

# The Corporation of the Town of Innisfil 6th Line Interchange Environmental Assessment Study Design



July 18, 2016

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## 1.0 Study Introduction

### 1.1 Preface

The Town of Innisfil (Town) has initiated this Municipal Class Environmental Assessment (EA) to plan for a new interchange on Highway 400 at the 6th Line. This interchange has been identified in the Town's Official Plan (OP) and Transportation Master Plan (TMP). This current Study will review the previous analysis for the interchange identified in the TMP, validate those conclusions (which should satisfy Phases 1 and 2 of the Municipal Class EA) and then undertake Phases 3 and 4 of the Municipal Class EA for a proposed interchange at 6th Line and Highway 400.

This report is the initial public document for the 6th Line Interchange EA Study. It presents a blueprint of the Work Plan and Study Process for the planning and design of this future transportation project.

### 1.2 Study Area

The project location is within the County of Simcoe and Town of Innisfil as illustrated in **Figure 1**. The Study will provide options for a new interchange in the central area of Simcoe County on Highway 400. Improvements to 6th Line and a new interchange will service the Expansion Area in the Town of Innisfil. The Study Area, illustrated in **Figure 2**, will extend from the 5th Sideroad easterly to approximately 600 m east of Highway 400. A secondary Study Area will consider downstream influences of trips attracted to the new interchange.

### 1.3 Background

#### Town of Innisfil Official Plan

The 2011 OP identified future potential interchanges on Highway 400 as shown in **Figure 3**. The OP identified 5th Line as a

potential interchange coinciding with a potential GO station at the 5th Line and 20th Sideroad intersection.

The Town of Innisfil Official Plan review is in progress and is expected to be finalized by the end of 2016. In this review, the location of the new interchange is being reviewed to consider modifying the previous plan and relocating the proposed interchange from 5th Line to 6th Line. The Transportation Master Plan and this current interchange EA study will provide input into the update of the Official Plan.

#### Town of Innisfil Transportation Master Plan (TMP) 2013

Phases 1 and 2 of the Municipal Class EA that were completed by the TMP involve confirming the need and justification of a set of transportation projects. The Town of Innisfil completed a Transportation Master Plan (TMP) in 2013 that identified both improvements to the 6th Line and an interchange on the 6th Line at Highway 400. This review by the TMP completed the first two phases of the Class EA considering a Regional level analysis of needs.

The 2013 TMP identified the 2031 transit and roadway network requirements based on a specific distribution of population and employment activities within the Town of Innisfil.

The TMP discusses the Ontario Growth Plan for Simcoe County and the identification of the settlement of Alcona, located to the northeast of the Study Area as a Primary Settlement area. Alcona is expected to see the highest population growth of the area and developers intend to build new homes south of Alcona in the development area called Sleeping Lion. The TMP for the Town of Innisfil has recommended revising the Official

Plan to identify 6th Line as a preferred corridor for road improvements and the location for a new interchange with Highway 400, as illustrated in **Figure 4**.

The TMP reviewed potential interchanges on Highway 400 at either the 5th Line or the 6th Line. An interchange at 5th Line will reduce traffic on Innisfil Beach Road and Shore Acres Drive / County Road 89 which are currently the only two roads that connect with Highway 400. An interchange at 6th Line will support future growth and provide better access to Innisfil Heights as well as the Sleeping Lion development in Alcona (if upgrades to 6th Line from Highway 400 to 20th Sideroad are also implemented). This location reduces out-of-way travel in comparison to the 5th Line interchange location. A comment received from the public requested the review of an interchange at 4th Line. These three potential interchange locations are described as the Planning Alternatives.

The assessment of the interchange locations is described in **Section 7.3**.

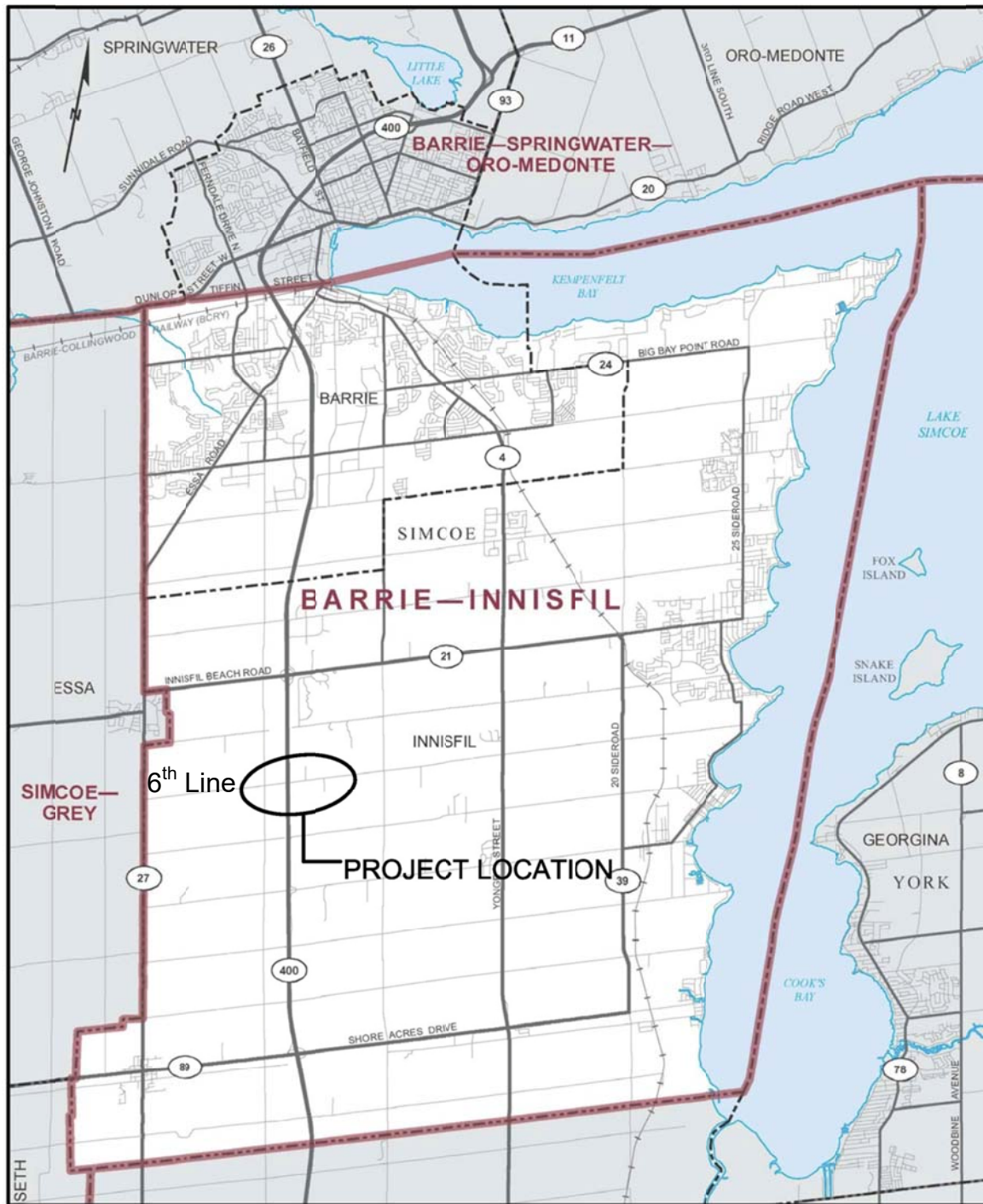


Figure 1: Project Location

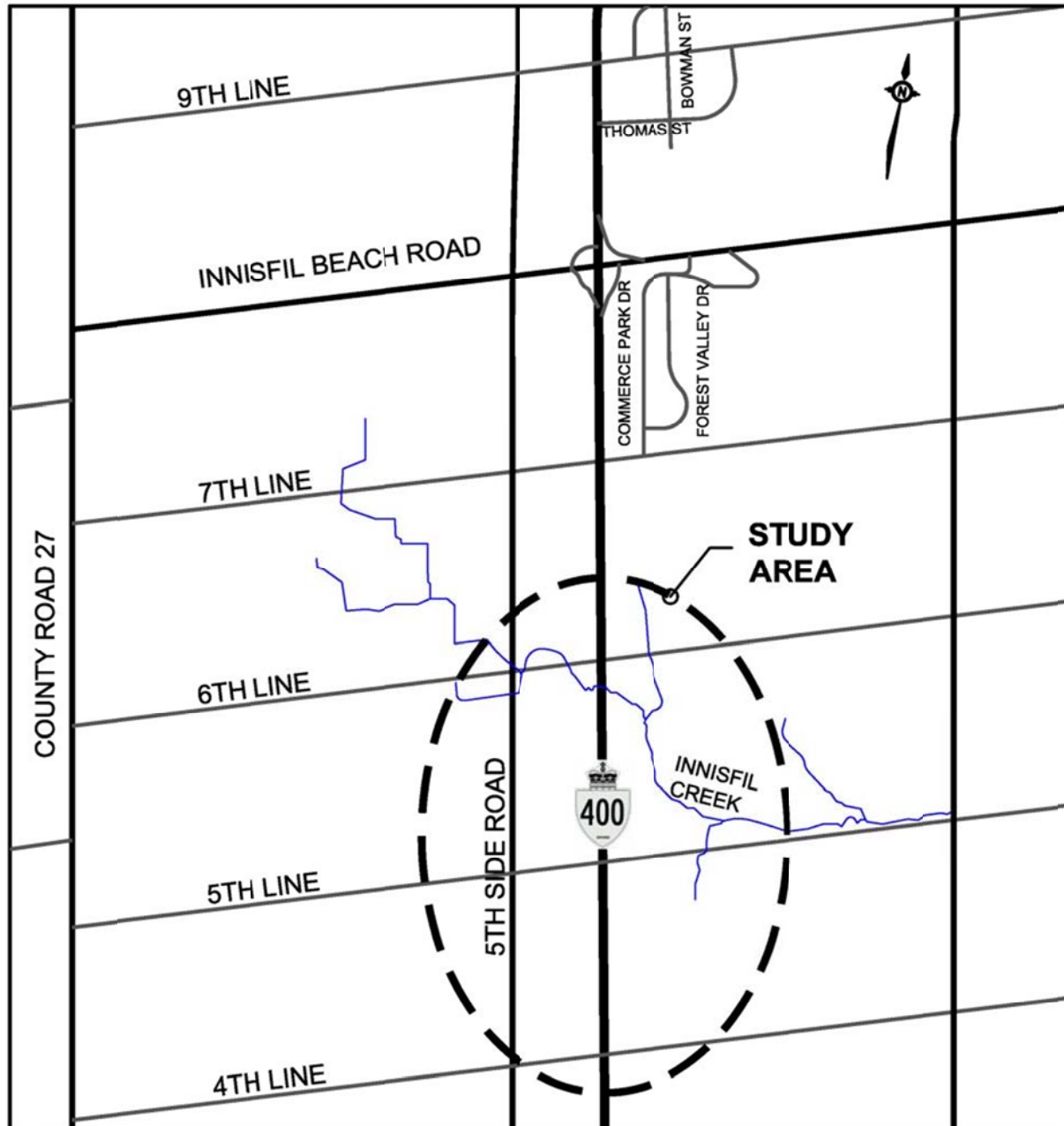
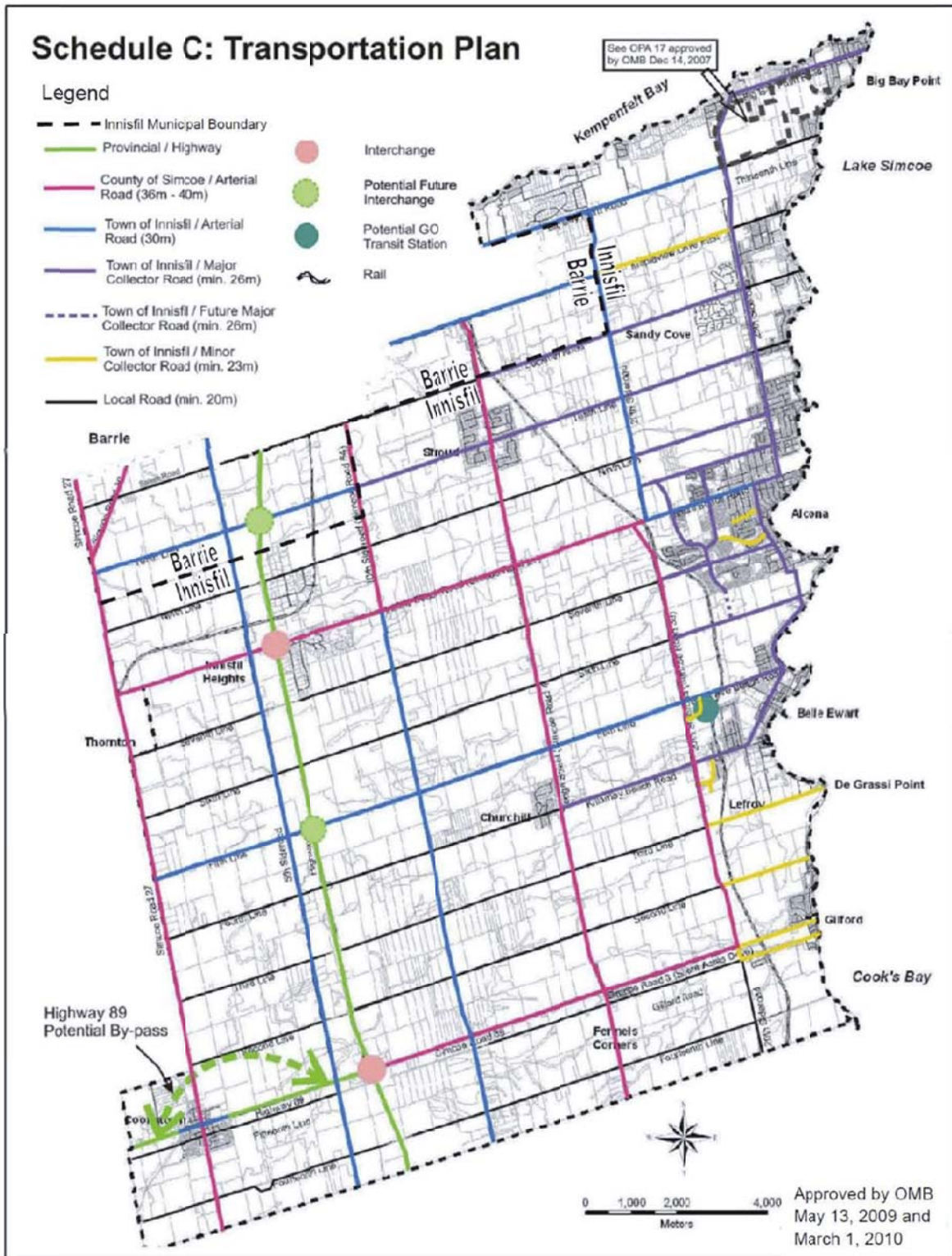


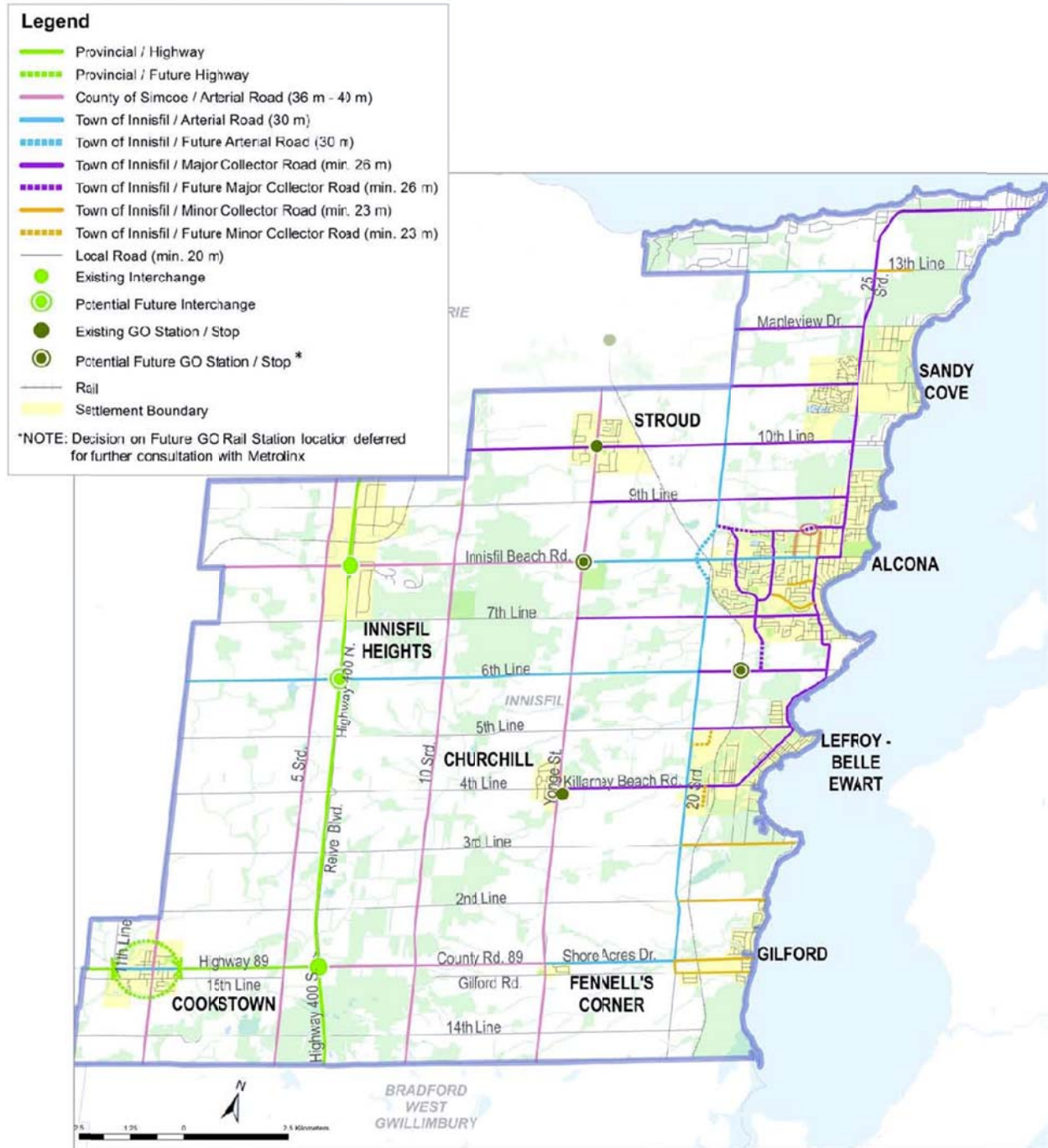
Figure 2: Study Area





**Figure 3: Innisfil Road Classification and Right-of-Way Widths**  
 (Source: Innisfil OP 2006 as approved by OMB 2009, 2010 and 2011)





**Figure 4: Transportation Master Plan (TMP) Recommended Revisions to Official Plan Schedule C – Transportation Network (Source: Innisfil TMP 2013)**

## 2.0 Study Approach

This Study will be completed as a standalone EA study meeting the requirements the Municipal Class EA. The final documentation will be a single Environmental Study Report (ESR).

This project will complete all requirements of a Schedule C project 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 recommended plan for improvements. Should the project trigger federal approvals, the documentation will present recommended mitigation to satisfy federal requirements in principle.

### 2.1 Guiding Principles

The study approach includes the following Ministry of the Environment and Climate Change's (MOECC) 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 clear and concise documentation of the decision-

making process and public consultation program.

## 2.2 Environmental Assessment Act Requirements

The Environmental Assessment will follow a Class EA process meeting the requirements of the Municipal Class EA (amended 2011 and 2015).

Based on the range of anticipated effects and capital cost of the project, the study is being initiated as a Municipal Schedule C project. The Town of Innisfil will be the proponent of the project and will consult with the MTO in regard to all aspects of the Class EA. MTO is the regulatory agency and has Corridor Control within 400 m of the freeway.

This Schedule C project will include two Public Open Houses (POHs) and will conclude with the preparation of an ESR report. Following this approach the public will be provided 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 as the discretionary Step 1.2 in the Municipal Class EA process illustrated in **Figure 5**. The public and agencies will have this initial opportunity to comment on this proposed approach.

## 2.3 EA Phases

### 2.3.1 Municipal Class EA

The Municipal Class EA Process is illustrated in **Figure 5**.

The following is the specific breakdown of tasks by phase for a Municipal Schedule C project:

**Phase 1: Identify the Problem  
(completed by the TMP)**

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

**Phase 2: Alternative Solutions  
(completed by the TMP)**

- 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 considered by TMP and preliminary recommendation of a preferred solution.
- Step 5: Identification of Reasonable design alternatives for the preferred solution.
- Step 6: Public consultation at POH No.1.
- Step 7: Confirmation; finalization of Study Design for work program; and refinements and/or addition of interchange design alternatives to be carried forward for Phase 3.
- Step 8: Selection of the preferred solution, following public and agency review.

**Phase 3: Alternative Design Concepts  
for the Preferred Solution**

- Step 1: Identification of alternative designs.
- Step 2: Preparation of a detailed inventory of the social and economic environments.
- Step 3: Identification of the potential impacts of the alternative designs.
- Step 4: Evaluation of the alternative designs.
- Step 5: Public consultation at POH No. 2.

**Phase 4: Environmental Study Report  
(ESR)**

- Step 1: Completion of the ESR.
- Step 2: 30-day public review period
- Step 3: File the ESR and Notice of Completion.

**Phase 5: Implementation**

Future phase after this Study.

**2.4 Study EA Process**

The Municipal EA process proposed for the 6th Line Interchange EA study documents the extended activities from the Municipal Class EA to meet and achieve the requirements of the Canadian Environmental Assessment Agency (CEAA).

The environmental clearance does not require a formal approval in the Provincial/Municipal context (i.e. it is a self-assessment exercise), whereas, formal approvals will be required under the Federal process. In fact, the review and acceptance of the design drawings

and contract documents at the design stage of the project will be required before CEAA approval is given to the project.

A simplified generalized EA process is illustrated in **Figure 6**.

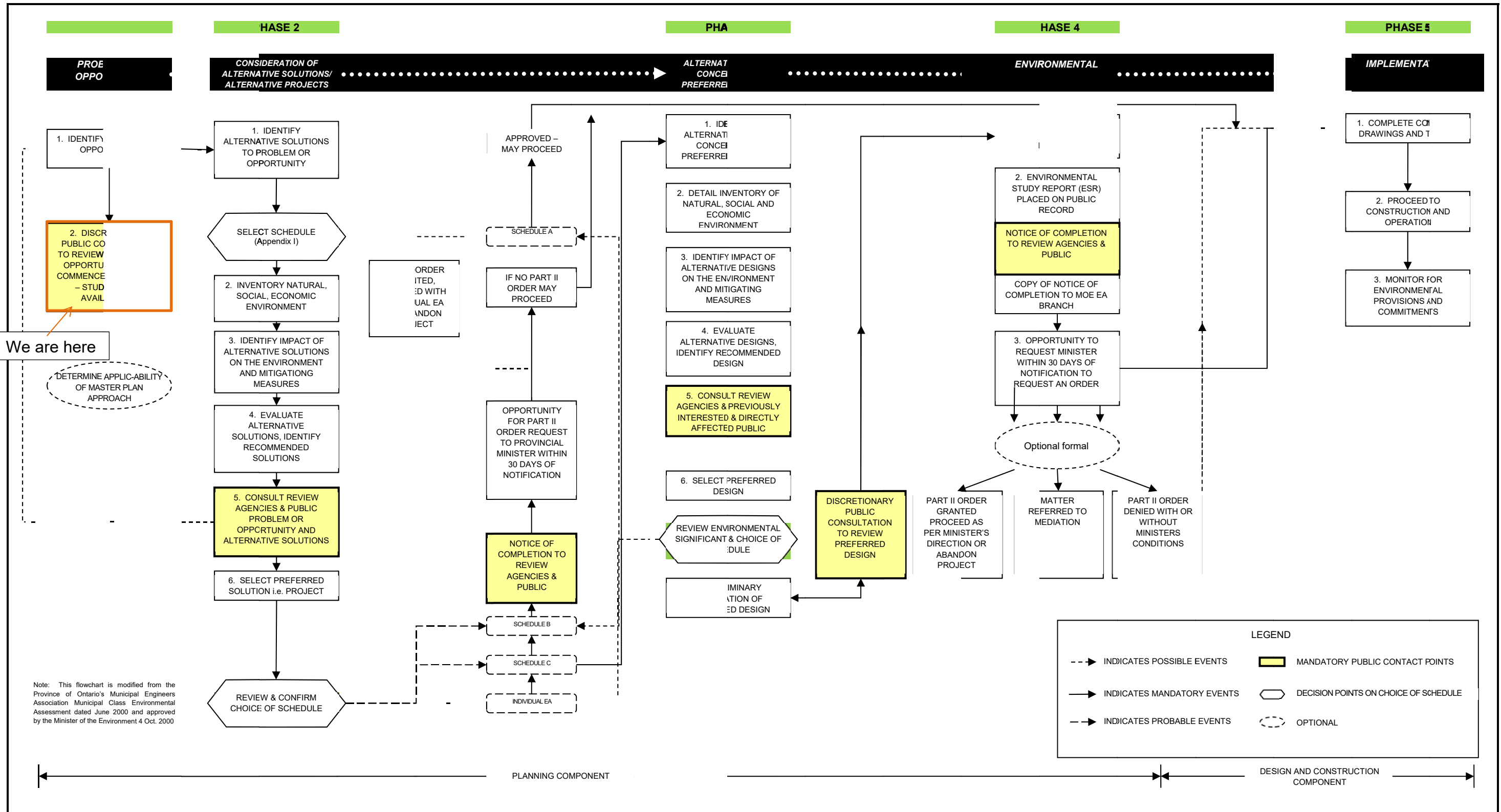


Figure 5: Municipal Class EA Process



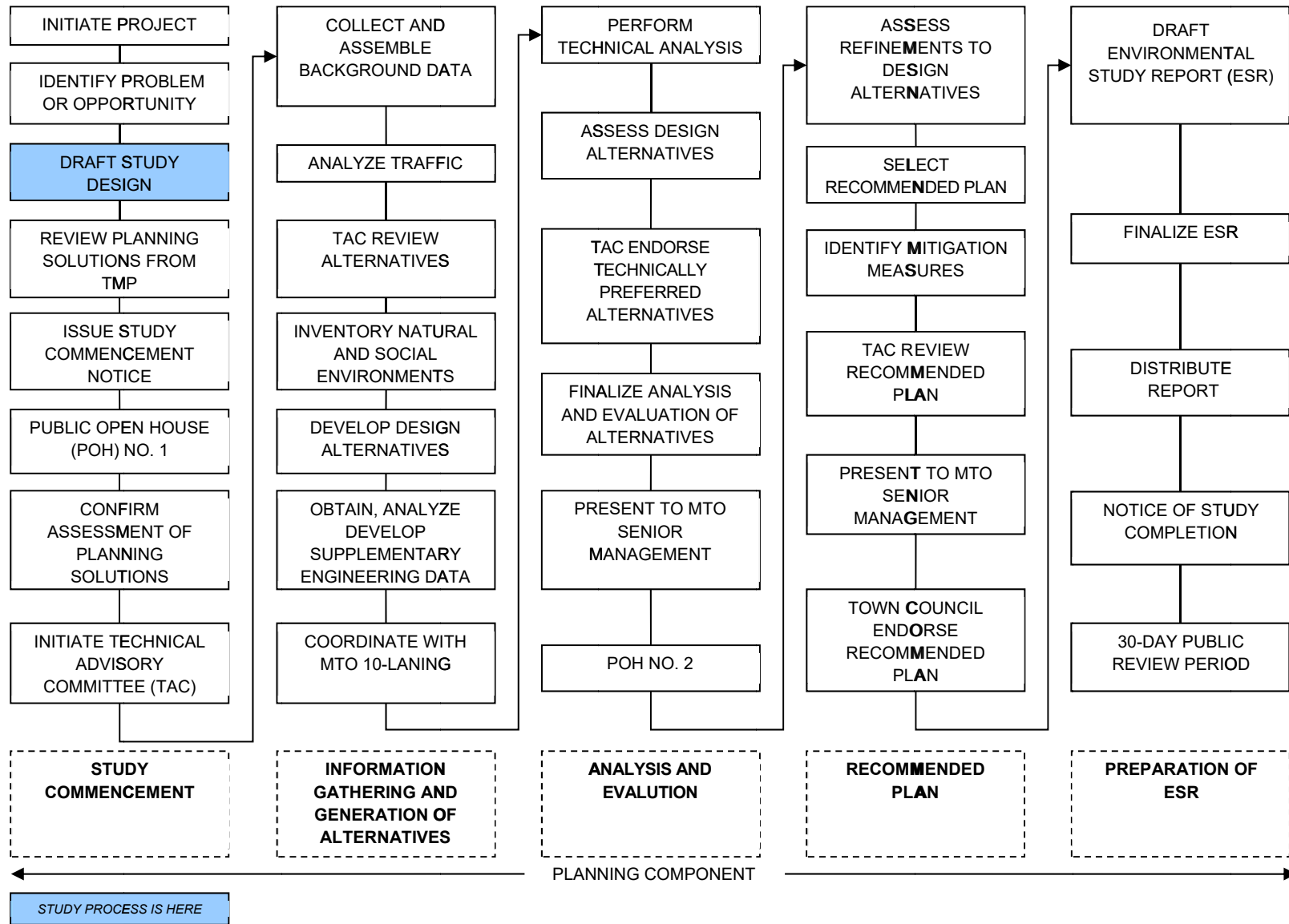


Figure 6: Simplified Generalized EA Process

### 3.0 Study Process

#### 3.1 Public Consultation Process

The public consultation approach reflects the identified study issues. Several techniques will be used to proactively involve the public including Public Open Houses (POH's) and meetings with a Technical Advisory Committee (TAC) of external agencies that may include: Town of Innisfil; Ministry of Transportation of Ontario (MTO); MTO; Ministry of Natural Resources and Forestry (MNR); Emergency Services; Lake Simcoe Region Conservation Authority (LSRCA); and Nottawasaga Valley Conservation Authority (NVCA).

The TAC will act as the decision-making group making all technical decisions and completing the analysis and evaluation exercise. Other key interest groups and utility companies will be contacted and consulted.

The use of separate meetings with external agencies and interest groups will ensure the highest level of communication with the community on issues and alternatives.

With respect to public involvement, the work program proposes the following key elements:

- Study Commencement Notice and POH notices in local papers and mailed to agencies, First Nations and Utilities.
- Posting a draft Study Design online on the Town's website.
- Maintaining and updating a study mailing list.

- POH No. 1 will present the project goals, problem and opportunity statement, draft Study Design Report (Work Plan), assessment of Alternative Planning Solutions, environmental inventories, traffic analysis, assessment of Alternative Planning Solutions, design criteria for roads and structure under study, preliminary coarse screening of Design Alternatives (interchange types, cross section and structure types) and seek public/agency input. A session will be scheduled to present information to agencies and elected officials in advance of the public.
- POH No. 2 will present the evaluation of preliminary design alternatives and a preferred design and seek public/agency input. A session will be scheduled to present information to agencies and elected officials in advance of the public.
- It is essential that there be involvement and interaction with the regulatory agencies and groups.

#### 3.2 First Nations Consultation

The following First Nations groups, as a minimum, will be contacted throughout the project and will be notified of the EA Commencement, the POH and Study Completion:

- Beausoliel First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Rama First Nation
- Metis of Ontario
- Coordinator for the Williams Treaties First Nation

- Ontario Native Affairs Secretariat
- Ministry of Aboriginal Affairs, Consultation Unit

### 3.3 Work Program

The major elements of our technical work program include the following:

#### Task 1: Project Start-Up

Upon initiation of the project, we will meet to review study scope, budget and schedule, establish members and meeting dates and role of the Technical Advisory Committee (TAC) and prepare all required agreements. The TAC will provide guidance into the technical elements of the study including the study issues, data collection and weighting of factors and the evaluation of alternatives (See **Task 7**).

#### Task 2: Information Gathering

The collection and organization of the data necessary for the analysis, evaluation and design activities will include:

- Assembly and review of the study materials;
- Field reviews and the collection of photographs to maintain a visual record of existing conditions;
- Collect reports and modelling data/output from the Town's TMP (2013);
- Obtain digital aerial photography and AutoCAD files from the 6<sup>th</sup> Line Environmental Assessment for improvements from County Road 27 and St. Johns Road (expected to be completed early 2016);

- Review the Official Plan, relevant Official Plan Amendments and Secondary Plans;
- Gather existing natural/social environmental inventories and stormwater reports; and
- Review of existing and projected traffic volumes as identified in any area traffic studies and the TMP.

#### Task 3: Study Design and Value Planning Workshop

The Study Design (this Scoping Document) describes, at the outset of the study, our intended approach in completing this EA assignment. It will present:

- Our consultation plan;
- Detailed project schedule; and,
- Identify the scope of the study's technical requirements (related to traffic and construction traffic management, highway engineering, drainage/stormwater management, structures, illumination, traffic signals), design standards and proposed evaluation criteria.

The Study Design document will help establish the foundation for all the remaining environmental planning and public consultation processes. This document will be posted on the Town website following acceptance by MTO and the Town and sent to external agencies for public review and comment. The Study Design allows the early identification of the major issues and concerns, and in addition,

recognizes areas of consensus or agreement. It defines the Problem Statement.

#### **Task 4: Transportation Analysis**

The transportation analysis will build upon the previous work that has been completed. We will examine, in greater detail, the operational implications of existing and projected traffic demands and the improvement alternatives. In this regard, the transportation analysis will involve the following key tasks:

- An initial review of the previous traffic modelling activities. It will provide an independent and objective professional assessment of the need and justification, which will be documented in the Problem Statement.
- Documentation of existing profile of road users including all modes of travel (vehicular, bicycles, pedestrians and emergency services).
- Consideration of all transportation modes, including bicycles and pedestrian traffic.
- Identification of existing/future operational problems and timelines for need for additional capacity of the transportation network.
- Providing input into the performance of each alternative (traffic operation and safety).
- Provision of input on the safety for the freeway and ramp terminals to be used in the MATS evaluation (**Task 7**).

- Confirmation of the need and justification for roadway improvements and timing.

The traffic analysis will provide a documentation of the traffic Synchro modelling within the study area and measure the operational performance of intersections and roadway links. (Arcady analysis of any roundabout alternative will also be documented.) The traffic report will also provide recommendations on the timing of the improvements. This analysis will be used to identify the preliminary design level of geometric needs of the various alternatives (i.e. storage lengths, auxiliary lanes, signal/traffic controls etc.) and in addition, will be used to evaluate the impacts/benefits of the various competing alternatives.

VISSIM modelling analysis will be utilized to review the potential of a 5th Line interchange location.

#### **Task 5: Inventory of Natural, Social and Cultural Environment**

##### ***Social Environment***

Areas of investigation will include existing and proposed land uses, land use policies and regulations, aesthetics, recreation facilities, and links with pedestrian and cycling facilities. This will document the community plan of the existing and future land uses and form the baseline from which alternatives will be measured. This is expected to include dialogue with major land owners in the Study Area.

### **Noise Analysis**

The acoustical assessment for this project will determine existing daytime sound level contours and future sound levels associated with the improvements for areas with existing residential (noise sensitive) land uses. STAMSON noise software will be used for the noise assessment. If the project becomes complex, STAMINA will be used. Noise mitigation will be assessed in accordance with applicable standards and bylaws and MTO Environmental Reference Manual. Any proposed noise mitigation will be consistent with the existing land uses and will define the future sound levels that might need to be mitigated by land developers for future residential and noise sensitive land uses in the study area. The need for mitigation will be based on both the total sound level and the forecast changes.

### **Natural Habitat Assessment**

The area of the 6th Line/Highway 400 new interchange is a transformed urban landscape recognised to support only a limited extent of natural habitat.

The natural environment review will investigate and categorize the natural and near-natural habitats of the study area and identify their supporting ecological functions. These investigations, aided through advance consultation with the MNRF, will be strategically focussed on specific significant features. Particular attention

will be paid to the potential occurrence of designated terrestrial Species at Risk (SAR) including meadowlarks, bobolinks and barn swallows, which are typically associated with transportation projects involving transformed landscapes. SAR Butternut trees also have potential to occur. We will identify and assess all provincially or regionally significant features known or found to be present. Multi-visit protocol investigation for Species at Risk (SAR) will not be conducted so far in advance of construction, however, since any such investigations are most reliably undertaken shortly before anticipated site disturbance.

A single summer field investigation will be sufficient to provide the necessary original ecological site information and potential SAR conditions in order to assist with the TPA selection process.

### **Fish Habitat Assessment**

Detailed fisheries investigations of the adjacent Innisfil Creek will be undertaken through the course of this project should it appear that an alternative interchange configuration may approach the watercourse. Field reviews will document site conditions for alternative roadway alignments where watercourses/fish habitat may be impacted. Given the proximity to the source, this reach of watercourse could be a cool/cold water stream with sensitive aquatic habitats.



A site reconnaissance of the entire study area in the spring of 2016 will confirm the creek's thermal status, note all aquatic habitat impact zones and observe any potential fish spawning opportunities for resident species. Later in the season if necessary, a field survey team will undertake the required investigations to record resident fish species, physical channel dimensions, bottom substrate, water quality and other characteristics should preferred alternatives potentially impact fish habitat. Roadway design alternatives will be reviewed, identified impacts assessed and mitigation measures developed to avoid any harmful alteration to any aquatic habitat features. The proper documentation of this information will be important to the Town in order to obtain any necessary agency permits or sign-off in the future.

### ***Cultural Heritage***

A desktop assessment of available historical sources, mapping and Town of Innisfil information to identify potential for significant cultural heritage resources within or adjacent to the study area will be conducted. The local heritage staff will be contacted to determine if any listed or designated properties are located within or adjacent to the study area. A report and preliminary MTCS screening checklist will be prepared, recommending whether additional study may be necessary to confirm the presence of cultural heritage resources, to assess the potential impact of any of

the selected alternatives, and to identify mitigation measures that may be required to reduce adverse impacts to any identified cultural heritage resources. The bridge at the study area is over 40 years old, and according to MTCS guidelines, will require a Cultural Heritage Evaluation Report (CHER) to determine cultural heritage value and recommend whether a Heritage Impact Assessment is required.

### ***Archaeology***

The Stage 1 archaeological assessment to be undertaken for this project will be conducted in accordance with the Ministry of Tourism, Culture and Sports Standards and Guidelines for Consultant Archaeologists (2010).

The objectives of a Stage 1 archaeological background study are to develop an inventory of archaeological resources in the proposed area; to determine the presence of any archaeological sites in the area; and, to recommend appropriate strategies for future planning consideration. This will be accomplished by conducting detailed documentary research of the land use, archaeological history, and present condition of the property. This information will be gathered by reviewing the National Archaeological Site Registration Database. The data gathered will advise the location, type, and significance of registered archaeological sites for a typical radius of one kilometre around the subject

property. Reviewing the registered archaeological site database will identify significant heritage resources on or adjacent to the study area, and will summarize the form and extent of previous cultural heritage investigations undertaken within the general project vicinity.

### ***Agriculture***

The agricultural land uses will be documented to define improvements (tile drainage) of fields and the existing use for crop production and livestock. The documentation will include the movement of machinery between farms as often farmers shuttle equipment from rental farms to home farms and movement will cross the interchange along the 6th Line. A consultation tool we have effectively used is to create an interactive exhibit for POH 1 that will build the farm activity mapping for the study area.

## **Task 6: Technical Investigations**

### ***Mapping***

Base mapping will be based on photogrammetric mapping.

### ***Structural***

Structural liaison will be required with MTO to coordinate the configurations of the new (or interim widened) overpasses with the cross section needs of future 4-lane 6th Line (if required).

The structure team will complete a visual condition survey and review recent MTO condition survey reports. The final deliverable will be a preliminary GA for the structural widening or replacement structures.

### ***Drainage and Hydrology***

The drainage and stormwater management design criteria will be confirmed with the Town. Hydrologic calculations 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 system and culvert crossing Highway 400 200m south of the 6th Line overpass structure. As the various alternatives are developed, the corresponding drainage and storm water design will be developed at a conceptual level of detail, sufficient to permit identification of constraints and prepare preliminary cost estimates.

### ***Geotechnical Investigations***

The geotechnical scope of work will consist of a desktop review of available information on the subsurface conditions in the study area. This would include a review and compilation of geological maps (including bedrock topography if available) and geotechnical investigation reports for projects completed in and near the study area. The data reviewed will be compiled into a technical memorandum and a geotechnical “planning map” will be prepared which would summarize the subsurface

condition information to assist in the evaluation of alignments.

### **Task 7: Development, Analysis and Evaluation of Alternatives**

As previously noted, the consideration of all reasonable alternatives is a guiding principle for EA studies. The planning alternatives in the TMP will be reviewed and confirm interchange configuration plans (developed using aerial photography).

Alternatives will include but not be limited to the following interchange configurations (and combinations):

- Parclo A;
- Parclo B;
- Parclo AB;
- Diamond; and,
- Diamond/Roundabouts.

Conventional intersection/ramp terminal alternatives will be considered as well as roundabouts. See **Section 7.3.2** for a description of the interchange types.

This study will include a systematic, traceable analysis and evaluation of the needs in the study area, the process used to identify alternatives and the methodology used to analyze and evaluate alternative planning solutions. Additionally, this assignment will include a comprehensive public consultation programme which will assist in the development of a recommended plan.

The identification of evaluation criteria will include potential factors such as

roadway level of service, traffic safety, property impacts, noise, natural environment and cost. 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.

### **Task 8: POH No. 1**

Public Open House (POH) No. 1 will present the Problem Statement, Draft Study Design, and our preliminary analysis of Planning Alternatives/Alternative Planning Solutions.

POH No. 1 will summarize the traffic and needs analysis, the environmental inventories, review of Alternative Planning Solutions and provide a recommended solution, an initial list of preliminary design alternatives and potential coarse screening of those planning alternatives. The public will be given the opportunity to provide input on the priorities of the applicable evaluation criteria.

### **Task 9: POH No. 2**

POH No. 2 will present the detailed computer based numerical technical evaluation of design alternatives and recommendation for a Preferred Design. This will quantify measurable differences between the options (performance and environmental effects). This evaluation

will present a sensitivity analysis of the distribution of weights by evaluators for the evaluation criteria. This will demonstrate the trade-offs involved in the Study.

Each POH will include coloured graphics and text boards to describe the process and opportunities for the public to provide comment. In addition, we will hold an initial viewing and briefing of the materials for elected officials and external agencies (afternoon) before opening the meeting to the public (evening).

#### **Task 10: Preparation of ESR**

The preparation of the draft and final report will follow the format and content for an ESR accepted by MOECC. The ESR will document the study methodology, findings, public involvement and recommendations. A draft version will be submitted to the Town, MTO and external review agencies prior to the preparation of the final document. Presentations will be made to Town Council.

#### **Task 11: Preliminary Design and Cost Estimates**

Preliminary design and cost estimates will be prepared for the preferred design. Functional drawings and final cost estimates for the Preferred Design will be prepared, including coordinated alignment, plans, profiles and cross sections.

#### **Task 12: Public Review of ESR**

The public will be notified of the availability of the ESR for a 30-day public review period. Individual letters (or emails) will be sent to persons/ organizations on the contact lists maintained throughout the course of the studies. The ESR will be made available at several convenient locations for the public review. Following the 30-day review period and provided that no bump-up requests have been received, the Town will have the authority to proceed with detail design and construction.

## 4.0 Study Schedule

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

<b>Task</b>	<b>Date</b>
Project Start-Up Meeting	February 2016
Study Design	February-April 2016
Information Gathering	February-April 2016
Traffic Analysis	March-April 2016
Environmental Inventories: Natural Environment, Archaeology, Fisheries, Land Use	March- August 2016
Technical Investigations” Drainage and Stormwater, Utilities, Surveying, Geotechnical	May-June 2016
Development, Analysis and Evaluation of Alternatives	May-August 2016
Public Open House (POH) No.1	June 7, 2016
Analysis and Evaluation of Design Alternatives	Summer 2016
Selection of Technically Preferred Alternatives	Summer 2016
Preliminary Design and Cost Estimates	Summer 2016
Public Open House (POH) No. 2	Fall 2016
Refinements to Technically Preferred Alternative (if required)	Fall 2016
Recommended Plan (including plan and profile drawings and other functional design elements)	Fall 2016
Draft Environmental Study Report	Fall 2016
Final ESR Submission	Fall 2016
Public Review Period	Winter 2016



## **5.0 Problem Statement**

As part of the TMP process, the Town has adopted a transportation vision statement which is as follows:

“Innisfil’s transportation network connects people and communities, fostering healthy living and operates efficiently across the Town as an environmentally and financially sustainable system”

Further to this vision statement, the Town’s TMP has identified an additional Highway 400 interchange as one of the Town’s long term transportation priorities to address future increased traffic demands.

## 6.0 Need and Justification

Current and expected increases in traffic in the County of Simcoe and Town of Innisfil necessitate transportation improvements to the surrounding infrastructure.

### 6.1 Town Plans

The Town of Innisfil's Official Plan, dated July 26, 2006 (updated April 8, 2011) has an update in progress which will be completed by the end of 2016. This land use plan defines developments and lands that will be allowed to be serviced to permit residential, commercial and industrial development in the Town. The Innisfil Heights expansion area, as identified in the approved Official Plan, triggers supporting servicing plans (water, sewer and transportation) to this level of land use intensification.

Servicing plans along 6th Line to Innisfil Heights are documented in the Town-Wide Water and Wastewater Servicing Master Plan (completed in 2012).

The transportation servicing has been defined in a Transportation Master Plan and the Draft Active Innisfil plan by Parks, Recreation and Culture. These documents are triggering project specific improvements in the Town. The project specific improvements have included improvements to 6th Line (defined in the 6th Line Environmental Assessment) and a new interchange on Highway 400 (subject of this EA Study).

The Alcona South Secondary Plan includes the Sleeping Lion Development (to the east of Highway 400) which is the first of the residential developments that will generate traffic destined to a new interchange on Highway 400. This new development will be an 1,800 unit subdivision.

### 6.2 MTO Projects

Section 5.3 of the TMP outline's MTO's planned Roadway improvements (before 2031) in the area, namely:

- Highway 400 widening to ultimate 10-lane cross section (5 lanes per direction)
- Highway 400 PDR update from Highway 89 to the Highway 400/11 split
- Structure replacements on Southern Ontario Highways Program (SHP)

These roadway improvement projects directly affect this Study, specifically the Highway 400 widening to ultimate 10-lane cross section. The 6th Line Interchange EA Study will consider ramp terminal connections and bridge structure types and configurations that will accommodate the future freeway widening.

### 6.3 GO Transit Plans

GO Rail service to Barrie based on the 2020 Strategic Plan will not change from today's 30 minute rail service in the peak direction and 1 hour bus service off-peak. GO has previously identified a new GO Station within Innisfil located at

Belle Aire Beach Road (5th Line west of 20th Sideroad) in Lefroy.

Metrolinx/GO Transit has not committed any funds or timeline for the station at 5th Line.

The expectation is that if Metrolinx/GO Transit builds a station it may be at the 6th Line and 20th Sideroad intersection, based on current land use planning.

This analysis is documented in **Section 8.3** of the TMP.

## 7.0 Assessment of Planning Solutions

Alternative Planning Solutions represent alternative ways or methods of addressing the problem to be solved by the project. These reflect different strategies and include the “Do Nothing” approach (maintaining the status quo). Following the assessment of Alternative Planning Solutions, those alternatives judged to address the Problem will be carried forward and will form the Recommended Planning Solution. The recommended planning solution will be deemed to address the problem statement required to plan for the safety of the travelling public, while providing the best overall balance between transportation engineering objectives, life cycle costs, and other environmental, cultural, socio-economic, and land use planning objectives.

The Town’s TMP identified the need for a new Highway 400 interchange as one of the Town’s long term transportation priorities. The alternative solutions presented for analysis in **Section 8.4.3** of the TMP (see **Reference 1**) were as follows:

- 1) Interchange at the 5th Line
- 2) Interchange at the 6th Line


























## 7.1 Regional TMP Alternative Planning Solutions/Alternatives to the Undertaking

The Alternative Planning Solutions (defined as Alternative Planning Strategies in the Innisfil TMP) represent candidate strategies for meeting the needs of the problem statement of the Town:

- 1) Alternative 1: The “Do Nothing” Alternative.
- 2) Alternative 2: Business As Usual.
- 3) Alternative 3: Balanced Approach
- 4) Alternative 4: Aggressive Approach

A summary of the evaluation is documented in **Section 7.5** of the TMP. The evaluation is shown in **Figure 7 (Table 7-2)** of the TMP). Alternatives 1 and 2 were screened out based on not meeting future traffic demands. Alternatives 3 and 4 were carried forward for further evaluation.

While the Town of Innisfil and the Simcoe County OP’s currently identifies an interchange at 5th Line on Highway 400, the Town of Innisfil TMP recognizes it may be more beneficial to the Town for the interchange to be located at 6th Line to support future growth and provide better access to Innisfil Heights and the Sleeping Lion development. The documentation of the review and validation of the previous analysis of the preferred location for the interchange is described in **Section 7.3**.

Criterion	Alternative 1: Do Nothing	Alternative 2: Business As Usual	Alternative 3: Balanced Approach	Alternative 4: Aggressive Approach
Transportation Service				
Natural Environment				
Policy Environment				
Socio-Economic Environment				
Financial Implications				
<b>Preliminary Findings:</b>	<b>Screened Out</b>	<b>Screened Out</b>	<b>Carried Forward</b>	<b>Carried Forward</b>
<b>Legend:</b>	Does Not Meet Criterion      Meets Criterion			

**Figure 7: Evaluation Summary of Alternative Planning Solutions/Alternatives to the Undertaking (Source: Innisfil 2013 TMP)**



## 7.2 Alternative Planning Solutions for Alcona Growth

In determining the preferred planning alternative for the Town (Alternative 3: Balanced Approach), Alternative Planning Solutions were further analyzed as part of this current EA study for the growth of Alcona. This further review and validation meets the requirements of the Class EA. The planning alternatives include:

- 1) Alternative 1: “Do Nothing”
- 2) Alternative 2: Restrict Development
- 3) Alternative 3: Transportation Demand Management (TDM)
- 4) Alternative 4: Transportation System Management (TSM)
- 5) Alternative 5: New Infrastructure (Interchange on Highway 400)

**The “Do Nothing” Alternative** – as mandated by the Class EA, must be considered. It represents a baseline from which other approaches can be compared.

**Restrict Development** – this strategy would be an approach that would limit any new residential development and therefore eliminate the need for a new interchange.

**Transportation Demand Management (TDM)** – This strategy would reduce vehicular demand and would encourage more active modes of transportation (cycling and walking).

**Transportation System Management (TSM)** – This strategy would consider

operational improvements to existing infrastructure to improve the performance of traffic operations. System improvements may include signal timing improvements, signal coordination or introduction of improvements such as turn lanes.

**New Infrastructure** – This strategy would be to provide roadway improvements and a new interchange to accommodate future demand.

### Coarse Screening of Planning Solutions

Based on planned developments in the area (Sleeping Lion and Innisfil Heights) and projected increase in traffic, the “Do Nothing” alternative and Restricting Development are not recommended to be carried forward.

The TDM and TSM are not carried forward as standalone solutions, but rather will be incorporated with the New Infrastructure alternative as a Recommended Solution. This recommendation is consistent with the findings of the 2013 TMP and will be presented to the public at POH No. 1. Should no objection to this recommendation be received by the public, then it will be accepted and the study will continue forward to assess preliminary design alternatives.

### **7.3 Preliminary Design Alternatives (Alternative Methods of Carrying Out the Undertaking)**

Preliminary design alternatives are site specific design solutions to implement the recommended planning solution. The following sections describe the consideration of interchange alternatives in two steps. The initial step (also described in the Town of Innisfil TMP) is an assessment of interchange locations and this is followed by a detailed assessment of preliminary design alternatives for the preferred interchange location. The assessment of interchange locations will be presented at POH No. 1 and should no member of the public object to the study recommendations then only preliminary design alternatives at the preferred interchange location will be carried forward.

#### **7.3.1 Coarse Screening of Interchange Location Preliminary Design Alternatives**

The Town of Innisfil TMP has reviewed and evaluated three alternatives for transportation improvements (new interchange on Highway 400) – at 4th Line, 5th Line or 6th Line (Preliminary Design Alternatives/ Alternative Methods of Carrying Out the Undertaking). These alternatives are based on the evaluation of the Planning Solutions for Alcona Growth (Alternative 5 - New Infrastructure) and a comment received

on the addition of the 4th Line interchange location.

MTO typically require a minimum distance of 2-3 km between interchanges in urban areas and 10 km in rural areas. A 6th Line interchange would be approximately 2.7 km from Innisfil Beach Road and 1.7 km from the 400 southbound OnRoute service centre. A 5th Line interchange is 4.1 km from Innisfil Beach Road but conflicts with the current OnRoute service centre. A 4th Line interchange location is 5.4 km from the Innisfil Beach Road interchange and 4.2 km from Highway 89 but 1 km from the current OnRoute service centre. The interchange spacing provided with a 6th Line interchange is similar to the spacing provided between Innisfil Beach Road and the proposed interchange at McKay Road / 10th Line in the City of Barrie. Based on interchange spacing from a Regional perspective an interchange on the 6th Line would be preferred.

From a local transportation perspective, the introduction of an interchange on the 4th or 5th Line will be farther from the development areas and have greater travel distances to reach the freeway network. An interchange on the 5th Line would create localized congestion on 20th Sideroad between 6th Line and 5th Line. Yonge Street will be approaching capacity between 7th Line and 4th Line. The 6th Line interchange location would alleviate the capacity issues on 20th Sideroad and Yonge Street. From a

local transportation network perspective, an interchange on the 6th Line would be preferred.

The 6th Line interchange may have a greater environmental impact than 5th Line with respect to the Natural Heritage System (NHS). The environmental effects and possible mitigation should be measured as part of further detailed investigations. The 5th Line interchange has impacts to the built environment (OnRoute service centre).

Beyond 2031, an interchange at 4th or 6th Line would provide greater flexibility

with respect to the provision of another new Highway 400 interchange within Innisfil, north of Highway 89. An interchange could be provided at 4th Line or 3rd Line if the 6th Line interchange is preferred and a future interchange at 6th line could be provided if an interchange at 4th Line is preferred while a 5th Line interchange would limit future interchange locations to 3rd Line.

**Table 2** illustrates the interchange location evaluation summary. The 6th Line interchange location is recommended.

<b>Table 2: 5th Line versus 6th Line Interchange Evaluation Summary</b>			
<b>Criteria</b>	<b>4th Line Interchange</b>	<b>5th Line Interchange</b>	<b>6th Line Interchange</b>
Flexibility for Future Interchange Spacing	✓	x	✓
Address Capacity issues Innisfil Beach Rd	x	x	✓
Network-Wide Traffic Benefits	-	-	✓
Supports Future Growth Areas	x	-	✓
Environmental Impacts	-	-	-
Constructability and Cost	-	-	-
Current Population	-	-	✓
Future Population	-	-	✓
Interchange Spacing	-	✓	-
Distance from Travel Centre	x	x	-
Recommendation	x	x	✓

<b>Legend:</b>	Good ✓	Fair -	Poor x
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### **7.3.2 Interchange Preliminary Design Alternatives**

effect to the Highway 400 pavement elevation at the interchange location.

#### **Interchange Alternatives**

Interchange preliminary design alternatives for the interchange will include but not be limited to the following configurations (and combinations):

- Parclo A;
- Parclo B;
- Parclo AB;
- Diamond; and,
- Diamond/Roundabouts.

See **Figure 8** for the illustration of the alternative interchange types.

#### **Structural Alternatives**

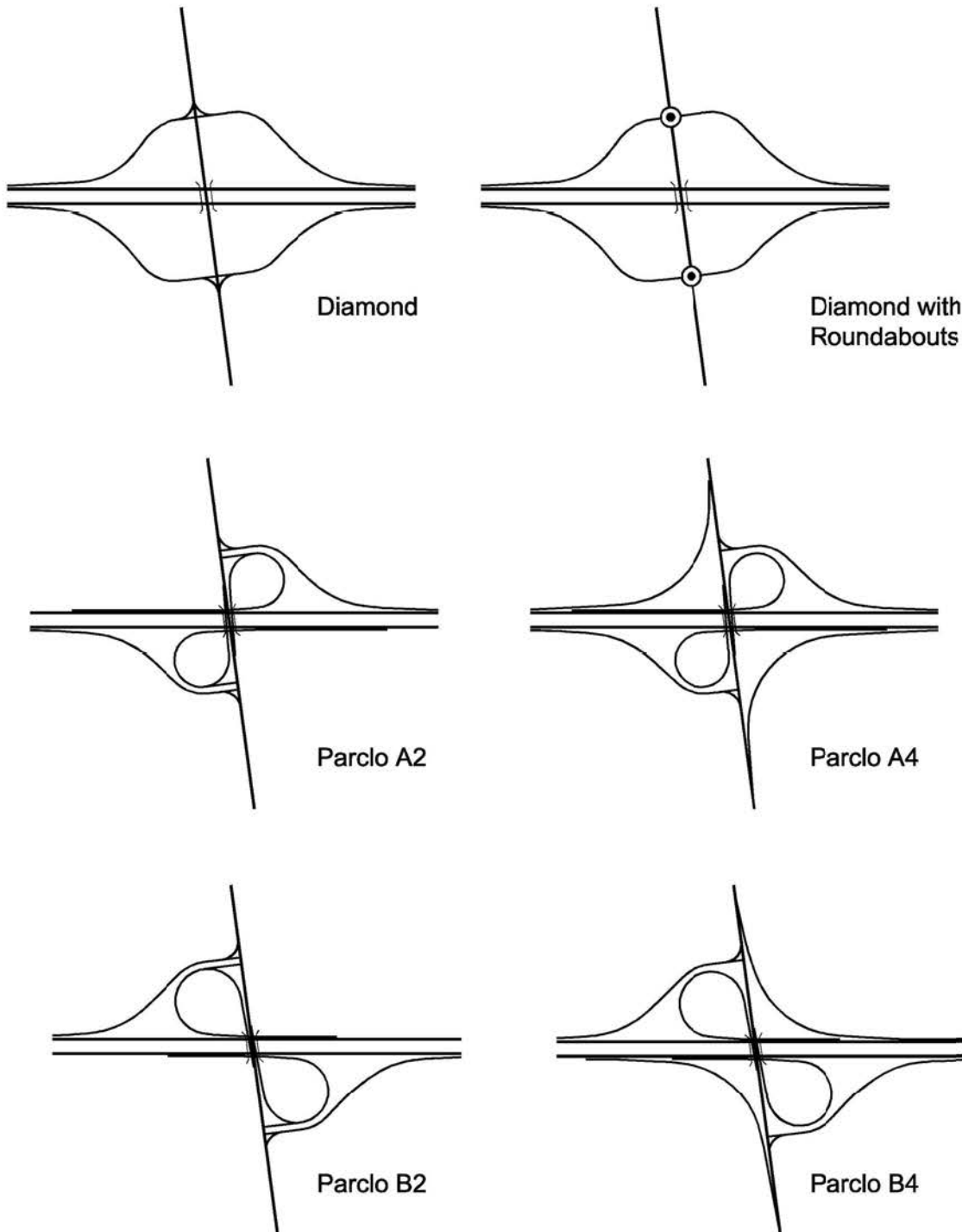
Structural alternatives for the Highway 400 bridge spanning the 6th Line will include but not be limited to the following structure types:

- Rigid frame
- Concrete deck on prestressed concrete girders
- Concrete deck on steel girders
- Post-tensioned concrete deck

Structural arrangements for the Highway 400 bridge spanning the 6th Line will consider the following:

- Single span
- Two span
- Three span

The structural review of the bridge will consider superstructure depth and the



**Figure 8: Alternative Interchange Types**

## **8.0 Recommended Solution**

Based on the analysis presented in the TMP, the Town's preference is for an interchange at 6<sup>th</sup> Line by 2031.

The analysis completed and outlined in the TMP satisfies Phases 1 and 2 of this Class EA process. As such, an interchange at Highway 400 and the 6<sup>th</sup> Line will be carried forward to this Class EA as the preferred solution.



## 9.0 Preliminary Design Considerations

Key design considerations will include:

- Liaise with MTO to coordinate the number of spans and bridge types for the new overpasses with the future Highway 400 cross section and future 4-lane 6th Line
- Development of a staging plan for the implementation of the interchange to accommodate future 6th Line cross section (2-lane arterial with speed change lanes and/or future 4-lane arterial)
- Accommodate ultimate widening of Highway 400 to a 10-lane freeway
- Access management and the potential for the removal of driveways within the influence of the interchange ramp terminals
- Crest curves on 6th Line that have poor stopping sight distances at ramp terminals (**Photo 1**)



**Photo 1: Vertical Curves on 6<sup>th</sup> Line**

- The existing overpass structure has a substandard 4.3 m clearance and Highway 400 may be required to be raised to accommodate drainage.
- The existing overpass structure on 6<sup>th</sup> Line will require additional span to accommodate active modes of

transportation (pedestrians and cyclists on 6th Line, **Photo 2**)



**Photo 2: Current Overpass Structure**

- ONroute Service Centre on Highway 400 at 5th Line and consideration of freeway widening
- Traffic to the east on 6th Line from development of approximately 1,800 homes
- Accommodating movement of farm equipment
- Impacts to active farms and farmland surrounding interchange area
- Innisfil Creek, a tributary of the Nottawasaga River
- Potential impacts to fish habitat
- Water quality and quality of increased stormwater
- Potential to integrate with overall stormwater management plan
- Accommodating expansion areas of development plan

## **10.0 List of References**

Reference 1: Transportation Master  
Plan (Town of Innisfil)

Reference 2: Official Plan (Town of  
Innisfil)

## Appendix A: Glossary of Terms

• <b>AADT</b>	Annual Average Daily Traffic – the average 24-hour, two-way traffic per day for the period from January 1st to December 31st.
• <b>Advisory Committee</b>	The Advisory Committee will include the Town and Consultant. It will act as the decision-making body for the study recommendations.
• <b>Alignment</b>	The vertical and horizontal position of a road.
• <b>Alternative</b>	Well-defined and distinct course of action that fulfils a given set of requirements. The EA Act distinguishes between alternatives to the undertaking and alternative methods of carrying out the undertaking.
• <b>Alternative Planning Solutions</b>	Alternative ways of solving problems or meeting demand (Alternatives to the Undertaking).
• <b>Alternative Design Concepts</b>	Alternative ways of solving a documented transportation deficiency or taking advantage of an opportunity. (Alternative methods of carrying out the undertaking).
• <b>Alternative Project</b>	Alternative Planning Solution, see above.
• <b>ANSI</b>	Area of Natural or Scientific Interest
• <b>Berm</b>	Earth landform used to screen areas.
• <b>BMP</b>	Best management practice.
• <b>Bump-Up</b>	The act of requesting that an environmental assessment initiated as a class EA be required to follow the individual EA process. The change is a result of a decision by the proponent or by the Minister of Environment to require that an individual environmental assessment be conducted.
• <b>Bypass</b>	A form of realignment in which the route is intended to go around a particular feature or collection of features.
• <b>Canadian Environmental Assessment Act (CEAA)</b>	The CEAA applies to projects for which the federal government holds decision-making authority. It is legislation that identifies the responsibilities and procedures for the environmental assessment.

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<ul style="list-style-type: none"><li>• <b>Class Environmental Assessment Document</b></li></ul>	An individual environmental report documenting a planning process which is formally submitted under the EA Act. Once the Class EA document is approved, projects covered by the class can be implemented without having to seek further approvals under the EA Act provided the Class EA process is followed.
<ul style="list-style-type: none"><li>• <b>Class Environmental Assessment Process</b></li></ul>	A planning process established for a group of projects in order to ensure compliance with the Environmental Assessment (EA) Act. The EA Act, in Section 13 makes provision for the establishment of Class Environmental Assessments.
<ul style="list-style-type: none"><li>• <b>Compensation</b></li></ul>	The replacement of natural habitat lost through implementation of a project, where implementation techniques and other measures could not alleviate the effects.
<ul style="list-style-type: none"><li>• <b>Consortium</b></li></ul>	A group of businesses or organizations allied to take on a project.
<ul style="list-style-type: none"><li>• <b>Corridor</b></li></ul>	A band of variable width between two locations. In transportation studies a corridor is a defined area where a new or improved transportation facility might be located.
<ul style="list-style-type: none"><li>• <b>Criterion</b></li></ul>	Explicit feature or consideration used for comparison of alternatives.
<ul style="list-style-type: none"><li>• <b>Cumulative Effects Assessment</b></li></ul>	Cumulative Effects Assessment assesses the interaction and combination of the residual environmental effects of the project during its construction and operational phases on measures to prevent or lessen the predicted impacts with the same environmental effects from other past, present, and reasonably foreseeable future projects and activities.
<ul style="list-style-type: none"><li>• <b>Decibel (dB)</b></li></ul>	A logarithmic unit of measure used for expressing level of sound.
<ul style="list-style-type: none"><li>• <b>dB(A)</b></li></ul>	'A' weighted sound level; the human ear cannot hear the very high and the very low sound frequencies as well as the mid-frequencies of sound, and hence the predicted sound levels, measured in dB(A), are a reasonable accurate approximation of sound levels heard by the human ear.

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<ul style="list-style-type: none"> <li>• <b>Detail Design</b></li> </ul>	<p>The final stage in the design process in which the engineering and environmental components of preliminary design are refined and details concerning, for example, property, drainage, utility relocations and quantity estimate requirements are prepared, and contract documents and drawings are produced.</p>
<ul style="list-style-type: none"> <li>• <b>DFO</b></li> </ul>	<p>Department of Fisheries and Oceans.</p>
<ul style="list-style-type: none"> <li>• <b>EA</b></li> </ul>	<p>Environmental Assessment</p>
<ul style="list-style-type: none"> <li>• <b>EA Act</b></li> </ul>	<p>Ontario Environmental Assessment Act (as amended by S.O. 1996 C.27), RSO 1980.</p>
<ul style="list-style-type: none"> <li>• <b>Environment</b></li> </ul>	<ul style="list-style-type: none"> <li>• Air, land or water,</li> <li>• Plant and animal life, including human life,</li> <li>• The social, economic and cultural conditions that influence the life of humans or a community,</li> <li>• Any building structure, machine or other device or thing made by humans,</li> <li>• Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or</li> <li>• Any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Environmental Effect</b></li> </ul>	<p>A change in the existing conditions of the environment which may have either beneficial (positive) or detrimental (negative) effects.</p>
<ul style="list-style-type: none"> <li>• <b>Environmentally Sensitive Areas (ESA's)</b></li> </ul>	<p>Those areas identified by any agency or level of government which contain natural features, ecological functions or cultural, historical or visual amenities which are susceptible to disturbance from human activities and which warrant protection.</p>
<ul style="list-style-type: none"> <li>• <b>Equivalent Sound Level (Leq)</b></li> </ul>	<p>The level of a continuous sound having the same energy as a fluctuating sound in a given time period. In this report Leq refers to 24-hour, 16 or 18-hour averages.</p>
<ul style="list-style-type: none"> <li>• <b>ESR</b></li> </ul>	<p>Environmental Study Report. The final document ation for Schedule C project, defining the project, consultation process, preferred solution and mitigation measures.</p>
<ul style="list-style-type: none"> <li>• <b>Evaluation</b></li> </ul>	<p>The outcome of a process that appraises the advantages and disadvantages of alternatives.</p>

• <b>Evaluation Process</b>	The process involving the identification of criteria, rating of predicted impacts, assignment of weights to criteria, and aggregation of weights, rates and criteria to produce an ordering of alternatives.
• <b>External Agencies</b>	Include Federal departments and agencies, Provincial ministries and agencies, conservation authorities, municipalities, Crown corporations or other agencies other than MTO.
• <b>General Arrangement</b>	Structural plan of the bridge and proposed works including elevations and cross-sectional views of the bridge.
• <b>Factor</b>	A category of sub-factors.
• <b>HADD</b>	Harmful Alternation, Disturbance or Destruction of fish habitat.
• <b>Individual Environmental Assessment</b>	An environmental Assessment requiring the submission of a document for approval by the Minister, pursuant to the EA Act and which is neither exempt from the EA Act nor covered by a Class EA approval.
• <b>LSRCA</b>	Lake Simcoe Region Conservation Authority
• <b>Mitigating Measure</b>	A measure that is incorporated into a project to reduce, eliminate or ameliorate detrimental environmental effects.
• <b>Mitigation</b>	Taking actions that either remove or alleviate to some degree the negative impacts associated with the implementation of alternatives.
• <b>MNRF</b>	Ministry of Natural Resources and Forestry.
• <b>MOECC</b>	Ministry of the Environment and Climate Change.
• <b>MTCS</b>	Ministry of Culture, Tourism and Sport.
• <b>MTO</b>	Ministry of Transportation Ontario.
• <b>Noise Attenuation</b>	A mitigation measure used to lessen the intensity of the noise level (dBA) where the noise level is increased in a noise sensitive area greater than 5 dBA 10 years after completion.
• <b>NSA</b>	Noise Sensitive Area is a noise sensitive land use, which has an outdoor living area associated with the residential unit.
• <b>NVCA</b>	Nottawasaga Valley Conservation Authority
• <b>OLA</b>	Outdoor Living Area is the part of an outdoor amenity area provided for the quiet enjoyment of the outdoor environment.
• <b>PIC</b>	Public Information Centre (see POH).



<ul style="list-style-type: none"> <li>• <b>Planning Alternatives</b></li> </ul>	<p>Planning alternatives are “alternative methods” under the EA Act. Identification of significant transportation engineering opportunities while protecting significant environmental features as much as possible.</p>
<ul style="list-style-type: none"> <li>• <b>Planning Solutions</b></li> </ul>	<p>That part of the planning and design process where alternatives to the undertaking and alternative routes are identified and assessed. Also described as “Alternative Project” under the federal EA Act.</p>
<ul style="list-style-type: none"> <li>• <b>POH</b></li> </ul>	<p>Public Open House (see PIC).</p>
<ul style="list-style-type: none"> <li>• <b>Prime Agricultural Areas</b></li> </ul>	<p>Prime agricultural areas as defined in municipal official plans and other government policy sources.</p>
<ul style="list-style-type: none"> <li>• <b>Project</b></li> </ul>	<p>A specific undertaking planned and implemented in accordance with the Class EA including all those activities necessary to solve a specific problem.</p>
<ul style="list-style-type: none"> <li>• <b>Project File</b></li> </ul>	<p>The final product of a Schedule B project. This is a completion of all data/reports produced for the project.</p>
<ul style="list-style-type: none"> <li>• <b>Proponent</b></li> </ul>	<p>A person or agency that carries or proposes to carry out an undertaking, or is the owner or person having charge, management, or control of an undertaking.</p>
<ul style="list-style-type: none"> <li>• <b>Public</b></li> </ul>	<p>Includes the general public, interest groups, associates, community groups, and individuals, including property owners.</p>
<ul style="list-style-type: none"> <li>• <b>Realignment</b></li> </ul>	<p>Replacement or upgrading of an existing roadway on a new or revised alignment.</p>
<ul style="list-style-type: none"> <li>• <b>Recommended Plan</b></li> </ul>	<p>That part of the planning and design process, during which various alternative solutions are examined and evaluated including consideration of environmental effects and mitigation; the recommended design solution is then developed in sufficient detail to ensure that the horizontal and vertical controls are physically compatible with the proposed site, that the requirements of lands and rights-of-way are satisfactorily identified, and that the basic design criteria or features to be contained in the design, have been fully recognized and documented in sufficient graphic detail to ensure their feasibility.</p>
<ul style="list-style-type: none"> <li>• <b>Route Alternatives</b></li> </ul>	<p>Location alternatives within a corridor.</p>
<ul style="list-style-type: none"> <li>• <b>SADT</b></li> </ul>	<p>Summer Average Daily Traffic – the average 24-hour, two-way traffic for the period from July 1<sup>st</sup> to August 31<sup>st</sup> including weekends.</p>
<ul style="list-style-type: none"> <li>• <b>Screening</b></li> </ul>	<p>Process of eliminating alternatives from further consideration, which do not meet minimum conditions or categorical requirements.</p>

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|-----------------------|---|
| • <b>Sub-factor</b>   | A single criterion used for the evaluation. Each sub-factor is grouped under one of the factors.                                  |
| • <b>TMP</b>          | Transportation Master Plan  |
| • <b>TESR</b>         | Transportation Environmental Study Report   |
| • <b>Traceability</b> | Characteristics of an evaluation process which enables its development and implementation to be followed with ease.               |
| • <b>Undertaking</b>  | In keeping with the definition of the Environmental Assessment Act, a project or activity subject to an Environmental Assessment. |