and Midland Painted Turtles, as well as their typical habitat and behavior. Increasing worker awareness is essential for ensuring compliance and minimizing the risk of harm to these species.

From May 15 to July 15 of any year, stockpiled topsoil, sand, and gravel must either be completely encircled with silt fencing or entirely covered with geotextile material to prevent turtles from accessing and nesting in the material. This precaution reduces the likelihood of turtles choosing these piles as nesting sites.

When installing exclusion fencing, use a type that is durable enough to last the entire duration of the project. Stakes should be driven into the ground securely on the inside of the working area, spaced 2 metres apart, and inserted to a depth of 30 cm. The fabric must be pulled tight to prevent sagging, with the bottom edge buried 10–20 cm below ground and an additional fabric lip extending outward at a 90-degree angle.

7.1.6.6 Bats

Trees > 10 cm DBH are present in the study area and within the proposed area of impact. These trees may be used by bat SAR as maternity habitat. The following mitigation measures are recommended to address bat SAR.

Trees that have the potential to be used as maternity habitat by bat SAR may be present within the areas proposed for vegetation removal. To identify potentially suitable bat SAR trees, follow-up surveys (during Detail Design) are recommended during leaf-off in areas where vegetation removal is proposed. Trees will be surveyed to identify trees that are >10 cm DBH, with cavities or loose, peeling bark and will be completed following the guidance outlined in MECP's survey protocol: *Treed Habitats – Maternity Roost Surveys* (2022), which references the *Bats and Bat Habitats: Guidelines for Wind Power Projects*. If potential bat trees are identified within the area proposed for removal, acoustic surveys or maternity exit surveys may be needed prior to tree removals.

Additionally, to further reduce the likelihood of harm to bats, removal of trees > 10 cm DBH is recommended to take place outside the period when bats use trees for maternity roosts. Myotis species typically give birth in late-May to early-June, and females fly with newborn young until they become too heavy. Young begin to fly in mid- to late-June, at age three to four weeks. Rearing is completed in August when the bats move to hibernacula. Therefore, tree removal should not occur between May 1 to August 31. If tree clearing is required within this window, maternity exit surveys may be conducted prior to the tree removals, as mentioned above. Maternity exit surveys are conducted during the evening and should include visual and acoustic surveys using accepted protocols.

Consultation with MECP is recommended prior to any bat maternity roost tree removals to receive up-to-date guidance on appropriate surveys and mitigation measures to remain compliant under the ESA.

7.1.6.7 Consideration of the Endangered Species Act, 2007

The provincial ESA prohibits the killing, harming, harassing, capturing, or taking of a living member of a species listed as threatened, endangered, or extirpated by the SARO list (O. Reg. 230/08) (S. 9). Damage to habitat (S. 10) is also prohibited except where a permit is issued under S. 17(2) of the same Act or the Activity is registered under the Species at Risk Registry.

Potential habitat for SAR was identified in the study area but could not be confirmed during preliminary field investigations. Targeted surveys bat SAR are recommended at Detail Design to determine if species and/or habitat is present within Work Zones.

Consultation with MECP is recommended during Detail Design to discuss potential impacts to Snapping Turtle, Midland Painted Turtle, Monarch, Butler's Gartersnake, and bat SAR that may result from the Project after mitigation, and to determine potential authorizations/permits.

An Information Gathering Form (IGF) is recommended for submission through MECP at the detailed design stage to initiate the approval process under the ESA for bat SAR and to confirm absence for Butler's Gartersnake.

7.2 Climate Change

The global climate is influenced by the presence of natural and human made Greenhouse Gases (GHG). Current scientific knowledge does not allow a clear prediction of the effects of an individual Project on climate change, and the Project is therefore assessed in terms of CO_2e produced and released to the atmosphere and how this compares with national and provincial levels and reduction targets.

Greenhouse gases (GHG) are gases that contribute to potential climate change by trapping heat in the atmosphere. GHGs are known to contribute to warming of the climate, leading to many other changes around the world: in the atmosphere; on land; and in the oceans (IPCC 2021).

Common GHGs include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). Other GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6), and nitrogen trifluoride (NF3).

The Project is expected to emit CO2, CH4, and N2O from the combustion of fuels in vehicles and all three of these GHGs are assessed in this study. The incremental increase in GHG emissions due to the Future Build scenario (Recommended Plan- 2044), in relation to the Future No Build scenario (2044) is 6.7 kt CO_2e per year. This increase represents 0.0042% of the 2023 GHG emissions in Ontario and 0.00096% of 2023 GHG in Canada, as well as 0.0046% of Ontario's 2030 target and 0.0015% of Canada's 2030 targets. These potential

changes are considered insignificant in relation to the 2023 Canada and Ontario GHG emissions totals and the 2030 emissions targets. No direct increase in traffic volume is anticipated from the Recommended Plan, and the Recommended Plan is not expected to have a significant impact on the regional and provincial greenhouse gas targets. It is also anticipated that advancements in fuel efficiency and vehicle technologies will also result in an overall decrease in regional and provincial annual greenhouse gas emissions.

Stormwater management and drainage infrastructure for the Recommended Plan will be designed considering climate change impacts in the Detail Design phase.

7.2.1 Cumulative Effects

While the Recommended Plan is not expected to result in significant adverse environmental impacts on its own, the potential for cumulative effects was considered in the context of existing and planned infrastructure, ongoing urban development, and regional growth. These cumulative effects may include gradual changes to land use, increased impervious surfaces, and associated impacts on local ecosystems and drainage patterns. Mitigation measures outlined in this study, including stormwater management and habitat protection strategies, are intended to minimize the contribution of this project to broader cumulative effects.

As the project advances to detailed design, cumulative effects will continue to be assessed to ensure that design refinements and mitigation measures appropriately address potential long-term and regional impacts.

7.3 Socio-Economic Environment

7.3.1 Land Use

7.3.1.1 Property

The Recommended Plan is expected to result in the partial acquisition of approximately 8 properties and 33.15 ha of property outside of the existing ROW limits to construct the interchange (see Figure 1: Recommended Plan). MTO will communicate with all directly affected landowners where property will be required to provide compensation.

Additional property impacts and entrance alterations specifically for the Concession Road 9 structure replacement will be further refined in Detail Design.

Following completion of the study, MTO will confirm and designate the Recommended Plan to protect the corridor for future needs. A highway designation provides route protection and establishes a permit control area (as shown in Figure 19: Lauzon Parkway Interchange – Permit Control Areas), which allows MTO to review and manage future development along and adjacent to the proposed highway corridor. Within the permit control area, certain activities such as the construction or alteration of buildings, changes in land use, or new entrances require MTO approval to ensure compatibility with the planned highway and maintain public safety and access management objectives. For further information regarding permit control areas please see: https://www.ontario.ca/page/highway-corridor-management#section-3

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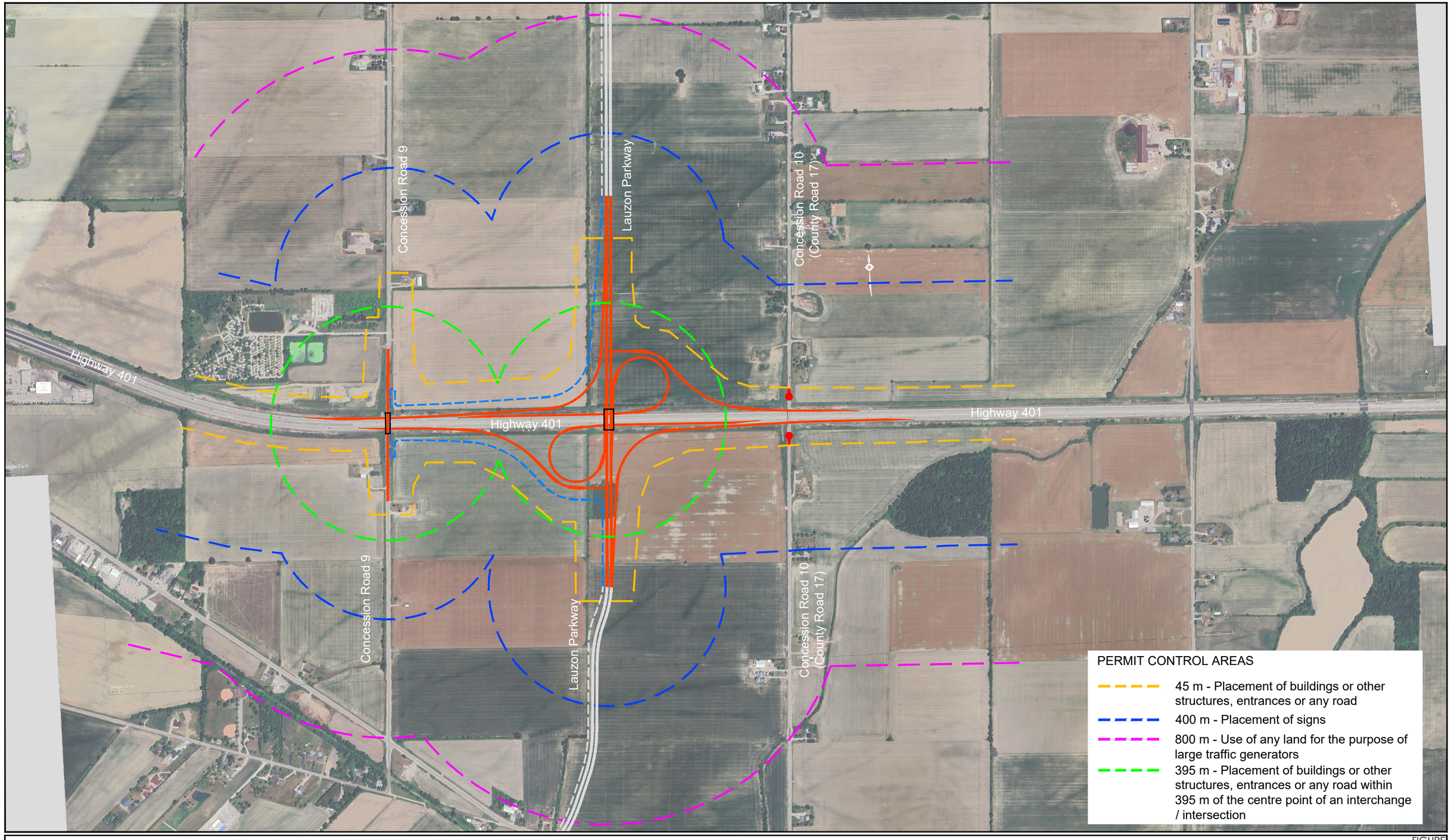

Stantec

HIGHWAY 401
Windsor, ON
GWP 3028-23-00
Assignment Number 3023-E-0020

LEGEND

- New Roadway
- New Multi-Use Path
- New Roadway as part of Separate Project by others
- New Multi-Use Path as part of Separate Project by others

FIGURE 19

Lauzon Parkway Interchange

Permit Control Areas

SCALE 1:12,000

7.3.1.2 Communities

There are no direct impacts to municipal community facilities. There may be minor temporary delays for traffic during the construction phase on local and county roads for the interchange. No other impacts/minor changes are anticipated to community facilities in the study area.

7.3.1.3 Agriculture

Approximately 16.4 ha of land south of Highway 401 is defined as Agricultural land in the County of Essex Official Plan and the Town of Tecumseh Official Plan and will be no longer available for farming. The project team will work with potentially impacted farmers to minimize impacts as much as possible to agricultural operations and maintain crossings to adjacent farms for access and farming operations.

7.3.1.4 Student Transportation

The project will involve the permanent closure of Concession Road 10/ County Road 17, however the new Lauzon Parkway Interchange bridge will be constructed and will provide alternate access over Highway 401.

There may be minor temporary delays for students/school transportation services that travel through the intersection during the removal of the structure; however, all student transportation services will be notified prior to construction to reduce potential delays prior to construction, if any.

7.3.1.5 Emergency Services

No permanent impacts are anticipated for emergency service providers that service the study area and surrounding communities. There may be minor temporary delays for EMS services that travel through the area during construction. EMS providers will be consulted during Detail Design, and will be notified of any delays prior to construction, if applicable.

7.3.1.6 Air Quality

An Air Quality Impact Assessment was completed to characterize baseline air pollutant emissions and predict air quality effects within the study area after implementation of the project in the Future Build (2044) scenarios for the project alone and cumulatively with background air quality levels. Predicted future emissions and effects with Project implementation (Future Build) are compared to both existing baseline and future conditions without the Project, for a total of three assessment scenarios.

This study was conducted following guidance from the MTO's *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects* (MTO Guide) (MTO 2020). Changes in greenhouse gas (GHG) emissions are assessed in this study. Additionally, potential air quality impacts during project construction are assessed qualitatively.

Baseline ambient air quality conditions were characterized from historical data obtained from ECCC's National Air Pollution Surveillance (NAPS) Network and MECP for stations located near the study area. The United States Environmental Protection Agency's (US EPA's) Motor Vehicle Emission Simulator (MOVES) model version 3 (MOVES3) was used to estimate baseline and future emission rates from motor vehicles. The US EPA dispersion model, CAL3QHCR was used to predict the maximum 1-hour, 8-hour, 24-hour, and annual average ground level concentrations (GLCs) at special receptors for the three assessment scenarios.

- 2024 – Baseline (existing conditions)
- 2044 – Future No-Build (without the Project)
- 2044 – Future Build (with the Project)

The air quality assessment indicates that exceedances of Particulate Matter less than 2.5 micrometres, Benzo(a) pyrene and benzene are predicted to occur for certain averaging periods under both Future No-Build and Future Build scenarios. As demonstrated above, these exceedances are primarily driven by background concentrations, which are the dominant contributors to cumulative levels.

Although the Project's contribution to these exceedances is expected to be minimal, future reductions in transportation related emissions are anticipated due to the ongoing transition to newer, lower-emission, and electric vehicles. The implementation of the Project is also expected to enhance traffic flow and reduce congestion on the local road network, thereby contributing to improved air quality over time. Additional measures to mitigate the impacts of particulate matter and gaseous emissions may include the integration of vegetative barriers into the landscaping design. The effectiveness of vegetation as a physical barrier for air contaminant control depends on the density, height, and structure of the planting. Effective vegetative barriers are typically at least 6 metres thick, with dense foliage and continuous leaf and branch coverage from the ground to the top of the canopy, without gaps at the base or within the structure. Evergreen species are generally more effective than deciduous trees for this purpose, and the barrier should be located as close as possible to the emission sources (U.S. EPA 2016).

Air Quality During Construction

During construction of the project, dust will be the primary CoPC. Other CoPC such as NO2 and VOCs will also be emitted from equipment used during construction. As the construction activities will be short-term and intermittent, no significant adverse effects on local air quality are expected provided adequate mitigation measures are implemented. The ECCC guideline *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* (ECCC 2005) provides recommendations for mitigation measures to reduce construction emissions. These measures include material wetting or use of chemical suppressants to reduce dust, use of wind barriers, covering or stabilizing exposed areas which may be a

source of dust, and equipment washing. It is recommended that appropriate best management practices be followed during project construction.

7.3.1.7 Noise

Operational Noise

A Noise Impact Assessment was complete in accordance with the MTO Environmental Guide for Noise (MTO, 2022), while construction noise was assessed using the Ontario Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment (MOE), publications NPC-115 (MOE, 1978), NPC-118 (MOE, 1978). To determine operational noise impacts, future predicted noise levels in 2044 with the Project (Future Build) were compared to those without the Project (Future No-build). Where the predicted Future Build noise levels increase more than 5 dB over Future No-build scenario and/or exceed 65 dBA, noise mitigation is investigated. For the mitigation to be implemented, it must be technically, economically, and administratively feasible.

Project road traffic noise impact was assessed at eleven (11) representative receptors from one (1) noise sensitive areas (NSAs) within the study area, and the assessment was completed based on the criteria published in applicable MTO *Environmental Guide for Noise*. The assessment considered future traffic for horizon year 2044, as provided by the traffic team (CIMA+).

The assessment predicts that Future Build noise levels do not exceed the MTO thresholds that would trigger a noise mitigation investigation. Therefore, mitigation measures were neither investigated nor recommended for the Project operations.

Construction Noise

Most of the construction equipment expected for the Project can operate in compliance with MECP limits. However, there is a potential for higher sound levels from some equipment (e.g., paving machines and impact pile drivers). Once equipment types and construction schedules are finalized, construction equipment sound levels should be reviewed to confirm that the noise emissions are within permissible limits. If they are higher than the limits and the equipment is planned to be used near NSAs, noise control options should be explored for the construction equipment exceeding the limits. To minimize construction noise during construction, it is recommended that the following mitigation measures be carried forward for consideration during the subsequent phase of the project:

- All construction equipment should properly be maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- There should be explicit indication that Contractors are expected to comply with all applicable requirements of the contract and any applicable local by-laws.
- The Contract documents should contain a provision that any initial noise complaint will trigger verification of construction noise and typical noise control measures.
- In the presence of persistent noise complaints, all construction equipment should be verified to comply with MECP NPC-115 and NPC-118 limits.

7.4 Cultural Heritage Environment

7.4.1 Archaeological Resources (Land)

The Stage 2 archaeological assessment will be completed during Detail Design. A Stage 2 report will therefore be completed at that time to document the findings.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b). The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

8.0 Public Consultation

The main objective of consultation in the Class EA process is to ensure that project information is shared in a meaningful way, and that consideration is given to all aspects of the environment from the earliest stages of planning. Communication with potentially impacted and/or interested parties is key in the planning process and provides a mechanism for the proponent to define and respond to issues prior to key decisions being made. Recognizing this, the study team initiated a comprehensive program from the onset of the study, as described herein.

All interested parties were offered early and ongoing opportunities to review study information and provide input to the decision-making process. To achieve this, a variety of communication strategies were used to engage the public, agencies, interest groups, property owners and community members. As a first step, a Consultation Plan was developed and described the following elements:

- Study notifications (Notices of Study Commencement, Public Information Centre (PIC), and Study Completion)
- A dedicated project website
- Communication with external agencies in order to obtain pertinent technical information and identify the requirement for legislative or regulatory approvals related to the undertaking
- Meetings with municipal staff
- Communication with affected property owners where temporary or permanent interest in property is required
- Communication with local residents and businesses
- Public Information Centre was held April 16, 2025.
- A copy of all public notification materials is provided in Appendix B.

All input received was incorporated into the project findings and recommendations, as appropriate, and responses were provided to all input received.

All project correspondence to/from the public was collected in accordance with the *Freedom of Information and Protection of Privacy Act.* Accordingly, with the exception of personal information, all public comments form part of the public record.

8.1 Project Website

A project website (https://www.hwy401lauzon.ca/) was developed at the onset of the study to provide the public with easy access to project information. The project website was maintained throughout the study and included background information, project team member contact information, PIC materials, links to project-specific documentation (i.e., study notifications, EA processes, TESR) and supplementary information.

8.2 Project Email Address

The project website allowed interested parties to contact the project team directly through the dedicated project email address (comments@hwy401lauzon.ca).

8.3 Notice of Study Commencement

The purpose of the Notice of Study Commencement was to inform the public and external agencies about the study and to seek initial input in relation to the study. The notice briefly outlined the objective of the study, the Class EA process, study area location map and contact information for project team representatives.

The Notice of Study Commencement was communicated via newspaper advertisements in the *Essex Free Press* and *Windsor Star in* English and *Windsor Le Rempart* in French on May 2, 2024. It was also posted on the project website. A hard copy of the notice was also sent to approximately 4,200 residents and businesses during the week of April 24, 2024, via Canada Post unaddressed admail. Letters were sent to agencies requesting information on the environmental (i.e., natural, social, and cultural) features of the study area and to seek their input on the project. In addition, email notifications were distributed on May 2, 2024, to agencies on the project mailing list and to stakeholder groups expected to have an interest in the study. The email correspondence included the Notice of Study Commencement (NOSC) flyer, which provided information about the study and a map of the study area. The following external agencies and stakeholders were included on the project mailing list and received the email correspondence:

Provincial Agencies

- Ministry of Natural Resources, Aylmer District
- Infrastructure Ontario
- Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
- Ministry of the Environment, Conservation and Parks
- Ministry of Citizenship and Multiculturalism
- Ministry of Municipal Affairs and Housing (MMAH)

Municipal Agencies

- County of Essex – Clerk, Chief Administrative Officer, Manager of Planning, Director of Infrastructure and Planning
- City of Windsor – Chief Administrative Officer, Manager – development/ Deputy City Planner, Executive Director of Engineering, engineer, Transportation Department
- Town of Tecumseh – Chief Administrative Officer, Engineering Project Manager, Director of Public Works, Director of Engineering Services

Local Elected Representatives

- MPP – Windsor-Tecumseh
- Mayor - Town of Tecumseh
- Mayor - City of Windsor
- Mayor - Essex County

Emergency Services

- Ontario Provincial Police, Essex County Detachment
- Town of Tecumseh Fire Service
- Essex-Windsor EMS
- Windsor Police Service
- Windsor Fire and Rescue Services

School Boards/ Bus Service

- Windsor-Essex Student Transportation Services
- Windsor-Essex Catholic District School Board
- Greater Essex County District School Board
- Le Conseil Scolaire Catholique Providence

Other Stakeholders

- Ontario Federation of Agriculture - Essex County
- Ontario Federation of Agriculture
- Windsor-Essex Regional Chamber of Commerce
- Essex Region Conservation Authority
- Little River Enhancement Group
- Ontario Trucking Association

A copy of the agency mailing list is provided within Appendix A.

It should be noted that staff from the City of Windsor and County of Essex were kept informed throughout the duration of the study. Where required, additional meetings were held with relevant agencies or municipalities to discuss project specific issues.

A total of 19 letters, emails, and phone calls were received following the Notice of Study Commencement up to, and beyond the requested submission date of May 31, 2024. A copy of the comments received from agencies and public and associated responses are provided in Appendix C. A copy of the notices issued in relation to study commencement is provided in Appendix A. A copy of the public and agency correspondence received following the Notice of Study Commencement is located in Appendix C.

8.4 Public Information Centre

The PIC was held in person, on April 16, 2025, at the Ciociaro Club, located at 3745 North Talbot Road, Oldcastle, Ontario. The PIC was held from 4:00 PM to 7:00 PM and was open to the public. Impacted property owners were invited to meet with the project team at the PIC location from 2:00 PM - 3:00 PM, while external agencies were invited to attend a drop-in meeting at the same location from 3:00 PM to 4:00 PM. PIC materials were provided on the study website (www.hwy401lauzon.ca.) beginning on April 16, 2025, and comments were requested by May 16, 2025. The purpose of the PIC was to generally introduce the project and the existing conditions, preliminary alternatives, evaluation of alternatives, and the Preferred Plan.

The PIC was advertised in the *Essex Free Press* and *Windsor Star in* English on Thursday, April 3, 2025, and *Windsor Le Rempart* in French on April 10, 2025. The Notice was also posted on the project website in advance of the meeting. In addition, notification letters were emailed to external agencies, and individuals on the project mailing list on April 2, 2025.

A hard copy of the notice was also sent to approximately 3,900 residents and businesses during the week of March 31, 2025 via Canada Post unaddressed admail.

Letters were sent to property owners anticipated to be directly impacted by the preferred plan on April 3, 2025. Impacted property owners were invited to meet with the project team at the PIC location from 2:00 PM- 3:00 PM to discuss any property concerns and the MTO property acquisition process.

A total of twelve (12) representatives from six (6) external agencies attended the drop-in session from 3:00 PM to 4:00 PM, and thirty-six (36) people attended the public drop-in session from 4:00 PM to 7:00 PM. External agency representatives consisted of the Ontario Federation of Agriculture, City of Windsor, Essex Region Conservation Authority, County of Essex, Town of Tecumseh, and the Ontario Provincial Police.

During the in-person PIC, verbal comments and questions were asked to the project team, as follows:

Questions regarding:

- The use of the existing roadway for the alignment of Lauzon Parkway and the proposed interchange

- The phasing of the Lauzon Parkway Study and the timing for construction
- Coordination between the Ministry, City, County, and Town on concurrent projects
- The drainage design at the interchange and its connection to the Little River

Comments received included:

- Essex County noted that the County Active Transportation (AT) network should be reviewed in connection with the proposed MUP option
- Property owners expressed concerns about potential impacts to their properties from the Lauzon Parkway Study
- Concerns were raised regarding the loss of farmland
- Some affected property owners expressed support for the project
- The Little River Enhancement Group raised drainage, stormwater management, and Species at Risk (SAR) concerns, and indicated they will submit a letter with additional comments
- Residents near County Road 42 and Highway 401 opposed the closure of Concession Road 10
- Local property owners raised concerns about advance purchase requests from the Town and City
- Impacted property owners requested compensation for crop damage resulting from field investigations, noting mid-June harvest timing for winter wheat
- Comments were made regarding the download of excess lands
- The Essex Region Conservation Authority advised that updated stormwater modelling data is available through the City of Windsor

In total, 27 letters and emails were received following PIC and by the requested submission date of May 16, 2025. In general, comments included construction schedule, closure of Concession Road 10, property owner impacts, and requests to be added to the project mailing list.

A copy of the information displayed at the PIC, as well as the feedback received at, and following the PIC is provided in Appendix B and Appendix C.

8.5 Municipal Consultation

In addition to providing local municipal staff notification of key study milestones and/or consultation events, the project team also organized a Municipal meeting on January 20, 2025.

8.5.1 Municipal Meeting

A Municipal Meeting was held virtually on January 20, 2025, in advance of the PIC. Municipal and regional staff members and emergency service providers were invited to attend that meeting, and members of the project team and MTO representatives were present to discuss the project overview for the PIC. Representatives from City of Windsor Engineering, Development, Public Works, Operations and Planning department staff members, County of Essex Infrastructure & Planning, Development and Transportation department staff members. Town of Tecumseh Engineering and Public Works department staff members.

A copy of the meeting summary is provided in Appendix C.

8.6 Agency Correspondence

A number of agencies were consulted to verify the existing conditions of the study area, and to solicit feedback throughout the study on the alternative solutions and requirements of the area. Table 18 summarizes the agency correspondence for this project.

Table 18: Agency Correspondence

Contact Information	Issue/Concern	Response/Action taken by Project Team
Environmental Resource Planner/Environmental Assessment Coordinator Environmental Assessment Branch Ministry of the Environment, Conservation and Parks	• Emailed response (May 6, 2024) noting: – Acknowledged receipt of Notice of Study Commencement – Provided Areas of Interest, Client's Guide to Preliminary Screening for Species at Risk and further instructions on project notifications for MECP throughout the duration of the project	• Notice of Study Commencement (NOSC) sent May 2, 2024 • Emailed to note that the Project Information Form has been sent to the eanotification.eregion@ontario.ca (May 2, 2024) • Emailed response on noting: – The project team will review all applicable policies and planning documents • Public Information Centre (PIC) notification sent April 2, 2025
Regional Planner Ministry of Natural Resources and Forestry	• Emailed response (May 7, 2024) noting: – Letter provides information in identifying and assessing natural features and resources as required by applicable policies and legislation, as well as engaging with the Ministry for advice as needed. – Information provided regarding MNRF GIS resources available, as well as Natural Hazards information. – The proponent is also advised to check the applicability of the following legislation: › Petroleum Wells & Oil, Gas and Salt Resources Act › Fish and Wildlife Conservation Act › Public Lands Act & Lakes and Rivers Improvement Act	• Notice of Study Commencement (NOSC) sent May 2, 2024 • Emailed response not required MNRF natural environment GIS resources will be accessed to review the applicability of the information to this project. – Impacts to the following legislation are not anticipated, and therefore a response is not required as per their letter. › Petroleum Wells & Oil, Gas and Salt Resources Act › Fish and Wildlife Conservation Act › Public Lands Act & Lakes and Rivers Improvement Act • Public Information Centre (PIC) notification sent April 2, 2025
Heritage Planner Heritage Branch Citizenship Inclusion and Heritage Division Ministry of Citizenship and Multiculturalism Ontario Public Service	• Emailed (May 31, 2024) noting the following: – Please find attached our initial advice on the above-mentioned undertaking. – MCM interests in the following areas: › archaeological resources, including land and marine; › built heritage resources, including bridges and monuments; and, › cultural heritage landscapes. – MCM to be contacted if there are cultural heritage or archaeology reports prepared for MCM review. Findings of any reports are to be incorporated into EA documents.	• Notice of Study Commencement (NOSC) sent May 2, 2024 • Emailed to note the following: – A Stage 1 archaeological assessment is planned for this project to determine whether additional archaeological assessments may be required, and it will be circulated to MCM when the document is complete.

Contact Information	Issue/Concern	Response/Action taken by Project Team
	• Emailed (April 3, 2025) noting the following: – Our records indicated that a Stage 1 archaeological assessment (under PIF P256-0799-2024) has been carried out for this project and has been entered into the Ontario Public Register of Archaeological Reports (maintained by MCM). – But could you please advise whether the study area has been screened for known or potential built heritage resources and cultural heritage landscapes and/or is the subject of a cultural heritage assessment? We would appreciate if you could share any completed screening checklists or heritage assessment with us.	• Public Information Centre (PIC) notification sent April 2, 2025 • Emailed to note the following: – 10th Concession Road Underpass and 9th Concession Road Underpass were screened by MTO, and it was determined that Cultural Heritage Evaluation Reports were not required due to low potential cultural heritage value or interest (CHVI). The completed screening checklists are attached.
Special Projects Manager Town of Tecumseh	• Emailed (May 3, 2024) to highlight the Town of Tecumseh's interest in the future interchange.	• NOSC sent May 2, 2024 • Public Information Centre (PIC) notification sent April 2, 2025 • Municipal Meeting (January 20, 2025) Meeting Invite
Executive Director of Engineering City of Windsor	• Attended Municipal Meeting (January 20, 2025) attended meeting	• NOSC sent May 2, 2024 • Public Information Centre (PIC) notification sent April 2, 2025 • Municipal Meeting (January 20, 2025) Meeting Invite
Essex Region Conservation Authority	• Emailed (May 7, 2024) thank you for Notice of Study Commencement and circulate planning@erca.org	• NOSC sent May 2, 2024 • Public Information Centre (PIC) notification sent April 2, 2025 • Municipal Meeting (January 20, 2025) Meeting Invite

Contact Information	Issue/Concern	Response/Action taken by Project Team
<u>Other Attendees at the Municipal Meeting:</u> City of Windsor – Manager of Development Planning City of Windsor – Executive Director of Public Works/ Development City Engineer City of Windsor – Planning Senior Engineer City of Windsor –Technologist, Economic Development City of Windsor – Commissioner, Infrastructure Services/City Engineer County of Essex – Director, Infrastructure & Planning County of Essex – Solicitor County of Essex – Manager, Transportation Planning and Development County of Essex – Manager, Construction Services Town of Tecumseh – Project Manager, Engineering Town of Tecumseh – Director of Public Works Town of Tecumseh – Manager of Engineering	• Attended Municipal Meeting (January 20, 2025) attended meeting	

A copy of all agency correspondence is provided in Appendix C.

8.7 Summary of Public Comments

Over the duration of the study, many comments were received from the public that covered various themes including concession road closure, emergency vehicle access, access for farm equipment, impacted properties, and property acquisition. Table 19 provides a summary of the main comments and themes and the associated responses provided by the project team. All comments, including those from agencies and the municipality, have been addressed and resolved, with no outstanding issues. With the exception of correspondence carried out at public consultation events, a copy of all remaining public correspondence is provided within Appendix C.

Table 19: Summary of Public Comments and Responses

Notice of Study Commencement	
Comment	**Response Provided and/or Action Taken**
Impacted Properties	
Will my property be impacted?	Thank you for your email and telephone call regarding the Permission to Enter letter you received. Your contact information has been added to the project mailing list and you will be notified at key project milestones. You are also encouraged to visit the project website (www.hwy401lauzon.ca) to obtain current project information. As requested, we are sending you a map showing where the environmental fieldwork will occur. The map below shows your farm on Concession 9, Windsor, Ontario and the fieldwork area is marked with a dotted line at the rear of the property and to the south along Highway 401. This is a general study area at this stage in the project, and it will be refined as the study proceeds. Should you have any questions regarding the Permission to Enter form sent to you, please let our project team know and we would be happy to discuss it further with you.
Roundabouts	
Can roundabouts be incorporated in the design both on the 401 and the Lauzon Parkway	Roundabouts will be considered as part of the interchange alternatives for this study
Agricultural Land and Access for Fieldwork	
Active agricultural land with planted crops not to be disturbed during field investigations	Project team will work with all farm owners to avoid impacts to planted crops
Mailing List	
Please add me to the mailing list	Thank you for your email. Your contact information has been added to the project mailing list and you will be notified at key project milestones. You are also encouraged to visit the project website (www.hwy401lauzon.ca) to obtain current project information.

PIC Comments	
Comment	**Response Provided and/or Action Taken**
Concession Road 10	
Closing Concession Road 10 should not be an option 1. When hospital is built Concession Road 9 traffic will increase 2. Agriculture equipment, fire trucks emergency vehicles, local commuters will need access to the 10th over 401. 3. Would increase traffic on Concession Road 11 • Don't close Concession 10, do an overpass at baseline for the new Lauzon Road.	Your comment with respect to keeping Concession Road 10 open has been noted by the project team. Potential impacts to travel patterns and routes will be minimized with the future proposed Highway 401 and Lauzon Parkway interchange, and the remaining crossings at Concession Road 9, 11 and existing interchanges at Provincial Road and County Road 19.
Schedule	
Tentative timeline of completion	At this stage, the timeline for the next phases of the study, including Detail Design and construction, has not yet been determined. Construction scheduling depends on a variety of factors, including regional and provincial priorities and available funding. This planning study is part of the Ministry of Transportation of Ontario's (MTO) broader efforts to review and enhance the provincial highway network. While we understand the importance of knowing when changes may occur, we can assure you that this study will play a vital role in supporting informed future planning by the Ministry, local municipalities, businesses, and private landowners within the study area.
Natural Environment	
There is an opportunity to improve and expand fish habitat: 9th and 10th Concession Drains, Little River Drain and Sullivan Creek. Culvert and drainage improvements need to be designed to allow the free movement of fish underneath Highway 401 and along the Little River tributaries.	Your interests in fish and wildlife habitat are noted by the project team. The natural environment studies being undertaken as part of this study will also identify appropriate protection and mitigation measures. This project includes a fish and fish habitat assessment that identifies existing fish data and fish habitat within the project study area and that also identifies and considers potential impacts to fish and fish habitat as a result of this study. The local drainage context for the Little River will also be considered as it pertains to the future interchange design as the study progresses.
Tree Inventory: Existing species of trees should be protected. As well, tree and plant SAR need to be included in the list of native trees to be planted throughout the *Inventory* area in land designated as natural areas).	Your interest and concern for Species at Risk vegetation and trees are noted. The project includes an inventory and vegetation assessment for potential SAR trees.
Multi Use Pathway: Connecting the Ganatchio Trail system in the City of Windsor with the Chrysler Canada Greenway system in the County of Essex needs to be considered to promote healthy lifestyles for humans as well as a Natural Corridor for the free movement of wildlife to promote and maintain biodiversity. The promotion of these "Ribbons of Green" should be a priority since all wildlife need natural cores and corridors to flourish. Along with preserving the existing natural areas, restoring natural	A multi-use connection and crossing of Highway 401 is recommended in the preferred plan to support broader regional connectivity and contribute to the long-term vision of an integrated natural corridor network.

PIC Comments	
Comment	**Response Provided and/or Action Taken**
corridors is necessary to preserve the ecological integrity of the Little River Watershed ecosystem.	
Sediment and Erosion Risk Assessment (The quality of water and the quality of the natural area in the Riparian Zone must be addressed in this *Assessment)*.	The project team is conducting an Erosion and Sediment Control Risk Assessment (ESORA), and an Erosion and Sediment Control Plan (ESCP) will be developed during the study's Detail Design phase in advance of construction.
The Preferred Plan impacts Little River which runs North-South through the study *area. New culverts and extensions may be required and may impact fish and fish habitat. Proposed mitigation measures will be determined once the Preferred Plan is refined and impacts are confirmed.* (This is a critical issue in the Detroit River Remedial Action Plan to delist the Detroit River as an Area of Concern. New culverts and extensions need to be designed to be fish friendly).	New culverts and culvert extensions will be designed to appropriately accommodate fish passage and minimize impacts on fish and aquatic habitats. As part of this study, our terrestrial and fisheries specialists will undertake impact assessments based on the preferred plan and will develop appropriate protection measures. These protection measures will be documented in the Transportation Environmental Study Report (TESR), which will be made available for a 30-day comment period near the end of the study. Impacts to the natural environmental will be confirmed as this study progresses to Detail Design, and mitigation measures will be tailored and implemented during construction.
Contamination Overview Study (Quality of water is a health issue and needs to be addressed for not only human health but also for the benefit of local wildlife using the area for their survival).	The project team has noted your concern regarding water quality. The project is reviewing local potential sources of contamination to determine if mitigation measures are required. In addition, the study team completed a surface water review of water crossings, and a groundwater overview study in summer 2024. Various erosion and sediment mitigation techniques will be employed during construction to reduce impacts to natural environment features. Impacts to surface water and groundwater will be considered as part of the next phase of the study, during Detail Design.
Existing natural heritage areas must be identified, preserved and protected. Creating natural areas and just as important, connecting them can be part of the mitigation measures. This also will address cultivating the resilience of our community to Climate Change. Regarding the wildlife using the study area, Species at Risk and biodiversity are other critical issues that need to be addressed.	This project includes a terrestrial ecosystems impact assessment, including considering potential habitat or observations related to Species at Risk. Your interest and concern for Species at Risk are noted. The terrestrial ecosystems investigations and study also includes a coverboard survey for potential SAR snakes. The terrestrial ecosystems impact assessment being undertaken will also identify appropriate protection and mitigation measures. As part of the Terrestrial Ecosystems Impact Assessment, the project also includes an inventory and vegetation assessment for potential SAR trees.
It is imperative that municipal planners and politicians consider the Biological Diversity that exists in the Windsor-Essex Community. Land use planning is racing ahead in our community and serious thought needs to take place with regard to Biological Diversity, Ian.	This project includes a terrestrial ecosystems impact assessment, including considering potential habitat or observations related to Species at Risk. This project also includes a fish and fish habitat assessment that identifies existing fish data and fish habitat within the project study area and that also identifies and considers potential impacts to fish and fish habitat as a result of this study. The natural environment studies being undertaken as part of this study will also identify appropriate protection and mitigation measures. These

PIC Comments	
Comment	**Response Provided and/or Action Taken**
	protection measures will be documented in the Transportation Environmental Study Report (TESR), which will be made available for a 30-day comment period near the end of the study.
The preliminary design and study did not provide any design or reference to any stormwater management outline or strategy or ponds related to the sandwich south master servicing plan and the upper little river management plan, that must be included as to any impact down river with design	The study team completed a surface water review of water crossings, and a groundwater overview study in summer 2024. Various erosion and sediment mitigation techniques will be employed during construction to reduce impacts to natural environment features. Drainage improvements, including stormwater management, will be further refined as this study progresses to the Detail Design phase.
Property Owners	
Will my property be impacted?	At this stage of Preliminary Design, the project team is aware that properties immediately adjacent to Highway 401 may be impacted. Possible impacts may include a temporary construction area on private land or the acquisition of property. We are in the process of assessing and refining the impacts. Once the Recommended Plan has been refined and confirmed, you will be contacted by the Ministry of Transportation Ontario with more information specific to your property. If you would like to discuss property impact concerns with MTO Property representatives, contact information provided at PIC

9.0 Indigenous Community Consultation

The Indigenous communities and/or organizations contacted with respect to this study were identified based on desktop research during the initial stages of the planning process by the Ministry of Transportation. Through this review, the following Indigenous communities were identified as having a potential interest within the study, and were notified of the study commencement, Public Information Centre, notification regarding participation in fieldwork being undertaken in the study area, and the study completion:

- Walpole Island First Nation(Bkejwanong Territory)
- Oneida Nation of the Thames
- Caldwell First Nation
- Chippewas of Kettle and Stony Point First Nation
- Chippewas of the Thames First Nation
- Delaware Nation at Moraviantown
- Munsee-Delaware Nation
- Aamjiwaang First Nation

9.1 Notice of Study Commencement

The Notice of Study Commencement and Request to Consult letter was sent via email to the above noted communities on May 1, 2024. The purpose of this correspondence was to provide information related to the study purpose, the Class EA process, and to invite each Indigenous community to participate in the consultation process.

A copy of the Notice of Study Commencement is provided within Appendix B.

9.2 Notice of PIC

The Notice of PIC was sent via email to the above noted communities on March 25, 2025 for the PIC held in-person on April 16, 2025, at Ciociaro Club, located at 3745 North Talbot Road, Oldcastle, Ontario.

The purpose of the letters was to invite communities to attend the PIC and also get input on the alternatives and preferred plans.

A copy of the Notice of PIC is provided within Appendix A. A copy of the information displayed at PIC is provided in Appendix B.

9.3 Meeting with Chippewas of Kettle and Stoney Point First Nation

On May 7, 2025, the Ministry met virtually with the Chippewas of Kettle and Stoney Point First Nation to provide an overview of the project. At the meeting, the community asked to be kept informed with project notices throughout the project's design phase. The community also noted availability of archaeological monitors for Stage 2 archaeology fieldwork, and environmental monitors available for the remaining natural sciences fieldwork on private properties. The community also expressed interest in impacts to the Little River and cumulative effects.

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10.0 Future Consultation

During the subsequent design stage of this undertaking, external agencies, Indigenous communities, and property owners will continue to be contacted and consulted regarding design/construction details and commitments to future work as outlined in this document, where appropriate and/or necessary.

10.1 Future Commitments

Future consultation will be required during the next phase of planning and design to deal with all outstanding issues, including permits and approvals from external agencies, consultation with Indigenous communities and detailed environmental investigations regarding impacts and mitigation, and engineering investigations to confirm the final design.

A summary of proposed future consultation is in Table 20.

Table 20: Future Consultation with External Agencies

External Agency	Subject of Consultation
Ministry of Natural Resources	• Natural environment (terrestrial) timing restrictions and mitigation in contract package • Confirm terrestrial impacts and mitigation
Ministry of the Environment, Conservation and Parks	• Confirm potential impacts to SAR that may result from the Project after mitigation • Confirm up-to-date guidance on appropriate bat SAR surveys and mitigation measures to remain compliant under the ESA • Submit Information Gathering Form • Endangered Species Act authorization/permit, if required
Essex Region Conservation	• Confirm potential impacts to regulated area in the southwest quadrant of the study area and potential mitigation measures
Indigenous Communities	• Subsequent planning and design process engagement • Construction timing, traffic management planning
County of Essex Town of Tecumseh City of Windsor	• Ongoing consultation during subsequent planning and design phase of project
Emergency service agencies (i.e., OPP, Fire, ambulance)	• Ongoing consultation during subsequent design phase of project to minimize impacts to emergency response times during and after construction • Consultation regarding the Traffic Management Plan • Consultation regarding the Final Detour Plans
All other agencies/groups involved in planning and preliminary design study	• Ongoing consultation during subsequent design phase of project
Property Owners	• Ongoing consultation during subsequent design phase of project with respect to property impacts, well and watermain impacts, and property acquisition. Property impacts resulting from the Concession Road 9 bridge replacement will be confirmed during Detail Design and property owners will be contacted by the Ministry to discuss the acquisition process.
Utility companies	• Ongoing consultation during subsequent design phase of project

Other issues to be dealt with during subsequent design process include:

1. Property concerns and entrance closures through negotiations with individual property owners
2. Concession Road 9 and 10 detail design and confirmation of property impacts
3. Additional details of the Recommended Plan such as tree clearing requirements
4. Completion of a Landscape Plan
5. Completion of Stage 2 Archaeological Assessment for Recommended Plan
6. Completion of outstanding natural sciences fieldwork on private properties (pending permission to enter from property owners)

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11.0 Summary of Environmental Effects, Proposed Mitigation and Commitments to Future Work

A summary of environmental effects, proposed mitigation, and commitments to future work, as identified during the course of this study, is provided in Table 21, and forms a comprehensive 'checklist' of outstanding issues identified at the end of Class EA and Preliminary Design and will serve as a starting point for the subsequent planning and design phase of the project.

Table 21: Summary of Environmental Effects, Proposed Mitigation and Commitments for Future Work.

Legend

MTO: Ministry of Transportation
MNR: Ministry of Natural Resources
MUN: Local Municipalities
PUB: General Public
EMS: Emergency Medical Services
RES/BUS: Local Residents/Business Owners
MECP: Ministry of Environment, Conservation and Parks
MCM: Ministry of Citizenship and Multiculturalism
STS: Student Transportation Services

I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work
Natural Environment				
1.0	**Surface Water** • Potential impacts to surface water and groundwater from disturbance of contaminated soils, leaks and accidental spills	MTO MECP	1.1	Complete drainage design to provide appropriate drainage capacity.
			1.2	Direct runoff and overland flow away from working areas and areas of exposed soils.
			1.3	Store all oils, lubricants and other chemicals in suitable containers and handle them in accordance with applicable regulations.
			1.4	Do not permit refueling within 30 m of a watercourse.
			1.5	Best management practices will be applied for fuel management including secondary containment of temporary fuel storage.
			1.6	Install debris platforms and/or collection systems to prevent dust, debris, effluent and visible emissions falling into watercourse.
			1.7	Prepare and follow spill response plan for construction. All spills will be cleaned up immediately, and contaminated materials will be disposed of in an approved manner. The MECP will be informed immediately of all reportable spills.
			1.8	Run-off from construction and stockpiles will be contained and discharged to prevent entry of sediment to water.
2.0	**Vegetation** • Potential for localized impacts to vegetation due to disturbance of common species	MTO MECP MNR	2.1	Right-of-Way clearing will be minimized to the extent possible. In areas where trees are present adjacent to construction activities that are not required to be removed for grading, tree protection is recommended to avoid encroachment.
			2.2	All vegetation clearing and grubbing activities will take place outside of the migratory bird nesting timing window (April 1 to August 31 of any year) based on the Migratory Birds Convention Act (1994), and the Contractor will also avoid the bat timing window (April 1 – September 30).
			2.3	Vegetation removal associated with construction related activities will be minimized, to the extent possible and where required Environmentally Sensitive Areas will be established to restrict access to sensitive areas during construction. Sediment controls to clearly mark and separate work areas from sensitive natural features (e.g., woodlands, wetlands, and watercourses) are recommended.
			2.4	Stockpiling of materials will be kept away from adjacent natural areas.
			2.5	A comprehensive Erosion and Sediment Control Plan will be completed during the next stage of planning and design.

I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work
			2.6	Post-construction seeding of the disturbed ROW should be done with a suitable native seed mix. Seed mixes should include fast-growing, short-lived perennial cover crop to stabilize soil and reduce competition from weedy exotics. It is recommended that new seed be introduced to disturbed substrates as soon as feasible following construction and sediment fencing remain in place until vegetation cover is re-established.
			2.7	Loss of rare plants (Shellbark Hickory and Missouri Ironweed) is anticipated. To reduce the extent of impacts, the following mitigation measures are provided: • Salvage and transplant rare species within the Study Area, where possible. • Include the rare plant species in seed mixes (i.e. West Region native seed mix). Seed will be locally sourced to preserve native genetics.
			2.8	A roadside Tree Inventory will be completed for trees impacted by the project in detailed design once access is provided for the identified properties affected by the project.
3.0	**Wildlife and Wildlife Habitat**	MTO MECP	3.1	The following General Wildlife Mitigation Measures are provided: • If wildlife is encountered during construction, personnel will move away from the animal and wait for the animal to move off the construction site. If slow-moving wildlife (e.g., turtles, snakes) are observed on the road and are in danger, and if safe to do so, they will be moved off the road by gently guiding the individual in the direction it was traveling. A qualified biologist will move or assist SAR snakes or SAR turtles encountered during construction that require relocation. • Wildlife shall not be harmed or harassed. • Construction equipment and vehicles will yield to wildlife. • Injured wildlife (SAR or non-SAR) will be transported to an authorized wildlife rehabilitator by an Environmental Monitor or Qualified Biologist. • If a snake hibernacula site is discovered, all work must cease, and a Qualified Biologist shall be contacted to discuss mitigation options. • If overwintering turtles or snakes are disturbed by construction activities, work will cease, and a Qualified Biologist will be contacted to discuss mitigation measures. Overwintering turtles and snakes will not be relocated. Where SAR are encountered, MECP will be contacted. • Immediately upon observation of an actively nesting female turtle, personnel and vehicles will clear the area within the turtle's line of sight as much as possible to allow the female to finish laying. Startling a nesting female could lead to abandonment of the partially laid nest before the eggs are concealed. • If potential turtle nest sites (i.e., areas of fresh digging in loose gravel or sandy material) are found within the work areas, work in that area will cease. The nests will be left undisturbed, flagged and a setback applied to protect against construction activities. If avoidance is not possible, egg salvage may be completed by a Qualified Biologist which will be detailed in a Salvage and Relocation Plan.
	Monarch • Monarch and its host plant Milkweed were identified within the study area.	MTO MECP	3.2	Vegetation clearing in meadow areas should not be undertaken during the larval period which is approximately May 1 to September 30 (Mission-Monarch 2020). If vegetation clearing will proceed when Monarch larvae may be present (May 1 to September 30), inspection of milkweed plants is recommended to locate Monarch larvae. If larvae are present, they may be moved to a location that is suitable and safe under the

I.D. #	Environmental Issues/Concerns and Potential Effects	Concerned Parties	I.D. #	Mitigation/Protection/Monitoring/Commitments to Further Work
				direction of a qualified professional. Monarch caterpillars may be moved to other milkweed plants; for other larval stages (i.e., eggs and chrysalis), entire milkweed plants should be transplanted.
	Terrestrial Crayfish • Chimneys/burrows were observed within ELC communities TAGM5 and MASM1-12 as well as roadside ditches along Highway 401.	MTO MECP	3.3	Habitat is present in the Work Zone and is anticipated to be impacted by the proposed construction activities. As such, to reduce the impact on Terrestrial Crayfish and their habitat the following mitigation measures are recommended: • Vegetation removal should be scheduled during periods when crayfish are less likely to be present, such as early spring (i.e., March to April), when adults are found in streams, lakes, and rivers, where possible. • Vegetation should be retained adjacent to crayfish habitat as this is important for foraging. • Avoid spraying pesticides to control roadside vegetation near crayfish habitat as this can impact food supply. It is recommended to use other de-icing compounds other than salt near crayfish habitat. • During construction isolation and dewatering, direct surface water runoff away from crayfish habitat to avoid sedimentation and contamination. The Crayfish habitat location is provided on Figure 3 of the Terrestrial Ecosystems Existing Conditions and Preliminary Impact Assessment report.
	Turtles and Reptiles • There is potential for two (2) turtle SOCC - Snapping Turtle and Midland Painted Turtle to be encountered within the Work Zone during construction. No Species at Risk Turtles were identified within the study area during project surveys.	MTO MECP	3.4	If in-water works/vegetation removals are required within wetlands that may also support turtle wintering habitat, those activities should occur between April and October to avoid potential harm to overwintering turtles: • Erect exclusion fencing (e.g., light geotextile silt fence) around proposed construction areas prior to start of work to reduce the likelihood of turtles entering the work area. • Install exclusion fencing prior to the sensitive nesting season if activities are anticipated to occur throughout this period to prevent turtles from entering and/or nesting: Prior to June 1 if activities are occurring within or adjacent to nesting habitat (i.e., exposed soils adjacent to or along riverbanks). If construction activities commence after June 1, a Qualified Biologist must be present on site to oversee the installation. • If erecting exclusion fencing, use a type that will last the duration of the project. Check that stakes are securely driven into the ground on the inside of the working area. Place stakes 2 m apart and drive them to a depth of 30 cm, with the fabric pulled tight to reduce sagging, and the bottom of the fabric buried 10-20 cm down within an additional fabric lip extending outwards 90 degrees. • Backfill and compact the fabric lip • Inspect any fenced off areas daily to identify compromises in the fence and to remove any turtles that may be trapped in the fence • Install fencing so that it prevents construction sediment from entering wetlands • Have a qualified person conduct a pre-construction sweep and monitor the work area for active turtle nests during the turtle nesting season (June-August). • If turtle eggs are encountered or unearthed during the construction activities all operations must immediately stop within 5 m of the active nest. • If a turtle is encountered that has already begun to nest (i.e., digging and/or sitting in a nest pit), construction activities should stop within 5 m of the turtle, and the turtle to be left alone to complete the egg-laying process and leave the area on of its own accord.

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				• Implement a worker awareness program for construction staff that includes Snapping Turtle and Midland Painted Turtle identification and habitat characteristics. Stockpiled topsoil, sand, and/or gravel must be completely encircled with silt fence or completely covered with geotextile to prevent turtles from accessing and nesting in the materials from May 15 to July 15 of any year.
4.0	**Species at Risk (SAR)** • Potential for species at risk (SAR) habitat within or adjacent to the study area, and potential interactions with wildlife during construction • SAR and non-SAR Bat species identified in the study area.	MTO MNR MECP	4.1	Bat acoustic surveys confirmed the presence of non-SAR and SAR bats within the Study Area at all eleven (11) acoustic detector locations. Based on data obtained during field surveys and subsequent analysis, it was identified that harm to bat SAR (specifically migratory species) habitat could not be avoided and therefore a permit would be needed.
			4.2	The following mitigation measures are recommended to lessen the likelihood of impacts to bats and will be updated following consultation with MECP on any permitting and compensation requirements for SAR: • Time tree removals to occur between October 1 to March 31 which is outside of the active period (April 1 to September 30). • Avoid installing light figures (permanent or temporary) near bat habitat to lessen the likelihood of effects of light pollution. If not feasible, efforts to reduce illumination and light spill shall consider the following: height of light, light shields, lighting intensity, direction, and spectral composition. • Installation of artificial bat boxes (e.g., Rocket Boxes and BrandenBarkTM roosts) will be considered in areas with SAR bats and adjacent to edges within retained vegetation. A recommended artificial roosting structure design is the two-chamber Rocket Boxes that can accommodate an average of 250 bats. • Potential cavity trees to be retained shall be identified and their root zone protected by clearly demarcating vegetation clearing/construction limits within the dripline,
			4.3	An Information Gathering Form (IGF) is recommended for submission through MECP at the detailed design stage to initiate the approval process under the ESA for bat SAR and to confirm absence for Butler's Gartersnake.
			4.4	The Contractor will ensure all SAR sighted or encountered are protected and avoided if under immediate threat from construction activities.
			4.5	If impacts cannot be avoided through design, appropriate mitigation measures will be developed as required in accordance with the most up to date legislation at that time, including any applicable approvals under the *Endangered Species Act*.
5.0	**Migratory Birds and Protected Nests** • Potential for protected birds to establish nests on existing structures. • Cliff Swallow and Barn Swallow nests (as well as older, unidentifiable swallow nests) were observed on structures in the Study Area. Cliff and Barn Swallow nests, and their habitat	MTO MECP	5.1	Any work near active bird nests has the potential to disturb nesting behavior or damage/destroy the nests, particularly if vegetation clearing occurs during the active breeding bird window (i.e., April 1 - August 31). Tree removal is recommended to occur outside of this breeding bird timing window, as outlined in other sections.
		MTO MECP	5.2	If construction activities are timed to take place within the Migratory Bird nesting period (April 1 to August 31), inactive Barn and Cliff Swallow nests that have the potential to be damaged or destroyed on the structure must be removed prior to commencement of construction and prior to April 1. Deterrents or other preventative measures (e.g., tarping of the structure or culvert) may be applied prior to the Migratory Bird nesting period to reduce potential for Cliff and Barn Swallows to return to nest locations during active construction.
		MTO MECP	5.3	If vegetation removal must take place during the core nesting period and the area is small enough to be effectively searched for nesting birds, then a breeding bird survey can be completed by a Qualified Biologist. The area where vegetation is to be removed must be searched within 48 hours prior to the work commencing. If breeding pairs are located, then they will be protected with a buffer until the nest is no longer active.

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	(i.e. nesting structures) are protected from harm or harassment under general habitat regulations of the MBCA.	MTO MECP	5.4	If an active nest is observed during construction, a designated buffer will be delineated within which no activity will be allowed to occur while the nest is active (i.e., with eggs or young). The radius of the buffer will be determined by a Qualified Professional. Once the nest is determined to be inactive (e.g., the young have fledged the nest), clearing and other activities in the area may proceed.
	• A Downy Woodpecker nest was observed in the THDM3 community along Highway 401, near the Hurley Relief Drain at the western extent of the Study Area.	MTO MECP	5.5	A nest sweep of the THDM3 community where the Downy Woodpecker nest was observed is required to determine if the nest is active prior to any vegetation removal.
6.0	**Erosion and Sedimentation** • Erosion and sedimentation during activities associated with construction have the potential to impact drainage ditches within the study area • The study area had an overall low to high erosion and sediment risk rating based on the erodibility soils and sensitive environmental features.	MTO MNR MECP	6.1	A comprehensive Erosion and Sedimentation Control Plan will be developed prior to construction. Erosion and sedimentation control measures will be implemented in accordance with the Contract Documents to avoid or mitigate impacts to adjacent habitats, and property inside or outside of the right-of-way. It is understood that Approach 3: Main and Supplemental Erosion and Sediment Control Plan (ESCP)will be implemented for the study area during future design phases, in accordance with MTO Guidelines. This approach includes a technical memo, ESC Drawings and contract documents corresponding to MTO non-standard special provisions (NSSPs). The additional component of the Approach 3 method requires the contractor to develop a supplemental ESCP. Selection of Best Management Practices will be completed during detailed design. The BMPs are subject to change during construction and should be evaluated and applied through each phase of construction for successful mitigation of on-site erosion potential. The standard grading treatment includes 2:1 maximum fore-slopes and back-slopes for cuts and high fills. However, given the anticipated erodibility of the soils in the study area, maximum slopes of 3:1 are recommended for preliminary design purposes. The flatter slopes will better control sheet drainage velocity and quantity when compared to standard 2:1 slopes, which will help mitigate erosion of the cut and fill slopes. Interceptor ditches can also be implemented along or at the base of slopes to discharge sediment laden water to areas where erosion and sediment control measures are present. The grading cross-sections and erosion and sediment control measures will be confirmed during future design phases.
			6.2	At minimum, the Best Management Practices set forth in the Environmental Guide for Erosion and Sediment Control During Construction of Highway Project will be followed.
			6.3	The limits of construction (site boundaries) adjacent to all natural areas will be flagged and/or fenced prior to construction and monitored during construction (along with erosion and sediment control measures).
			6.4	No equipment will be permitted to enter any natural areas beyond the sediment fencing (site boundaries) during construction. Equipment arriving on-site will be inspected inside and out prior to entering the site for debris such as mud or accumulation of dirt, plant material or snow/ice. Silt fencing and/or barriers are recommended along the Work Zone where there is potential for sedimentation of watercourses or wetlands, or inadvertent encroachment of construction vehicles into natural areas of woodlands, wetlands, and watercourses.
			6.5	All materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept a safe distance from any sensitive natural features.

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			6.6	All exposed soil areas will be stabilized and re-vegetated. Native seed and mulching, or seed and an erosion control blanket will be applied to disturbed sites promptly upon completion of construction activities. Introduce seed to disturbed substrates as soon as feasible following construction, and sediment fencing is recommended to remain in place until vegetation cover is re-established.
			6.7	Refueling of equipment will be carried out away from any sensitive natural features to avoid potential impacts, in the event that an accidental spill occurs.
			6.8	In addition to any specified requirements, additional sediment fence will be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
			6.9	All sediment and erosion controls will be monitored regularly and properly maintained, as required. Controls will be removed only after the soils of the construction area have been stabilized and vegetation cover is re-established.
			6.10	Any natural areas that are temporarily disturbed for access or construction will be restored to natural self-sustaining conditions.
			6.11	Environmental controls will be monitored by an environmental inspector.
7.0	Management of Invasive Species	MTO MNR MECP	7.1	The invasive common reed (Phragmites) is a ‘restricted’ plant species regulated by the Ontario Invasive Species Act (2015), and under the Act it is illegal to import, deposit, release, grow, buy, sell, lease, or trade this species. Phragmites is present throughout the existing ROW, a clean equipment protocol is recommended for machinery entering riparian areas to prevent the spread of invasive species into the feature.
			7.2	Develop a site-specific Invasive Species Management Plan that will outline procedures for management, removal, and disposal of invasive Phragmites.
			7.3	The Contractor shall adhere to the requirements of special provision No. ENVR0011 - Requirements for Herbicide Spraying and Mechanical Cutting of Invasive and Noxious Vegetation Species (MTO 2019).
			7.4	Herbicide spraying shall not occur in areas with standing water. All locations shall be inspected for standing water prior to spraying in accordance with section 7.02 of special provision no. ENVR0011. Spraying can only commence when water is no longer present.
			7.5	Locations to be treated by cutting shall be cut to a height of 30 cm or less unless otherwise specified or directed by the Contract Administrator per section 7.04 of special provision no. ENVR0011.
			7.6	The Contractor shall implement the Clean Equipment Protocol for Industry (Halloran et al. 2013) to reduce the likelihood of the introduction and spread of invasive species.
			7.7	Designated areas for equipment cleaning and invasive species stockpiles may be temporarily required during construction. If designated areas are required, they will be identified and demarcated in the field. The designated areas will not be located in or near watercourses, environmentally sensitive features, or areas where invasive species are not currently present.
			7.8	Soil contaminated with invasive species will not be re-used for restoration activities.
8.0	**Fish and Fish Habitat** • Potential for changes to direct fish habitat in the study area, and works adjacent to waterbodies have the potential to impact fish and fish habitat.	MTO DFO MECP	8.1	Undertake a Fisheries Assessment (i.e., Impact Assessment) to determine the potential for the death of fish or harmful alteration, disruption, or destruction (HADD) of fish habitat based on the final design of the project. Opportunities for habitat enhancement will be reviewed during the subsequent phase of the project to determine how these measures may be incorporated into the final design.

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				The in-water construction window for watercourses in the study area is July 16 to March 14, inclusive (i.e., in-water work is not permitted from March 15 to July 15) (MNRF 20232db). The timing window does not apply to work above the high-water level. Applicable Ontario Provincial Standard Specifications will be identified and incorporated into the Contract Documents during the subsequent phase of the project. These aspects of the Recommended Plan will require review by Fisheries and Oceans Canada (DFO) to determine the need for a Fisheries Act authorization during the subsequent phase of the project.
	Channel realignment, new proposed culvert and culvert extensions may be required	MTO DFO MECP	8.2	Fluvial geomorphology field studies are recommended during Detail Design to support channel realignment, culvert extensions and new culvert proposed works to help inform the Fisheries Assessment and DFO review for Little River Drain, 9th Concession Drain, and Watson Drain.
Socio-Cultural and Economic Environment				
9.0	**Land Use and Property** • Potential direct and indirect impacts to adjacent properties, including disruption during construction • Temporary delay or disruption to EMS providers during construction	MTO MUN	9.1	Maintain access to private entrances and sideroads during construction, or provide a detour during construction.
			9.2	Notify the public, Indigenous communities, and associated emergency service providers (e.g., OPP, fire department, and ambulance) of the start of the next stage of design, construction staging, start of construction, etc., to minimize delays in emergency response times during and after construction. In addition, consult with agricultural operators to ensure appropriate access to their farmland is maintained throughout the project.
			9.3	Maintain liaison/coordinate construction with responding agencies (including school boards).
			9.4	Engage with impacted property owners to discuss and confirm impacts as a result of Concession Road 9 structure replacement plan during detail design.
			9.5	Establish and confirm construction staging and laydown areas.
			9.6	Prepare a detailed Traffic Management Plan.
			9.7	Prepare Conceptual Landscape Plan and obtain input on plan during detail design.
	Subsurface Contamination • Four Areas of Potential Environmental Concern were identified within the study area (records of historical spills, importation of fill materials of unknown quality, and gasoline storage)	MTO	9.8	A Preliminary Site Screening (PSS), Phase I ESA and Phase II ESA (if recommended as part of the PSS or Phase I ESA) should be completed for any property that will be acquired by MTO in accordance with the requirements of the MTO documents Environmental Guide for Contaminated Property Identification and Management (MTO, 2006) and Environmental Reference for Highway Design (MTO, 2013). If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition.
	Management of Excess Materials • Excess materials may be encountered during construction at the sites and require proper management/disposal	MTO MECP	9.9	Excess materials generated during construction will be managed in accordance with O.Reg. 406/19. All materials and debris will be removed upon completion of the work, in accordance with O.Reg. 406/19. This includes sampling soil that is intended to be excavated prior to or during construction that may require off-site management as excess soil. The soil sampling program will be undertaken according to a sampling and analysis plan, and analyses will be performed for the specific contaminants of potential concern, as described in the APEC summary table. Sampling programs should be developed and undertaken under the supervision

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				of a qualified person as defined in O.Reg. 406/19 and sample selection should take into consideration the presence of anthropogenic substances such as debris/waste, and unusual odours or staining. Stockpiling and transport of excavated soil and sediment during construction should be done in accordance with the requirements specified in O.Reg. 406/19.
10.0	**Construction Noise** • Potential noise increase during construction associated with some equipment (e.g., boom trucks, pile drivers, dump trucks and paving machines)	MTO MUN RES/BUS PUB	10.1	Most equipment can operate in compliance with the MECP NPC-115/118 limits. However, some equipment, such as air compressors, paving machines, pavement breakers, and impact pile drivers may generate noise levels exceeding the permissible limits. Once equipment and construction schedules are finalized, construction equipment sound levels will be reviewed to confirm that nose emissions are within the permissible limits. If higher than permissible limits, noise control options will be explored.
			10.2	All equipment will be properly maintained to limit noise emissions. As such, all construction equipment will be operated with effective muffling devices that are in good working order.
			10.3	The contractor will be required to adhere to standard noise restrictions (i.e., proper maintenance of equipment, no unnecessary idling) and with all applicable requirements outlined in the Contract Documents.
			10.4	Noise complaints should be addressed in accordance with the MTO Guide. The Contract Documents will contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to are in effect. This includes conducting field investigations to measure noise levels and requiring contractors to comply with the sound level criteria in MECP NPC-115 and NPC-118 guidelines.
			10.5	In the presence of persistent noise complaints, all construction equipment will be verified to comply with MECP NPC-115 guideline.
			10.6	In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measured may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration will be given to the technical, administrative and economic feasibility of the various alternatives.
11.0	**Archaeological Resources** • Previously unknown/deeply buried artifacts/human remains could be uncovered during construction	MTO MCM	11.1	A Stage 1 Archaeological Assessment was completed for this project. Areas of Stage 2 archaeological assessment were identified, and areas of impact will be confirmed based on the final project design. Conduct a Stage 2 Archaeological Assessment during the detailed design phase to ensure proper identification and management of potential resources.
			11.2	Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act (Government of Ontario 1990b). The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the Ontario Heritage Act (Government of Ontario 1990b). The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.
12.0	**Air Quality** • Potential for dust from construction activities to adversely affect nearby land uses	MTO MECP RES/BUS PUB	12.1	The Environment and Climate Change Canada's Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities will be followed. At minimum, best practices during construction will include material wetting or use of chemical suppressants to reduce dust, use of wind barriers and limiting exposed areas which may be a source of dust, and equipment washing.

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	• Particulate matter and gaseous emissions during			Additional measures to mitigate the impacts of particulate matter and gaseous emissions may include the integration of vegetative barriers into the landscaping design. The effectiveness of vegetation as a physical barrier for air contaminant control depends on the density, height, and structure of the planting. Effective vegetative barriers are typically at least 6 metres thick, with dense foliage and continuous leaf and branch coverage from the ground to the top of the canopy, without gaps at the base or within the structure. Evergreen species are generally more effective than deciduous trees for this purpose, and the barrier should be located as close as possible to the emission sources (U.S. EPA 2016).
13.0	**Utilities** • Impacts to existing utilities during construction	MTO UTL	13.1	Utilities will be contacted during next stage of planning and design to confirm location of existing utilities and potential conflicts.

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12.0 Monitoring

The planning and preliminary design phase of the project is now complete. Specific mitigation measures identified in this report will require confirmation during the next design phase and monitoring during construction.

Monitoring will be conducted by on-site construction supervisory staff to make sure that environmental protection measures, as outlined in this report and confirmed during subsequent design phases, and included in the contract package, are implemented. This includes making sure that the implementation of mitigating measures and key design features is consistent with commitments made to external agencies prior to construction.

For certain activities, monitoring by a Qualified Environmental Specialist will be required.

In the event that protective measures do not address concerns identified or if major problems develop, the appropriate agency will be contacted to provide additional input.

In the event that the impacts of construction are different than anticipated, or that the method of construction is such that there are greater than anticipated impacts, the Contractor’s method of operation will be modified to reduce those impacts.

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APPENDIX A:
Notification Materials

APPENDIX B:
Public Information Centre Materials

APPENDIX C:
Public and Agency Correspondence

APPENDIX D:
Recommended Plan