

Study Design Report

Centennial Road (CR 28) / Elm Line (CR 56) Intersection Improvements Municipal Class Environmental Assessment

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Submitted by: BT Engineering Inc.
509 Talbot Street
London, ON N6A 2S5



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1.0 Introduction

The County of Elgin (County) has initiated a Class Environmental Assessment (EA) Study to develop a transportation plan for intersection improvements at Centennial Road (County Road 28) and Elm Line (County Road 56) in the Municipality of Central Elgin. Intersection improvements are required to improve the operation, safety and capacity of the existing intersection configuration. The Study will consider alternatives for intersection improvements which may include but is not limited to road realignment, the installation of traffic signals, or a roundabout as described in this report.

This report, the initial public document for the Municipal Class Environmental Assessment, presents a description of the work plan, preliminary alternatives, consultation plan and overall study process. It will outline the EA planning process and describe the key activities required to complete the Study. The Draft Study Design will be circulated to various agencies and the Study's Technical Advisory Committee (TAC) and is available to the general public on the County's website.

1.1 Study Area

The Study Area is located in the County of Elgin and is illustrated on **Figure 1**. The Study Area includes the Centennial Road / Centennial Avenue (CR 28) and Elm Street / Elm Line (CR 56) intersection. For the purposes of this report Centennial Road and Elm Line will be used to describe the roadways. This intersection is located within the Municipality of Central Elgin at the eastern boundary limits of the City of St. Thomas.

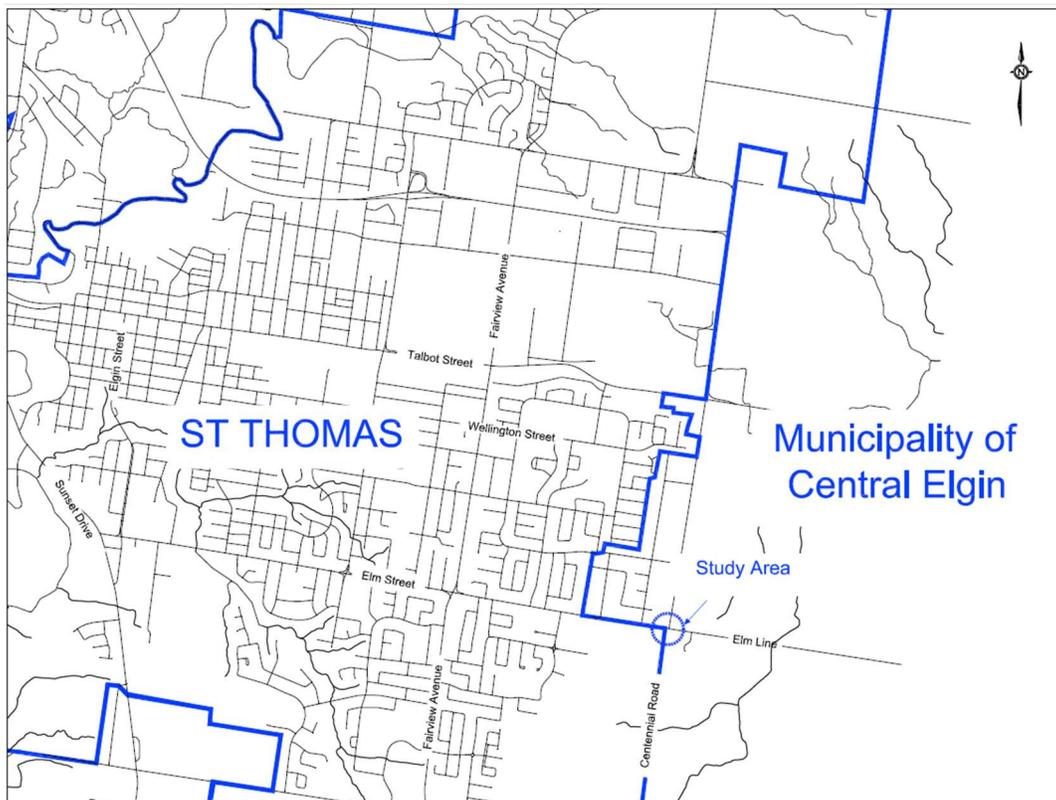


Figure 1: Project Location

1.2 Study Background

Intersection improvements at Centennial Road / Elm Line are required to accommodate planned and future development within the Municipality of Central Elgin and the City of St. Thomas. Centennial Road / Elm Line currently operates as a 4-legged intersection with the north and south approaches offset by approximately 25 m. The north and south approaches are Stop controlled, and all legs of the intersection have single-lane approaches with exception of the north leg which has a dedicated southbound left-turn lane.

Centennial Road and Elm Line are 2-lane rural roadways providing access to residential, agricultural and commercial properties as well as connecting the County to the City of St. Thomas and the wider transportation network. The roadway serves all modes of travel including vehicular traffic, goods movement, cycling and pedestrians. A sidewalk is provided on the west side of Centennial Avenue (north leg of the intersection). All road approaches have a posted speed of 50 km/h with exception of Centennial Road (south approach) which has a posted speed of 60 km/h.

1.2.1 Background Studies

Background studies have been completed within the Study Area to document the proposed land uses and transportation networks. These reports are summarized in the following sections.

1.2.1.1 Official Plan and Land Use

The County of Elgin Official Plan (2015) provides “a policy framework for managing growth and land use decisions”. The County of Elgin provides guidance to the lower tier municipalities through the Official Plan, Official Plan Amendments and Zoning By-laws for the establishment of strategies, policies and land use designations. The County of Elgin Official Plan describes the Study Area as follows:

- Tier 1 Settlement Area (see Schedule A of the County’s Official Plan): These settlement areas have the largest populations and are fully serviced.
- Elm Line is identified as a County Collector road and Centennial Avenue is identified as a suburban link. This intersection is identified for “County Future Intersection Improvements” in the Official Plan (see Schedule B of the County’s Official Plan).

The Municipality of Central Elgin Official Plan (2013) describes policies to promote sustainable development and to ensure transparency in the decision-making process. The Municipality of Central Elgin Official Plan describes the Study Area as follows:

- Eastwood Urban Settlement Area (see Schedule 1 of the Municipality’s Official Plan). This area is a focus of urban growth in Central Elgin.
- Residential Land Use (see Schedule D of the Municipality’s Official Plan). These are the main locations for housing in Central Elgin and are fully serviced.

Section 2.8.5.1.1 of the Municipality’s Official Plan indicates that vehicular transportation will continue to be the dominant mode of transportation in the Municipality; however, alternative modes of transportation are encouraged in Urban Settlement Areas.

1.2.1.1.1 Development

Several traffic impact assessments were prepared in support of development of the lands adjacent to the Study Area. These reports and the planned development are summarized in this Section.

Harvest Run Subdivision: This planned 150 acre subdivision is located in the southwest quadrant of the Centennial Road/Elm Line intersection and includes 1150 dwelling units and a 1.3 hectare commercial/retail block. A Traffic Impact Assessment (TIA) was completed in 2016 and identified several alternatives for intersection control including:

- All-way stop with realigned north/south approaches and a channelized southbound right-turn lane
- Signalization with left-turn lanes on all approaches and a southbound right-turn lane
- Single-lane roundabout

Based on a preliminary review, the TIA recommended signalization of the intersection; however, signals were not warranted based on the volumes used in the 2016 report.

1.2.1.2 Active Transportation

The Elgin-St. Thomas Cycling Master Plan (2014) identifies Elm Line and Centennial Road as Active Transportation Routes. These recommendations include:

- A proposed signed route along Elm Line connecting the City of St. Thomas to Oxford County and Tillsonburg. Elm Line is also identified as part of the Trans Canada Trail.
- A proposed multi-use path along the southern leg of Centennial Road connecting the Southwest St. Thomas Area to Elm Line and the proposed network of trails.

2.0 Need and Justification

2.1 Problem and Opportunity Statement

Improvements are required to the Centennial Road and Elm Line Intersection as a result of development within Central Elgin and the City of St. Thomas. A transportation management plan is required to identify alternatives that will consider the operation and safety of all modes of transportation including vehicular traffic, pedestrians, cyclists and equipment.

The Study will provide the opportunity to: improve the approach geometry and operational capacity of the intersection to provide a safe link for all road users; define a transportation management plan to support travel within the County; and implement active transportation facilities that meet AODA consideration and compliance.

2.1.1 Alternative Planning Solutions

The Class Environmental Assessment Act requires that all reasonable and feasible Planning Solutions be identified and evaluated at the start of the Study. These alternatives consider the overall needs of the study area and identify alternative approaches of addressing the need for improvements. The analysis and evaluation of Alternative Planning Solutions for this Study are summarized as follows:

1. Do Nothing – The Do Nothing Alternative must be considered as mandated by the Class EA. It represents a baseline from which other approaches can be compared. This alternative would maintain the existing offset intersection.
 - ✓ No cost
 - ✓ No property or environmental impacts
 - ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
 - ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)
 - ✗ Does not provide improved active transportation facilities

2. Transportation Demand Management (TDM) – This strategy would reduce vehicular demand and encourage alternative work hours, work at home, more active modes of transportation (cycling and walking) and the use of transit.
 - ✓ No cost
 - ✓ No property or environmental impacts
 - ✓ Reduces vehicular traffic demand
 - ✗ Limited active transportation facilities and no transit is provided through the study area
 - ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
 - ✗ Does not provide a permanent long-term solution for intersection control (level of

service and capacity will deteriorate as the adjacent subdivisions are developed)

3. Limit Development – This strategy would limit any new residential, commercial or industrial development and therefore reduce the generation of new trips.

- ✓ No cost
- ✓ No property or environmental impacts
- ✓ Reduces generation of new trips

- ✗ Does not align with the Official Plan or the Provincial Policy Statement for land use planning
- ✗ Does not account for growth in background traffic or previously approved developments
- ✗ Does not address existing safety concerns (i.e. sight lines, operating speeds, turning radii and offset)
- ✗ Does not provide a permanent long-term solution for intersection control (level of service and capacity will deteriorate as the adjacent subdivisions are developed)
- ✗ Does not provide improved active transportation facilities

4. Intersection Improvements – Intersection improvements to improve geometry and capacity of the intersection.

- ✓ Improves safety for road users
- ✓ Provides long-term solution for improved capacity and operations
- ✓ Provides opportunity for improved active transportation facilities
- ✓ Aligns with the County's plan for growth and development

- ✗ Medium to high cost
- ✗ Requires property acquisition
- ✗ Minor impacts to the natural environment

The Alternative Planning Solutions have been evaluated to select the most reasonable alternatives that address the Problem and Opportunity Statement. Based on the preliminary review of Alternative Planning Solutions, “Intersection Improvements at Centennial Road/Elm Line” is recommended. This Planning Solution adequately addresses the transportation problem by improving safety and addressing future capacity constraints. Property acquisition will be required to accommodate the realignment of the offset north and south legs of the intersection.

The Preliminary Recommendation for Alternative Planning Solutions is referred to in this Draft Study Design as “Improvement of the Existing Intersection” and will be presented at the Public Information Centre (PIC) for public and stakeholder feedback. This recommendation is consistent with the County's Official Plan.

3.0 Study Process

This Study will be conducted as a Municipal Schedule B or C Class Environmental Assessment Study meeting the requirements of the Municipal Class Environmental Assessment. The study will culminate in the filing of a Project File or Environmental Study Report (ESR).

The Schedule will be confirmed based on the requirements of the Class Environmental Assessment document. This project will be considered either “reconstruction or widening where the reconstructed road or other linear paved facilities will not be for the same purpose, use, capacity or at the same location” or “construction of new roads or other linear paved facilities”. Both of these projects will be considered as Schedule B if the cost is less than \$2.4 million, and as Schedule C if the cost is greater than \$2.4 million.

This Study will complete all requirements under the Municipal Class EA by establishing the need and justification for the project, considering all reasonable alternatives with acceptable effects on the natural, social and cultural environments, and proactively involving the public in defining a preferred design.

3.1 Guiding Principles

The study approach reflects the following Ministry of the Environment, Conservation and Parks (MECP) five guiding principles for EA studies, namely:

- Consider all reasonable alternatives;
- Provide a comprehensive assessment of the environment;
- Utilize a systematic and traceable evaluation of net effects;
- Undertake a comprehensive public consultation program; and
- Provide a clear and concise documentation of the decision-making process and the public consultation program.

3.2 Environmental Assessment Act Requirements

The Environmental Assessment will follow the Class EA process, thereby meeting the requirements of the Municipal Engineer Association’s Municipal Class Environmental Assessment (2000 as amended in 2007, 2011 and 2015). The Study is being initiated as a Municipal Schedule B or C project based on the range on anticipated effects and capital cost of the project.

The Schedule B or C project will include a public meeting and conclude with the preparation of a Project File or Environmental Study Report (ESR). The public will be provided with a 30-day review period at the Study conclusion.

As the initial step in the Class EA process this Study Design Report is being made available to the public. This satisfies discretionary Step 1.2 of the Municipal Class EA process, as illustrated in **Figure 2**. The public and agencies will have this initial opportunity to comment on the proposed approach.

3.3 EA Phases

The Municipal Class EA Process is illustrated in **Figure 2**. The following is the breakdown of tasks, by phase, for a Municipal Schedule B project:

Phase 1: Identify the Problem

- Step 1: Identification and description of the problem or opportunity.
- Step 2: Discretionary public consultation (Study Design available on the County's website).

Phase 2: Alternative Solutions

- Step 1: Identification of alternative solutions to the problem.
- Step 2: Identify the study area and a general inventory of the natural, social and cultural environments.
- Step 3: Identification of the net positive and negative effects of each alternative solution.
- Step 4: Review and validation of alternative solutions.
- Step 5: Identification of reasonable design alternatives for the preferred solution.
- Step 6: Public consultation at PIC No. 1.
- Step 7: Confirmation of design alternatives and refinements to or addition of design alternatives.
- Step 8: Selection of the preferred solution, following the public and agency review.
- Step 9: Completion of the Project File and 30-day public review period.

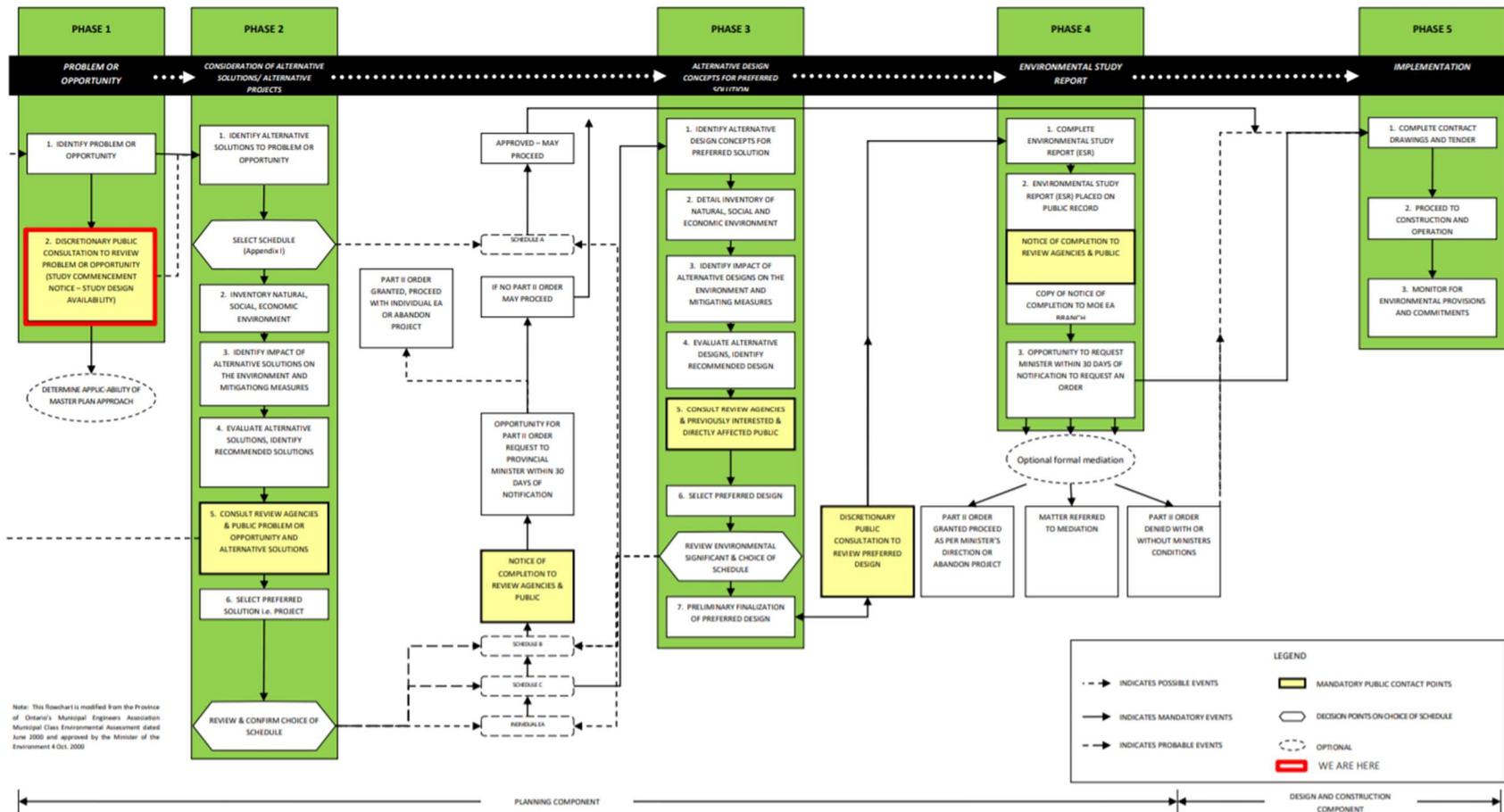


Figure 2: Municipal Class EA Process

4.0 Study Approach

Over the course of the study, input will be solicited from the public, stakeholders, agencies and Indigenous Communities. Input will be gathered through meetings, the project website, and discussions/communication with interested parties. The Study approach is to work collaboratively with interested parties to address issues and reach a consensus on the preferred design.

4.1 Consultation Program

The Consultation Program provides opportunities for the TAC to discuss the Study with the public/stakeholders, agencies and Indigenous Communities. This Study will use several processes to engage with interested parties and provide an opportunity for input. The Consultation Program will include:

- Notices published in local newspapers and directly mailed/emailed to the study mailing list at key points over the course of the study including:
 - Notice of Study Commencement at the Study start-up
 - Public Information Centre No. 1 (during the EA process)
 - Notice of Study Completion to account the start of the 30-day public review period
 - Public Information Centre No. 2 (during detail design)
- Communication and coordination with agencies/consultants to obtain background information for input into the Study and to obtain required approvals/permits
- Study updates on the project webpage located on the County's website
- Project Team Meetings
- Meetings with regulatory agencies, affected parties and stakeholders (as required)

4.1.1 Public Consultation

The study will use several techniques to proactively involve the public including this Study Design Report, Public Information Centres (PIC) and meetings with external stakeholders. Meetings will be organized with the stakeholders and may include affected agencies. These meetings will include representatives from the County and the consultant team.

One Public Information Centres (PIC) will be held as part of the EA process. This PIC will present the problem and opportunity statement, Study Design (Work Plan), environmental inventories, traffic analysis, evaluation of design alternatives and the preferred solution for the Study Area. The PIC will provide an opportunity to receive public/agency input before the preferred solution is finalized and documented in the Project File.

The public meeting will be an integral component of the study - seeking input and comments from the public and stakeholders. There will be an opportunity for the public to comment on the study at any time. All information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act* (2009). Anyone interested in the study will be added to the study mailing list upon request.

4.1.2 Agency Consultation

Agencies/Ministries will be contacted at the start of the study to inform them of Study Commencement and to circulate this Draft Study Design. As the study progresses, meetings will be held with select agencies (as required) to review the study and obtain approvals in accordance with the Municipal Class EA. Agencies will include:

- Ministry of the Environment, Conservation and Parks
- Ministry of Natural Resources and Forestry
- Ministry of Indigenous Affairs
- Ministry of Heritage, Sport, Tourism and Culture Industries
- Kettle Creek Conservation Authority
- City of St. Thomas
- Municipality of Central Elgin
- Infrastructure Ontario
- Transport Canada
- Emergency Services
- School Boards/Bus Services
- Other Stakeholders (as identified)

4.1.3 Indigenous Consultation

The County of Elgin has a constitutional duty to consult with Indigenous Communities with traditional land use or interests within the Study Area. Clear, effective and timely consultation with Indigenous Communities is essential to ensure the success of the project. This will include:

- Identification of interested/affected Indigenous Communities early in the decision-making process;
- Distribution and notification of relevant project-related information, including the Class EA process, environmental inventories and potential alternatives/impacts;
- Early identification of concerns/issues;
- Understanding of potential risk and impacts of the Study on Indigenous Peoples interests;
- Development of mutually acceptable solutions involving Indigenous Communities; and
- Ensuring regulatory compliance throughout the Class EA process.

Indigenous Communities will be consulted throughout the duration of the Study.

4.2 Work Program

The major elements of the work program are described in the following sections.

4.2.1 Phase 1: Identify the Problem

This phase of the Study will include: establishing the Study scope, schedule and approach with the Project Team and agencies; issuing the Notice of Study Commencement; the collection and organization

of background information; reviewing and documenting existing conditions; and the transportation analysis to identify operational, safety and traffic concerns.

In addition, this draft Study Design has been prepared to present: the Problem/Opportunity Statement; the consultation plan; project schedule; and the scope of the Study's technical requirements, design standards and proposed evaluation criteria. This document is available for public/agency review and will help establish the foundation for all remaining environmental planning and public consultation processes.

4.2.2 Phase 2: Alternatives

Alternative Planning Solutions

The list of Alternative Planning Solutions is provided in **Section 2.1.1**. Based on this evaluation, a context sensitive design approach that reflects the surrounding area will be used in the development and evaluation of alternative intersection improvements.

The consideration of all reasonable alternatives is a guiding principle for EA studies. Intersection alternatives will be generated through discussions with the County, agencies/stakeholders and the general public.

Preliminary Design Alternatives

This Section describes Preliminary Design Alternatives for the recommended Planning Solution for Intersection Improvements (see **Section 2.1.1**). The Environmental Assessment will identify the preferred alignment and intersection control at the Centennial Road/Elm Line intersection.

As an initial step in the generation of alternatives this Study has identified alternative intersection improvements. These include:

- Alternative 1: Unsignalized Conventional Control
 - All-way Stop Control
 - Speed Control (traffic calming)
 - Realignment (70-degree skew angle)
 - Realignment (gooseneck sideroads to achieve 90-degree skew angle)
- Alternative 2: Signalization
 - Realignment (70-degree skew angle)
 - Realignment (gooseneck sideroads to achieve 90-degree skew angle)
 - Pedestrian Signals
- Alternative 3: Roundabout Control

These alternatives will be evaluated, and the preferred solution will be presented at the Public Information Centre.

4.2.3 Environmental Inventories and Technical Investigations

Environmental inventories and technical investigations will be completed to assess the impacts of alternative design concepts. These investigations are described in **Sections 4.2.3.1 to Section 4.2.3.5**.

4.2.3.1 Transportation Analysis

The transportation analysis will build upon the previous work that has been completed. An analysis will be undertaken of the operational implications of existing and projected traffic demands and the distribution of traffic resulting from the planned developments. The transportation analysis will involve the following key tasks:

- Documentation of the existing profile of road users including all modes of travel (vehicular, bicycles, pedestrians, equipment, transit and emergency services);
- Analysis of forecast traffic demands and future projections, and identification of level of service for roadway links and intersections (building and documenting on previous forecasts) for any planned transportation network changes;
- Examination of area collision histories to identify areas of concern and possible improvement opportunities. This will be documented in the Safety Performance Report;
- Identification of existing /future operational problems and timelines for the need for additional capacity in the transportation network;
- Provide input describing the performance of each alternative (traffic operation and safety); and
- Confirmation of the need and justification for roadway improvements and timing.

4.2.3.2 Natural Environment

An assessment of the trees in the Study Area will be completed to determine if any trees will be impacted by the proposed improvements. This will include preparation of a Tree Inventory and Tree Preservation Report.

4.2.3.3 Socio-Economic Environment

An inventory of existing land uses within the Study Area will be undertaken. This will include documentation of recreational/residential development (access, emergency services, trails, etc.), commercial, institutional and utility corridor land uses. The inventory will also include consideration and identification of future land uses such as developments, right-of-way requirements, future transit and transportation facilities and development that could be implemented complying with existing planning documents. Any land use changes that have occurred will be documented.

4.2.3.4 Stormwater Drainage

The drainage and stormwater management design criteria will be confirmed with the County. Drainage analysis will be performed to determine the flows for the 5 to 100 year return period rainfall events and to establish the capacities of the existing and required system for the preferred solution.

4.2.3.5 Geotechnical

A geotechnical site investigation will be completed including: 8 boreholes taken on the roads approaching the intersection; physical soil testing (natural moisture content, sieve analysis and Sieve/Hydrometer); and a summary of the results of the site investigation and laboratory testing program in a geotechnical report.

4.2.4 Evaluation of Alternatives

Preliminary Design Alternatives will be generated based on the inventory of the natural, social and cultural environment and results of the technical investigations.

Preliminary Design Alternatives will be evaluated using a qualitative or quantitative evaluation process based on the range of alternatives and associated impacts. Through this process evaluation criteria will be identified including potential factors such as roadway level of service, traffic safety, accessibility, property impacts, socio-economic environment, natural environment, cultural heritage, technical aspects/construction complexity and implementation. The evaluation process will assign a “weight” to each criteria and an iterative process will be used for the evaluation of individual competing alternatives. The iterative process will involve one, or possible two levels of evaluation and sensitivity testing.

The evaluation and analysis will identify all improvement alternatives and associated cost estimates including life cycle costs, alternative construction/ material options, proposed timeline and innovative solutions.

Based on the results of an evaluation, a preferred solution will be selected. A technical memorandum outlining the results of the evaluation will be completed and will include: the assessment of alternatives to the undertaking; generation and assessment of preliminary design alternatives; evaluation criteria (i.e. environmental inventories and technical investigations); and selection of the preferred solution.

This document will be presented to the public for input at PIC No. 1. Following the PIC, refinements will be made to the preferred solution (if applicable) and the refined alternative will become the preferred design.

4.3 Phase 4: Environmental Study Report (ESR) or Project File

The preparation of the draft and final EA report will follow the format and content for an ESR or Project File accepted by the Ministry of Environment Parks and Conservation (MECP). The ESR or Project File will document the study methodology, findings, public involvement and recommendations. The public will be notified of the availability of the ESR or Project File for a 30-day public review period.

4.4 Study Schedule

A draft schedule for this Study is shown below in **Table 1**.

Table 1: Draft Study Schedule

Task	Date
Project Start-Up Meeting	January 2020
Study Commencement Notice and Study Design	February 2020
Information Gathering	Winter 2020
Environmental Review and Transportation Analysis	Winter/Spring 2020
Analysis and Evaluation of Alternatives	Spring 2020
Public Information Centre No. 1	Spring 2020
Finalize Preferred Design	May/June 2020
Preparation of ESR or Project File	June 2020
30-day Public Review Period	Summer 2020