

Town of New Tecumseth
10th Sideroad and 6th Line Intersection Improvements
Municipal Class Environmental Assessment Schedule 'B'

JANUARY 2020

AINLEY FILE # 117085

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1. BACKGROUND

1.1 Introduction

Located in the Town of New Tecumseth, the 10th Sideroad and 6th Line intersection is a four-way intersection having a two-way stop control on 6th Line, with 10th Sideroad being the through road. 10th Sideroad currently functions as a 2-lane minor collector road with a 60km/h posted speed limit. The posted speed limit was reduced from 80 km/h as a result of a decision made by the Town in response to vehicle accident history, limited sight lines, and public concerns with the same. The segment of 10th Sideroad near the intersection has also been identified in the Town's 2018 Road Needs Study as requiring resurfacing in the 1-5 year timeframe.

The Town of New Tecumseth retained Ainley Group to conduct a Municipal Class Environmental Assessment (Class EA) to identify and evaluate alternative intersection improvements at 10th Sideroad and 6th Line with the objective of reducing the potential occurrence and severity of accidents and collisions, resulting from geometric and operational deficiencies within the study area. The project has followed the Schedule 'B' planning process as outlined in the Municipal Class Environmental Assessment (amended 2015) document.

1.2 Study Area

10th Sideroad is currently functioning as a 2-lane asphalt minor collector and has an average annual daily traffic (AADT) volume of approximately 3,500 vehicles per day. The 6th Line is currently a 2-lane asphalt minor collector road with approximately 500 vehicles per day. The Town's Official Plan ultimately identifies 10th Sideroad as an arterial road with a 30 m right-of-way, with 6th Line remaining as a minor collector (see Figure 1). The function of an arterial road is to serve the major flow of traffic between settlement areas in the Town by providing for the movement of traffic as opposed to providing access to abutting land uses. The surrounding terrain is rolling, with primarily agricultural uses and pockets of scattered residential enclaves. Localized drainage for the area exists in the form of open ditches with the intersection occupying the highest point.

Figure 1: Study Area



--- Study Area (Approximate)

1.3 Class Environmental Assessment Process

The Municipal Class Environmental Assessment document (amended 2015) as published by the Municipal Engineers Association outlines a planning process for municipalities to follow so as to complete infrastructure projects in an environmentally responsible manner and in accordance with the *Ontario Environmental Assessment Act (OEAA)*. Based on the scope of the proposed improvements, a Schedule 'B' level of planning is required. A Schedule 'B' project requires completion of Phases 1 & 2 of the Class EA process as illustrated in Figure 2, which is generally comprised of the following tasks:

Phases 1 & 2

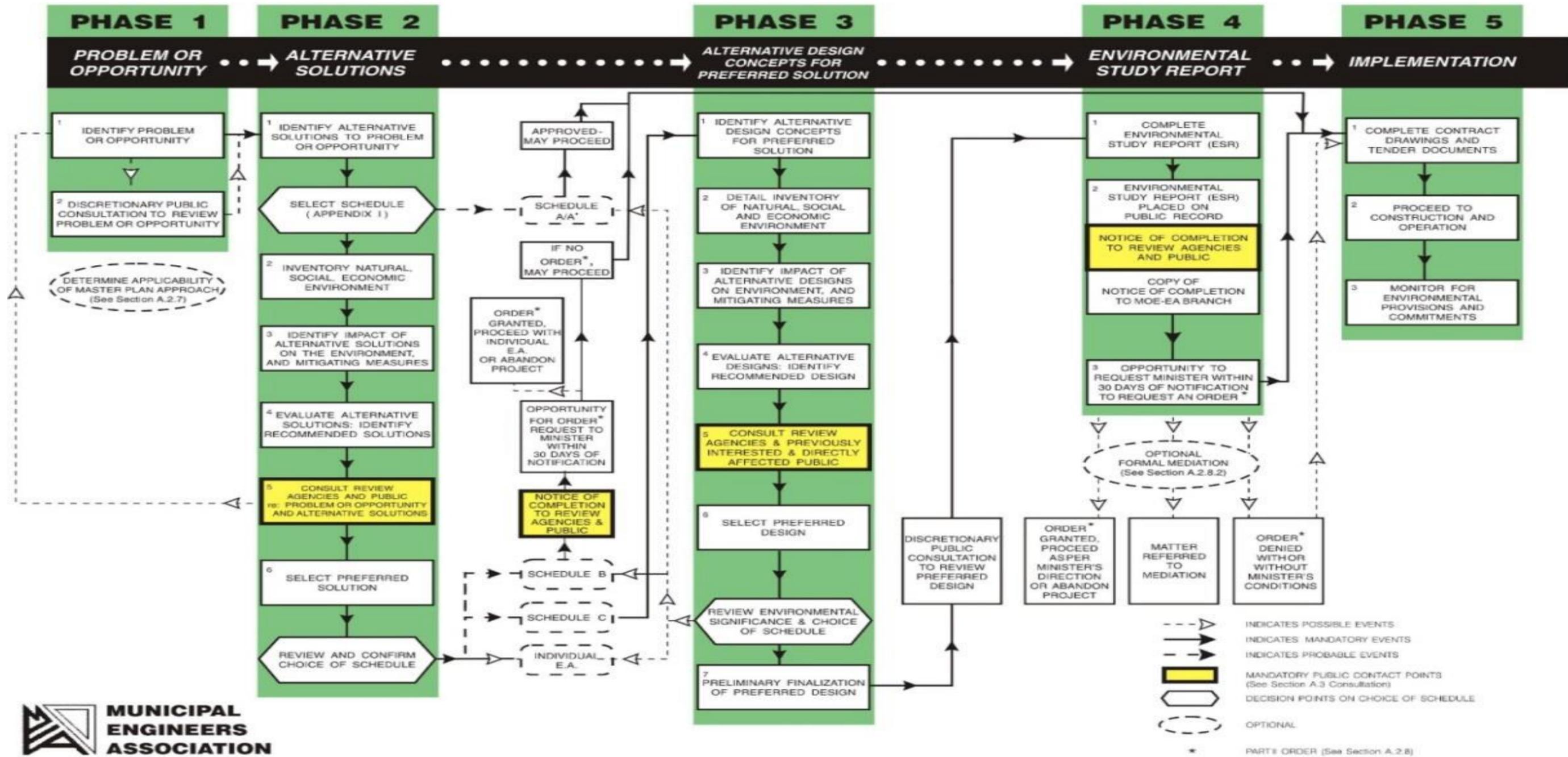
- Identify the problem/opportunity;
- Inventory the existing environment (physical, natural, social and economic);
- Develop Alternative Solutions to address the problem(s);
- Evaluate proposed alternatives;
- Schedule Public Information Centre;
- Select the Preferred Solution in consideration of comments received;
- Establish mitigation measures to minimize potential environmental effects;
- Finalize the Project File Report (PFR); and
- Issue a Notice of Completion followed by a 30-day review period.

Consultation is a key component of this process to allow members of the public, Indigenous agencies and communities and relevant review agencies opportunity to comment.

1.4 Objectives of this Report

The objective of this report is to document the Class EA, Schedule 'B', planning process completed for this project. This report identifies the deficiencies affecting the subject study area; the Problem Statement to be addressed; the alternative solutions considered; and the evaluation of these alternatives to demonstrate the decision-making process leading to the selection of the preferred solution. This report also describes the existing project environment, the potential for environmental impact, and the mitigation strategy proposed. Consultation completed during this process is also included.

Figure 2: Municipal Class Environmental Assessment Flow Chart



1.5 Project Team

The project team involved in the completion of this Schedule 'B' Class EA includes the following:

Proponent:	Town of New Tecumseth
Prime Consultant:	Ainley Group
Sub-Consultants:	Azimuth Environmental Consulting, Inc. A.M. Archaeological Associates

2. PLANNING POLICY AND THIS CLASS EA

This section provides a brief discussion of various land use planning policies and principles to illustrate the consistency of this project in relation to provincial, regional and municipal planning goals.

2.1 Provincial Policy Statement (2014)

The *Provincial Policy Statement (2014)* provides policy direction relating to land use planning and development in Ontario. Section 3 of the *Planning Act* stipulates that all decisions affecting planning matters are to be consistent with the *Provincial Policy Statement (PPS)*. Policies applicable to this project include the following:

- **Section 1.6.1** "Infrastructure, electricity generation facilities and transmission and distribution systems, and public service facilities shall be provided in coordination, efficient and cost-effective manner that considers impacts from climate change while accommodating projected needs."
- **Section 1.6.7.1** "Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address project needs."
- **Section 1.6.8.1** "Planning authorities shall plan for and protect corridors and rights-of-way for infrastructure, including transportation, transit and electricity generation facilities and transmission systems to meet current and projected needs."
- **Section 2.1.1** "Natural features and areas shall be protected for the long term."

- **Section 2.6.1** “Significant built heritage resource and significant cultural heritage landscapes shall be conserved.”

As the current project is following a Municipal Class Environmental Assessment process, consideration is being given to the potential to impact the physical, natural, social, and economic environment prior to selection of the preferred solution. Various studies have been completed to obtain a better understanding of the existing conditions of the study area so that impacts can be properly assessed and appropriate mitigation developed.

2.2 Places to Grow Act (2005)

Under the *Places to Grow Act* (2005), regional Growth Plans have been developed to manage long-term growth and infrastructure renewal throughout the province. The *Growth Plan for the Greater Golden Horseshoe* came into effect in 2006. This growth plan was replaced by *A Place to Grow – Growth Plan for the Greater Golden Horseshoe*, which came into effect on May 16, 2019 and is the document that provides direction for the Town of New Tecumseth in this regard. The Growth Plan is a long-term plan that promotes the revitalization of downtown cores and the creation of “complete communities” that have all amenities, housing & employment in one location with the goal of eliminating urban sprawl, reducing traffic congestion and protecting important features such as farmland and environmentally sensitive areas. Under the Act, municipal Official Plans are required to reflect the policies of the Growth Plan. The plan encourages an integrated transit and transportation network that allows for different options of travel that include transit, bicycle, bus etc. The Plan directs that transportation and servicing infrastructure be planned and constructed in a timely fashion to meet projected needs.

2.3 Town of New Tecumseth Official Plan

The Town of New Tecumseth Official Plan approved by the County of Simcoe in August of 2019. The Plan was developed to incorporate the policies of both the Province of Ontario and the County of Simcoe and provides a long range, comprehensive plan to guide development for the municipality until the year 2031. The document was developed with consideration given to matters of Provincial interest that included the Provincial Policy Statements, the Lake Simcoe Protection Plan, *A Place to Grow – Growth Plan for the Greater Golden Horseshoe* and was prepared in accordance with the *Greenbelt Plan (2005)*.

Policies providing guidance for transportation/servicing infrastructure, natural heritage, cultural heritage as well as general land use management are all outlined in the Town of New Tecumseth Official Plan. Since the plan has incorporated both the Growth Plan and the PPS, among others, into the Official Plan, the reasoning provided in the previous two sections that demonstrate consistency of this Class EA with those policies can also be applied to the Official Plan.

2.4 Nottawasaga Valley Conservation Authority Guidance Documents

Portions of the project study area are within an area regulated by the Nottawasaga Valley Conservation Authority (NVCA) and, as such, depending upon the scope of the preferred solution, a permit may be required from this agency prior to construction. The *NVCA Planning and Regulation Guidelines* (NVCA, August 2009) is a guidance document that outlines the role of a conservation authority in the management of stormwater under the *Conservation Authorities Act* and the *Planning Act*. These guidelines provide direction relating to standards and requirements associated with the NVCA approvals. Consideration was given to the aforementioned documents in the development of this Class EA.

2.5 Source Water Protection

The purpose of the Clean Water Act (2006) is to protect drinking water at the source and to safeguard human health and the environment. It aims to protect existing and future drinking water sources. It ensures that municipal drinking water supplies are protected through prevention by the development of a watershed-based source protection plan. The source protection plans identify vulnerable areas within each municipality and provide policies to address existing and future risks to municipal drinking water sources within these vulnerable areas. This project is subject to the South Georgian Bay Lake Simcoe Source Protection Plan (SGBLS – SPP) and is within the Nottawasaga Valley Source Protection Area.

Using the Ministry of the Environment, Conservation and Parks (MECP) Source Protection Information Atlas, a search was completed to identify any vulnerable areas present within the study area. It was determined that there are no vulnerable areas within the study area and therefore, no South Georgian Bay Lake Simcoe (SGBLS) Source Protection Plan policies apply and there will not be any source protection requirements for the proposed works. However, should there be any dewatering requirements that require a permit to take water, the MECP will have to review and approve the permit before local approvals can be issued.

2.6 Climate Change

The MECP document entitled “Considering Climate Change in the Environmental Assessment Process” (2017) provides guidance relating to the Ministry’s expectations for considering climate change during the environmental assessment process. The Guide is now a part of the Environmental Assessment Program’s Guides and Codes of Practice. The environmental assessment of proposed undertakings is to consider how a project might impact climate change and how climate change may impact a project. Climate Change was considered during the course of this Class EA and is further discussed in Section 10.0.

3. EXISTING CONDITIONS

This section describes the characteristics of the study area to provide context and allow the problem statement to be defined.

3.1 Physical Environment

The physical environment encompasses the transportation corridor, infrastructure, and utility systems within the study area.

3.1.1 Existing Roadway

10th Sideroad and 6th Line through the project limits are currently both rural, hard surfaced 2-lane roads. This segment of 10th Sideroad connects the Village of Beeton with Highway 9 to the south and 6th Line acts as a local rural residential and agricultural road without any significant through traffic use. Within the Town of New Tecumseth’s Official Plan (OP), 10th Sideroad is designated as arterial and 6th Line is designated as a Minor Collector.

Posted Speed Limit

10th Sideroad is currently posted at 60 km/h through the project limits. The posted limit increases to 80 km/h approximately 400m north of the intersection. To the south of the project limit, the posted speed remains at 60km/h to south of the 5th Line, beyond Tecumseth South Central Public School.

6th Line is unposted at the intersection; however, the eastbound approach from County Road 10 (Tottenham Road) and the westbound approach from Sideroad 15 are both posted at 80 km/h.

Horizontal Alignment

10th Sideroad follows a generally straight alignment with no noticeable curvature. No horizontal geometric deficiencies were noted.

6th Line follows a deflected curvature southerly from the original road allowance for approximately 300m on either side of 10th Sideroad. Based on legal property plan information, this is believed to have been done to improve sight line characteristics at the intersection in the late 1970's. The existing back-to-back curves appear to have a radius of approximately 100m each.

Vertical Alignment

10th Sideroad follows a hilly profile with approach grades of approximately 8% to the north and south of 6th Line. The existing vertical crest curve at the intersection has been measured to a K value of approximately 13, which results in an equivalent design speed of less than 60 km/h.

The 6th Line profile is much flatter with the existing sag curve at the intersection measuring to a K value of approximately 65, which exceeds the minimum standards. No significant vertical geometric deficiencies are noted for 6th Line through the project limits.

Cross Section

10th Sideroad consists of a two-lane rural cross section with a paved road platform of approximately 6.9m in width. Shoulders are granular surfaced and vary averaging approximately 2.0m in width, with localized firm vegetated windrowing along the rounding point.

6th Line consists of a two-lane rural cross section with a paved road platform of approximately 6.8m in width. Shoulders are granular surfaced and vary averaging approximately 2.0m in width.

No guide rail systems were found within the project limits with the exception of wooden delineator posts on the east side of 10th Sideroad, beginning approximately 100m north of 6th Line.

Streetlighting

Neither 10th Sideroad nor 6th Line are continuously illuminated. There is a single streetlight on the southeast corner of the intersection providing partial illumination.

Intersection Geometry

The existing intersection is a two-way stop-controlled intersection with free movement permitted on 10th Sideroad and stop control on 6th Line. Intersection radii vary slightly and are approximately between 12m and 15m. The intersection angle is generally 90°.

There are no defined auxiliary lanes for protected turning movements. A review of warrants for auxiliary lanes were not considered as part of the scope of this assignment.

Private Properties & Entrances

There are eighteen (18) residential properties located adjacent to the study area, with nine (9) of them having an individual residential entrance (driveway) accessing 10th Sideroad and the remaining nine (9) having an individual residential entrance accessing 6th Line. Additionally, within the study area there are two (2) individual agricultural field entrances.

3.1.2 Existing Traffic Conditions

The Average Daily Volume and Peak Hour Volume for the roadways, based on information available in the Town of New Tecumseth Road Needs Study Update dated April 2019, are shown in Table 1.

Table 1: Average Daily and Peak Hour Volumes for 10th Sideroad and 6th Line

Subject Road Section	2017 Average Daily Volume	2017 Peak Hour Volume
10 th Sideroad NB	1,858	241
10 th Sideroad SB	1,649	170
6 th Line WB	288	42
6 th Line EB	274	27

A forecasted growth of 10% in traffic volumes over 10 years has been applied for both 10th Sideroad and 6th Line in the Road Needs Study Update.

Speed data was also collected as part of the 2017 traffic counts, with the average speed noted for 10th Sideroad and 6th Line in the study area listed as 75 km/h and 67 km/h, respectively.

3.1.3 Existing Operational Concerns

Available reported accident data from 2012-2015 was summarized in Report # ENG-2016-16, prepared by the Town. Within the three-year timeframe, there were four reported accidents. Three of the four accidents involved a single motor vehicle with driver's either going too fast for the weather conditions or attempting to avoid a wild animal. One accident was reported as a multiple vehicle collision, resulting in a fatality, with speed too fast for conditions also listed as a primary cause. These collisions are summarized in Table 2.

Table 2: Collision Summary

Date	Time	Roadway	Primary Cause	Weather	Collision Type
Jan 3, 2013	20:20	SR 10	Lost control	Snow	Single Motor Vehicle
Nov 3, 2013	11:28	SR 10	Wild animal	Clear	Single Motor Vehicle

Feb 21, 2015	15:30	6 th Line	Speed too fast for conditions	Snow	Single Motor Vehicle
Oct 10, 2015	11:10	SR 10	Speed too fast for conditions	Clear	Angle - Fatal

It is understood that some of the reported concerns with the intersection relate to vehicles attempting movements from 6th Line onto 10th Sideroad without sufficient time to accelerate and through vehicles on 10th Sideroad having insufficient time to react once the vehicles entering from 6th Line come into their field of vision as they ascend the hill. This is coupled with reports of observed operating speeds on 10th Sideroad that frequently exceed the posted speed limit of 60 km/h.

3.1.4 Existing Property Fabric

Based on a review of the registry office property plan information, 10th Sideroad and 6th Line were originally depicted as having a 20.117m Right-of-Way (ROW) width (66 feet as depicted on Registry Plans), with additional property acquired circa 1976, to accommodate localized grading requirements. Maximum 10th Sideroad ROW width is approximately 55m at the old 6th Line ROW.

The deflected 6th Line alignment ROW is irregular in shape and varies in width from approximately 25m to 32m.

3.1.5 Existing Utilities

Further to locate information obtained from One-Call; Hydro One and Bell were identified, and subsequently confirmed as operating plant within the project limits. Rogers Cable had erroneously returned a positive One-Call hit, however a follow-up with Rogers staff resulted in a confirmation of no plant in the vicinity.

Hydro One

Overhead (2.4/4.16kV / 4.8/8.32kV) Primary hydro is located on the west side of 10th Sideroad. The primary lines cross diagonally to the east side of 10th Sideroad approximately 300m north of the intersection.

Overhead (2.4/4.16kV / 4.8/8.32kV) Primary hydro is also located along the north side of the old 6th Line ROW back-feeding the four properties on the north side of 6th Line at the intersection. The primary hydro rejoins the roadway where it returns to the original 6th Line ROW further on to the east and west. Primary hydro crosses 10th Sideroad aerially on two spans at the existing intersection to supply the one southeast corner property and the single street at the intersection.

Bell

Buried conduit (all copper) was identified by Bell staff along the west side of 10th Sideroad with a crossing along the north leg with the 6th Line intersection. There is a tee branching westward along the south side of 6th Line to an Outside Plant Interface (OPI) cabinet approximately 80m away from the intersection. Further buried cables were identified along the north side of 6th Line extending westward and eastward from the intersection. Depending upon the selected preferred solution, daylighting in the form of test pits may be required to accurately locate buried Bell plant during detail design and confirm the need for any relocation.

3.2 Natural Environment

This section provides an inventory of the existing natural environment, including area vegetation, wildlife, Species-at-Risk (SAR), aquatic (fish/fish habitat), significant resources, surface water and groundwater. To assist in the completion of this inventory, Azimuth Environmental Ltd., on behalf of Ainley Group, completed a Natural Heritage Evaluation (NHE). A copy of the full report is included in **Appendix 'A'**.

3.2.1 Terrestrial Habitat

As illustrated in Figure #8 of Azimuth's report, adjacent lands contain a mix of farmland, woodlands/pine plantations interspersed with numerous rural residences. The Right-of-Way (ROW) traverses predominantly open lands and contains a scattering of roadside trees and shrubs. The topography is variable and "rolling". The ROW contains power lines and is subject to periodic maintenance/vegetation control.

3.2.2 Vegetation

All of the vegetation communities are types common locally and are typical of species associated with ruderal habitats. None are types considered provincially rare. Two Butternut Trees (Endangered) were observed at the edge of the ROW on the west side of 10th Sideroad in proximity to the southern project limits.

3.2.3 Fish and Fish Habitat

A drainage feature mapped on NVCA regulated lands mapping is located approximately 0.5 km north of 10th Sideroad and 6th line intersection. The feature and the associated culvert were dry when observed on May 15, 2019 indicating limited flow conveyance despite an unseasonably wet spring. A defined channel was noted extending from the ROW to the northeast, east of 10th

Sideroad. The channel is expected to carry surface flows beyond the ROW northeasterly, and based on mapping, is anticipated to discharge to Innisfil Creek. The drainage feature within the ROW does exhibit characteristics of direct fish habitat, and is anticipated to transition to fish habitat within adjacent Environmental Protection Zone 1 lands (beyond the ROW) as shown on Town of New Tecumseth OP Schedule C1. Additional field study would be required in order to confirm hydraulic functions and fish habitat potential at this crossing. If hydraulic connectivity occurs with downstream receiving systems, and the crossing sustains seasonal flow on an annual basis, there is potential for this drainage feature to be considered seasonal indirect fish habitat.

A second drainage feature is also mapped on NVCA regulated lands mapping, located approximately 0.5 km south of 10th Sideroad and 6th Line intersection. Flow gradient is from east to west, and is mapped by the NVCA as a headwater tributary of Beeton Creek. No water was present, and there was no connecting surface drainage channel extending from the ROW. At the ROW the feature does not have characteristics of fish habitat and appears to have no hydraulic connectivity to nearby watercourses. Therefore, this feature is not assessed as fish habitat and there are no features defining a Valley and Stream Corridor in the area in contrast to OP Schedule C2.

3.2.4 Wildlife and Species at Risk

The following species were observed and/or documented to occur on site during the field survey:

- Mammals - Red Squirrel, Eastern Chipmunk, White-tailed Deer, Eastern Cottontail
- Birds - Black-capped Chickadee, Blue Jay, Downy Woodpecker, and White Breasted Nuthatch

None of these are a Species at Risk or species considered provincially rare and all are common locally. As there are no wetlands located within or in proximity to the project limits, there is no habitat for amphibians or turtles potentially impacted by the proposed road works.

A SAR assessment was completed based on background data reporting of SAR information from multiple sources as per current agency direction. The results of SAR screening revealed the potential for occurrence of the following Endangered (END) and Threatened (THR) species (individuals and habitat protected under *Ontario's Endangered Species Act*) in the vicinity of the proposed road works:

- Birds - Bank Swallow (THR), Barn Swallow (THR), Bobolink (THR), and Eastern Meadowlark (THR)
- Plants - Butternut (END)

- Mammals – Tri-colored Bat (END), Northern Myotis Bat (END), and Little Brown Myotis Bat (END)

The following Special Concern (SC) species (individuals and habitat not protected under Ontario's Endangered Species Act) have been reported locally:

- Birds - Eastern wood-pewee, Grasshopper Sparrow, Red-headed Woodpecker, and Wood Thrush
- Reptiles – Snapping Turtle
- Insects – Monarch Butterfly

3.2.5 Significant Resources

There are no Provincially Significant Wetlands (PSWs) or Areas of Natural or Scientific Interest (ANSIs), within or in vicinity to the study area. Ministry of Natural Resources and Forestry (MNR) Unevaluated Wetlands are identified on adjacent lands to the south of the 6th Line, over 200m from the project limits.

The Criterion Schedule for Ecoregion 6E (MNR 2015) identifies over 35 wildlife habitat functions to scrutinize for significance. Based on site-specific and background data, the natural heritage features located adjacent to the ROW may function as the following Significant Habitats:

- Woodland Area-Sensitive Bird Breeding Habitat
- Bat Maternity Colony Habitat
- Habitat of Special Concern and Rare Wildlife Species

3.2.6 Surface Water Conveyance

Existing drainage on 10th Sideroad and 6th Line is that of a rural cross section with open ditch intermediate flow conveyance to two crossings: one to the north and one to the south of the intersection as described in Section 3.2.3.

3.2.7 Groundwater and Source Water Protection

As indicated, the project study area has been identified by the Ministry of the Environment, Conservation and Parks (MECP) as not being located within any vulnerable areas and therefore, there will not be any source protection requirements for the proposed works.

3.3 Social Environment

3.3.1 Land Use

According to the Official Plan, the predominant land use through the project limits is Rural.

3.3.2 Noise

Situated within a rural area, the study area is located immediately adjacent to approximately eighteen (18) residential dwellings, each having the potential to be sensitive to noise impacts. There are no other major noise sensitive receptors within close proximity to the study area.

3.3.3 Archaeological Resources

A Stage 1 Archaeological Assessment was completed for this Class EA by A.M. Archaeological Associates in April 2019. The Stage 1 Report concluded that the existing roadway and ditches around the 10th Sideroad and 6th Line intersection have been extensively and intensively disturbed and no longer have archaeological potential. As a result, no further investigation is required in these areas. Most of the lands outside of the existing roadway and ditches around the 10th Sideroad and 6th Line intersection have archaeological potential. Any proposed impacts to these areas should be preceded by a Stage 2 assessment in accordance with *Section 2.1.1 Pedestrian Survey* or *Section 2.1.2 Test Pit Survey* as described in the *Standards and Guidelines for Consultant Archaeologists*, 2011. A copy of the full Stage 1 report is included in **Appendix 'B'**.

3.3.4 Cultural Heritage Resources

To determine the presence of cultural heritage resources within the Study Area, the Town's Heritage Register of Designated Properties was consulted and the MTCS Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes Checklist was completed (see **Appendix 'B1'**) with no cultural heritage potential identified.

4. PHASE 1 – PROBLEM/OPPORTUNITY STATEMENT

The purpose of Phase 1 of the Class EA process is the development of a problem/opportunity statement that clearly identifies the issue, challenge, or opportunity that is being reviewed and addressed. The problem/opportunity statement that has been developed for the 10th Sideroad and 6th Line intersection is summarized as follows:

“Identify appropriate roadway and intersection improvements, which will reduce the potential occurrence and severity of accidents and collisions, resulting from any geometric and operational deficiencies within the study area.”

5. PHASE 2 – PROPOSED ALTERNATIVE SOLUTIONS

As part of Phase 2 of the Class EA process, several alternative solutions to address the aforementioned deficiencies have been developed and are presented in the subsections that follow. The following standards and guidelines have been referenced in developing the various alternatives:

- Town of New Tecumseth Engineering Design Criteria for Subdivisions and Capital Works Projects
- TAC, Geometric Design Guide for Canadian Roads, June 2017
- MTO, Design Supplement for TAC Geometric Design Guide for Canadian Roads, June 2017
- MTO, Roadside Design Manual, 2017
- MEA, Municipal Class Environmental Assessment Document, October 2000 (2007, 2011, 2015)
- Ontario Provincial Standards for Roads and Public Works (OPS)
- Ontario Traffic Manuals

5.1 Preliminary Screening

In developing alternatives and in an effort to limit the number of alternatives put forward for further consideration, a number of alternatives were not advanced through to the final evaluation matrix. They have been included below to illustrate the various additional avenues explored and the rationale for their elimination from further evaluation:

- 4-Way Stop - The volume of traffic along 10th Sideroad is much higher than 6th Line. This type of traffic control would unnecessarily encumber and prohibit the desired free flow of traffic along 10th Sideroad in contradiction to its classification and could potentially result in traffic disregarding the stop signs. In addition, the existing volumes present at the intersection and the accident history do not meet the criteria, nor satisfy the warrants for the implementation of a 4-way stop. Starting and stopping of traffic when unnecessary can also result in more impacts to noise and air quality, affecting the area residents.

- Channelization - This scenario would provide a separate acceleration/merge lane for vehicles making a right turn movement from 6th Line onto 10th Sideroad. While this may address part of the problem, it would not provide any benefit to vehicles making a left turn movement from 6th Line onto 10th Sideroad or from 10th Sideroad to 6th Line.
- Intersection Relocation – This alternative would explore the relocation of the intersection to the original ROW or alternative alignment. The disadvantages of this scenario include the significant construction costs, property impacts, and impacts to the natural environment.

5.2 Alternative A – “Do Nothing”

The “Do-Nothing” alternative considers retaining/maintaining the existing roadway ‘as is’ with no improvements and/or modifications to the existing cross-section. This alternative provides a benchmark to gauge the potential for impacts of the other alternatives.

5.3 Alternative B – Geometric Improvements

This alternative represents the geometric improvement (i.e. cut) to the vertical alignment along the 10th Sideroad that would be required to meet current standards, including sightline requirements, for a crest curve with a posted speed of 80 km/h in order to fit its function as an arterial roadway as designated by the Town’s Official Plan. The vertical alignment along 6th Line would be adjusted to match at the current intersection location.

5.4 Alternative C – Operational and Geometric Improvements

This alternative represents the maximum geometric improvement (i.e. cut) to the vertical alignment along the 10th Sideroad that could be implemented at the existing intersection with 6th Line while limiting the impacts to the immediately adjacent properties, including the ability to regrade adjacent driveways along 6th Line and the ability to accommodate the grade corrections while limiting property impacts and acquisitions.

The resulting design speed would be a function of the aforementioned constraints and the posted speed would be set accordingly.

5.5 Alternative D – Signalization

This alternative represents an option to improve safety at the intersection through signalization. The system would be set such that 10th Sideroad would rest on green until a vehicle on the 6th

Line actuates a call for green on the side road. Appropriate advanced warning elements would be placed in advance of the intersection to warn through traffic on 10th Sideroad to “prepare to stop” if a call from the 6th Line occurs. Under this alternative, the existing 60km/hr posted speed would remain unchanged.

Figures illustrating the various alternatives can be found in *Appendix ‘C’*.

6. EVALUATION OF POTENTIAL IMPACTS AND ALTERNATIVE SOLUTIONS

This section provides a discussion on the potential impacts each of the identified alternatives may have on the existing physical, natural, social and economic environment. It also identifies the evaluation criteria used to assess the alternative solutions and summarizes the results of the evaluation.

6.1 Potential Impacts

6.1.1 Physical Environment

The alternatives selected as a part of this assessment have been developed to address and/or improve the existing deficiencies impacting the project study area while posing the lowest potential to negatively impact the existing physical environment. While the ‘Do Nothing’ alternative will produce the least amount of impact on the physical environment it does not address the existing condition of the 10th Sideroad and 6th Line intersection.

Given that the existing roadway has been cut into the existing topography the effects of vertical profile corrections would require substantial earthworks and/or slope treatments (i.e. retaining walls) to facilitate the improvements. The remaining alternatives would represent increasing potential for impact as the varying footprints of disturbances would influence the potential for utility relocations, property acquisitions, grading and subsequent impacts on private property. These impacts to the physical environment combined with the increased associated construction costs may have a significant impact on the final alternative chosen for improvements.

6.1.2 Natural Environment

The proposed road works pose limited and manageable risk to significant natural heritage features and functions including fish habitat and SAR. As the proposed road works are generally confined to the ROW and involve existing travelled roadways there is no expectation of indirect

impact to Significant Wildlife Habitat functions as wildlife of the area are subject to the sights and sounds of human activity associated with vehicle traffic, residential land use and farm operations.

Tree and shrub cover within the ROW is not functionally part of the Significant Woodlands mapped adjacent to portions of the ROW located north of the 6th Line intersection. Therefore, any required tree clearing does not impact the integrity of significant woodlands. The Butternuts observed occur within 50m of proposed road works and a Butternut Health Assessment (BHA) should be completed to establish “retention status” as defined under Ontario’s ESA. If the BHA establishes one or both of the trees to be either Category 2 (retainable) or 3 (achievable), next steps will have to be established based on retention status and potential for impact. This may require consultation with the MECP and may involve securing of permitting issued under Ontario’s ESA for removal and/or works in proximity.

The drainage feature north of the 6th Line and 10th Sideroad intersection has the potential to function as indirect fish habitat if it is connected via overland channel flow to a watercourse to the northeast. It is anticipated based on current observations that conservatively, the site would be considered low from a sensitivity perspective (lack of flow permanency, indirect fish habitat) and therefore works could be addressed using Fisheries and Oceans Canada’s (DFO) self-assessment process.

The Barn Swallow and Bank Swallow forage over open land (grasslands, croplands, water bodies, etc.). Bank Swallow nest in eroded sand banks and are known to nest in fill piles. No such features occur within or adjacent to the ROW. Barn Swallow nest primarily in manmade structures (barns, sheds, under bridges and in open box culverts, etc.). Culverts associated with drainage features within the project limits are small, corrugated steel pipes and hence do not provide potential nest sites. The Bobolink and the Eastern Meadowlark nest and forage in open grasslands/pastures. Though portions of the ROW contain grasslands, the ROW itself does not provide a large enough area to support successful nesting of either species should they occur in grasslands that abut the ROW. Therefore, the ROW does not function as habitat on which these Threatened species depends, directly or indirectly, to carry on its life processes.

Woodlands having value as habitat are relatively large and mature, providing an abundance of large trees containing cavities, loose bark and other features useful as cover for bats. Linear features like hedgerows and areas of scattered trees are not considered bat maternity roost habitat. Therefore, woodlands of potential value to bats occur outside of the ROW.

There are no wetlands located within or adjacent to the ROW in the vicinity of the proposed road works and hence there will be no direct impact to wetland habitat or related functions. The proposed road works do not involve alterations to drainage patterns having the potential to impact flow conveyance from the ROW to adjacent wetlands.

6.1.3 Social Environment

The main impacts to the social environment are anticipated to be to the residential properties located adjacent to both 10th Sideroad and the 6th Line. The potential for significant impacts to driveway grades, property frontages, and landscaping features may be realized under the various alternatives. Where impacts to existing properties cannot be mitigated, acquisition of additional property may be required.

6.1.4 Economic Environment

For this project, the economic environment considered consisted primarily of preliminary costs associated with construction. In addition to the aforementioned, impacts to adjacent lands, which would have associated costs to procure property, were also considered under this element; however, no specific costing was assigned to these potential acquisitions.

6.2 Evaluation Criteria

The completion of the evaluation considered a number of factors, which were separated into nine evaluation criteria. These criteria and their associated elements are listed below:

Safety Improvements

- roadway geometry and vertical alignments
- sightlines
- road-side safety

Driveway Impacts

- driveway accessibility & operations
- driveway regrading
- driveway realignment

Utility Impacts

- utility relocations

Stormwater Management

- existing drainage impacts

Constructability

- flexibility and ease of construction
- natural environment Impacts
- cultural/heritage environment impacts

Traffic Impacts

- mobility improvements
- traffic operations
- capacity/Congestion

Construction Costs

- overall project costs

Property Impacts

- property acquisitions
- property regrading

Mitigation of Impact

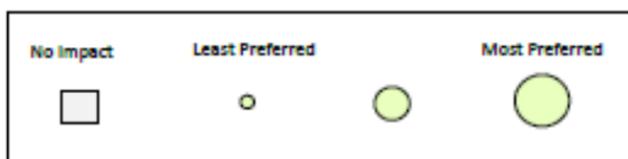
- severity of impacts
- mitigation opportunities
- natural environment impacts
- cultural/heritage environment impacts

6.3 Evaluation Summary

In order to select a recommended solution, the proposed alternatives were evaluated with respect to their impact on the existing environment using the aforementioned criteria. To assist in the selection of the recommended solution, an evaluation matrix was developed to compare the potential for impact using a visual scoring method. As illustrated in the evaluation matrix, each alternative was assigned one of four visual markers to represent the potential for impact on each of the evaluation criteria. The largest circle represents the most preferred option, as it will address the key concerns, but creates the least amount of environmental impact. The middle size circle addresses key concerns in a limited capacity and/or has the potential to impact the environment to a lesser degree. The smallest circle is indicative of a least preferred option as it has a higher potential to impact the environment. A square indicates that no significant difference exists between the alternatives. The results of the evaluation completed for this project are summarized in the Evaluation Matrix on page 27 of this report.

Table 3: Evaluation Matrix

Evaluation Criteria	How Criteria Are Being Assessed	Alternative A Do Nothing		Alternative B 80 km/h Posted Speed Geometric Improvements		Alternative C Geometric & Operational Improvements		Alternative D Signalization	
		Impact	Description	Impact	Description	Impact	Description	Impact	Description
Safety Improvement	Improves sightlines, Improves roadway geometrics	○	No improvements to sightlines, geometrics and safety. Does not address problem statement.	●	Greatest improvements to sightlines and safety, no improvement to hazard awareness	●	Significant impact on sightlines, and safety, improves hazard awareness	●	Improved safety, improves hazard awareness and intersection operations
Driveway Impacts	Impacts on driveway accessibility and operations	●	No impacts to existing driveways	○	Significant impacts on driveway grades, maximums likely to be exceeded.	●	Moderate impacts on Line 6, grades within standards. SR 10 driveways will need extension.	●	No impacts to existing driveways
Utility Impacts	Extents of utility relocation required	●	No impacts to existing utilities.	○	Requires more significant relocations at intersection including OPI cabinet and further relocations at approaches.	○	Require relocation of utility poles and underground Bell cabling at intersection.	○	Requires installation of poles and traffic signals elements. No major utility relocations anticipated.
Stormwater Management	Ability to accommodate drainage and storm flows compared to existing	□	No significant difference between alternatives	□	No significant difference between alternatives	□	No significant difference between alternatives	□	No significant difference between alternatives
Constructability	Flexibility and ease of construction	●	No construction required	○	Greatest volume of excavation required for off-site handling and disposal.	●	Significant volume of earthworks required.	●	Minor localized grading at intersection
Traffic Impacts	Through traffic mobility improvements, Traffic operations improvements, Increased capacity, reduced congestion	○	No Improvement to geometrics and does not allow unencumbered flow.	●	Improves geometrics to standard and allows unencumbered flow.	●	Promotes freer flow of traffic.	○	Promotes safer flow of traffic and advanced warning.
Construction Cost	Project costs for construction	●	No Construction Cost	○	\$3,500,000	●	\$2,600,000	●	\$862,500
Property Impacts	Magnitude of property acquisitions required to implement	●	No property acquisitions required.	○	Moderate land acquisition required in the vicinity of the intersection.	○	Moderate land acquisition required primarily at approaches to accommodate fills.	●	No property acquisitions required.
Mitigation of Impact	Severity of Impact, ability to mitigate with localized slope stabilizations, retaining walls, etc.	●	No impacts and no mitigation required	○	Significant impact at the intersection and approaches	○	Significant impact at the intersection and approaches	○	Primarily localized impacts at the intersection.
									RECOMMENDED SOLUTION



7. CONSULTATION

7.1 Notice of Commencement and Public Information Centre

A Notice of Study Commencement and Public Information Centre (PIC) that was to be held on October 8, 2019 was placed in the New Tecumseth Times and Alliston Herald newspapers for the September 26, 2019 and October 3, 2019 editions and a copy of the notice was also posted on the Town of New Tecumseth website.

The Ministry of the Environment, Conservation and Parks (MECP) was contacted to confirm which Indigenous communities should be contacted as part of this project as per the current protocol. In accordance with the MECP direction, the following communities were consulted with as part of this process:

- Métis Nation of Ontario
- Georgian Bay Métis Council
- Métis National Council
- Beausoleil First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Rama First Nation
- Chippewas of Saugeen
- Huron-Wendat Nation
- Chippewas of Nawash First Nation

A mail out to area residents within proximity of the study area, relevant review agencies as well as several Indigenous communities was issued on September 23, 2019 providing notification of the commencement of the project, Class EA process, PIC, and inviting comment regarding the project. A copy of the issued letters, notices, as well as the agency and Indigenous mailing lists are provided in **Appendix 'D'**.

7.2 Public Information Centre

An informal, drop-in style Public Information Centre was held from 5:30 p.m. to 7:30 p.m. on Tuesday October 8, 2019 at the Tottenham Community Centre located at 139 Queen Street North

in Tottenham. Representatives from both the Town of New Tecumseth and the Ainley Group were in attendance. Twenty four (24) separate entries were recorded on the provided sign-in sheets, consisting primarily of local residents.

The PIC provided information pertaining to the Municipal Class EA Schedule 'B' planning process and its application to the current project. The scope of the project and location of the study area were identified. A description was provided of the existing conditions and deficiencies impacting the existing study area. Four (4) Alternative Solutions to address the identified deficiencies were presented to the public for their review and input. It was further indicated that the alternative solutions were developed to address the identified deficiencies. It was also indicated that a Preferred Solution to address the identified deficiencies would be selected based on an evaluation of their potential to impact the environment (physical, natural, social and economic).

Comment sheets were provided at the PIC to assist individuals in expressing their opinions and any concerns. The public was informed that a two-week comment period would follow the PIC, ending October 22, 2019. Approximately eighteen (18) individual inquires, comment sheets, emails and letters from local residents and members of the public were received. A copy of the aforementioned PIC material can be found in **Appendix 'D'** of this report along with copies of all comments received from agencies, Indigenous communities, and the public. Response letters to comments received were sent out on November 26, 2019. A Comment Summary Table which provided a summary of comments received and the Project Team's responses was created and attached to the response letters. For the purposes of the comment summary table, if comments were lengthy, they may have been paraphrased to include only what were interpreted to be the key points. Further, if multiple comments were received with similar points, they have not all been repeated within the summary. A copy of the Comment Summary Table and response letter can be found in **Appendix 'E'** of this report.

7.3 Notice of Completion

This Notice announced the completion of the Class EA process, filing of this Project File Report and identified the locations available to review Project File Report. The notice also provided direction for the submission of a Part II Order request. It is intended for the Notice to be published in the New Tecumseth Times and the Alliston Herald in editions January 30, 2020 and February 6, 2020. The Notice will be posted on the Town of New Tecumseth website and copies of the Notice will be mailed out to all relevant agencies, Indigenous communities and public members. A copy of all correspondence is included in **Appendix 'F'** of this report.

8. SELECTION OF THE RECOMMENDED SOLUTION

During the course of the Class EA process, the alternatives sought to identify appropriate roadway and intersection improvements to reduce the potential occurrence and severity of accidents and collisions in the study area. Given the 10th Sideroad's ultimate classification as an arterial roadway, initial alternatives sought to improve safety in the area through changes in roadway geometrics that would rectify deficiencies and bring the road corridor in line with its classification. However, after evaluation, it was determined that the impacts to the environment were too severe to improve the corridor to a design standard in line with an arterial roadway, most notably in achieving the minimum sightlines and standards required for a posted 80 km/h speed limit.

Following the completion of the Public Information Centre and a review of all comments received from review agencies, Indigenous communities, stakeholders and the public the following alternative was selected as the recommended solution: Alternative D – Signalization. The installation of traffic signals is not based on volume warrants or historical collision data, but rather to provide protected movement through the intersection to address sight line issues at this location.

It is anticipated that the traffic signal system would be set such that 10th Sideroad would rest on green until a vehicle on the 6th Line actuates a call for green on the side road. Appropriate advanced warning elements would be placed in advance of the intersection and the posted speed would remain unchanged from existing. Preliminary Drawings can be found in **Appendix 'G'**, with details to be confirmed during the detail design phase.

The preliminary costs required to facilitate the construction of the recommended solution have been estimated at \$862,500. A breakdown of the associated costs are outlined below and include construction costs of the signals, the road improvements, and engineering costs for the detailed design, contract administration and site inspections.

Table 4: Preliminary Cost Estimate for Recommended Solution

	Cost
Intersection Signalization	\$400,000
Road Improvements	\$350,000
Engineering Costs	\$112,500
Total	\$862,500

In order to address some of the comments received from the public, the following sections provide clarification on key aspects of the recommended solution:

Difficulty Stopping/Starting on Steep Approach Grades (particularly in winter conditions)

Based on 2017 traffic counts, the highest peak hour volume recorded on 10th Sideroad in the area of the intersection was 241 cars, which equates to 4 cars/minute. Similarly, the highest peak hour volume recorded for 6th Line in this area was 42 cars, which equates to 0.7 cars/minute. The total cycle length of the proposed signal would be no more than a half minute, meaning that only two cars would potentially be stopped on 10th Sideroad waiting for the signal to change. The existing grades on both approaches up the hill is approximately 8%. However, this flattens out as you approach the crest of the hill. Based on the proposed positioning of the stop bar, the slope of the hill in the location of the stopped cars would be 2.4% on the north leg and 1.0% on the south leg of the intersection.

The Town would continue to complete seasonal roadway maintenance within the area in accordance with Provincial Standards.

Visibility of Traffic Signals and Lack of Reaction Time When Light Changes

The standard assumed driver's eye height is 1.05 m. The standard height for traffic signal head placement is 5.0 m over travelled lanes. Setting the driver's eye height along the existing road profile and the signals at 5 m above the intersection confirms that the signals will be easily and continuously visible from all points on the approach to the hill and up the hill. Advanced signal warnings can still be used to caution driver's to "prepare to stop" should a demand be actuated from the 6th Line.

North and Southbound Left Turning Movements

The concern of vehicles on 10th Sideroad having sufficient time to comfortably and safely make a left turn onto the 6th Line is a valid one and to address it, we recommend that dedicated left turn lanes be implemented. The traffic signal system could be set such that if a vehicle actuates a call to make a left turn, the light on 10th Sideroad would change to red and following a short green cycle length for the 6th Line, the sequence would commence with an advanced left turn only signal.

Key advantages of the recommended solution include:

- Provides improved safety through signalization of intersection, protecting traffic movements.

- No impacts to natural heritage features.
- No direct impacts to cultural heritage features.
- Least impacts to property.
- Least costly alternative to implement.

Key disadvantages of the recommended solution include:

- Does not address geometric deficiencies in the roadway.
- The posted speed limit would not change and would remain lower than what would typically be consistent with an arterial roadway.

Council Endorsement of Recommended Solution

The draft Project File Report, including the Recommended Solution, was included in the Committee of The Whole Meeting Agenda dated December 9, 2019. The agenda and the draft Project File Report were available for viewing by the public on the Town of New Tecumseth's website. The Committee of the Whole meeting was conducted on December 9, 2019 at 7:00 p.m. in the Council Chambers at the Town's Administration Centre in Alliston, Ontario. Members of the general public were present and posed questions and concerns to Council for discussion. Ainley Group was on hand to field questions posed by Council and elaborate on the information presented in the draft Project File Report. Subsequently, Council requested that an additional information memorandum be prepared to clarify and respond to inquiries and concerns presented by the public, which primarily focused on speed limits, sight lines, geometric design, and installation and timing of traffic signals.

A memorandum was included for information in the Council Meeting agenda for December 23, 2019 and was publicly available on the Town's website. A summary of key advantages and key disadvantages were also included to aid in Council's discussions. A copy of the memorandum can be found in **Appendix 'H'** of this report.

The draft Project File Report was received by Council during the meeting on December 23, 2019 held at the Town's Administration Centre in Alliston, Ontario. Council put forth a motion that in addition to the implementation of the Recommended Solution, being traffic signals, the detailed design phase of the project is to include provisions for the improvement of the vertical geometrics for the 10th Sideroad and 6th Line intersection to the extent possible without causing negative impacts to the surrounding lands and at a cost less than the next most expensive option

considered. Further elements to be considered during the detailed design phase of the project are to include the concerns brought forth by the public pertaining to the ingress and egress from adjacent properties, driveway grades, and sight lines.

9. MITIGATION AND MONITORING

The following sub-sections outline the mitigation and monitoring measures that should be considered in the development of the detailed design for the site, during construction, and beyond.

9.1 Fisheries, Surface Water, and Groundwater

The following mitigation measures are recommended to minimize impacts to associated fish and fish habitat. As no-in water work are proposed, impacts are expected to be minimal provided standard measures for working near water are implemented during construction:

- Sediment and erosion controls should be implemented during construction to provincial and municipal standards to minimize the effects of siltation and erosion and to ensure that no deleterious substances are discharged to adjacent natural-heritage features.
- Sediment and erosion controls should be regularly monitored and maintained in optimal condition until soil has been stabilized.
- Any fill material deposited should conform to the fill-quality standards of the relevant regulatory authority. No fill material should be placed in any watercourse.
- Excess construction materials should not be deposited in any watercourse or anywhere else where they could be introduced to the aquatic environment.
- Re-fueling and the maintenance of construction equipment should be completed away from water to minimize the possibility of water and sediment contamination. An emergency spill response kit should be on site at all times. In the event that a spill occurs, proper containment, clean up and reporting would be required in accordance with provincial requirements.

9.2 Vegetation

It is not expected that construction will significantly impact area vegetation provided mitigation measures as noted below are implemented during construction:

- As trees within the ROW have potential to contain bird nests, any tree or shrub removal should be completed outside of the woodland bird nesting window as defined by Environment Canada for this part of the province as extending from April 1 through August 31. Trees should be examined before removal to ensure no nesting birds are present.
- Fencing should be placed prior to construction to prevent accidental intrusion into adjacent environmental areas and to protect existing trees, where necessary.
- A restoration plan with the objective of stabilizing areas of exposed soils as soon as possible based on timing of work should be developed. A “roadside grass and forb seed mix” containing native/naturalized/non-invasive species would be preferred.

9.3 Wildlife and Species at Risk

- To avoid any impacts to endangered bats, tree clearing is to be completed outside the “bat active season” generally considered to extend from May 1 through October 31.
- The work associated with the recommended solution is beyond 50 m of the identified Butternut trees within the study area; therefore, a Butternut Health Assessment (BHA) would not be required. As a result, authorization under Ontario’s ESA is not required prior to the proposed works being initiated.

9.4 Air Quality

Best Management Practices should be implemented during construction to maintain air quality, including:

- No unnecessary idling of vehicles during construction.
- Stockpiles of soil, sand and aggregate should be covered.
- Construction sites and access road should be regularly cleaned to remove debris and dust caused by construction.
- Non-chlorinated dust suppressants should be applied to control dust generated by construction activities.

9.5 Land Use/Property

The following mitigation is recommended to reduce the potential for impact to area land use and adjacent properties:

- Access should be maintained to all entrances during construction and advance notice of work should be provided to landowners in proximity to the project.

- Efforts should be made to ensure that impacts to traffic are kept to a minimum through the use of construction staging and other methods to ensure that traffic flow continues during the construction process.

Should opportunity arise in the future to purchase adjacent property in the vicinity of the area, through development applications or otherwise, the Town should be proactive in securing such property in an effort to ultimately address the geometric deficiencies in the roadway.

9.6 Noise

The measures recommended below will assist in minimizing noise impacts:

- It is recommended that the contractor be required to provide advance notice of the work to landowners in proximity to the project and that a contact person be identified in the correspondence should there be any complaints or concerns.
- Equipment should be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.

9.7 Utilities and Servicing

On-going consultation with utilities will be required during detailed design and construction of the project to secure a power supply for the proposed signalization and to ensure that any concerns are addressed.

9.8 Contamination and Waste Management

Excess material will require proper management (removal, storage and disposal). Materials should be managed in accordance with OPSS 180 – General Specification for the Management of Excess Materials. Direction should be included in the contract documents relating to actions to be taken in the event that contaminated material is encountered during construction.

9.9 Archaeological Resources

As work would be completed within the existing ROW, it is not anticipated that the following situations will be encountered; however, in the event that they are encountered during construction, the contractor should be advised to stop work immediately and take the appropriate actions as noted below:

- Should previously unknown or unassessed deeply buried archaeological resources be uncovered, they may be a new archaeological site and therefore subject to section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with section 48 (1) of the *Ontario Heritage Act*. The Heritage Operations Unit of the Ministry of Culture must be immediately notified at 807-468-2450.
- In the event that human remains are encountered during construction, the proponent or person discovering human remains must immediately notify the police or coroner and the Registrar of the Bereavement Authority of Ontario at 647-483-2645 or 1-807-468-2450.

9.10 Monitoring

Information pertaining to required mitigation and monitoring will be incorporated into the Construction Documents once the detailed design has been finalized. Monitoring will be conducted by on-site construction staff to make certain that environmental protection measures are being implemented and are effective. The Contract Administrator will make certain that environmental protection measures and monitoring, as identified, are implemented during construction and that any repairs to protection measures will be made in a timely fashion. Monitoring following construction will be completed by the Town, as required.

10. CLIMATE CHANGE

Climate change concerns relate to the increased concentration of greenhouse gases in the atmosphere, which can result in a rise in the global mean surface temperature. Increased temperatures worldwide are creating changes in climate that is resulting in extreme weather events. The rise of greenhouse gas emissions is influencing climate patterns, hydrology, ecosystems and ocean chemistry.

There are two approaches to address climate change. These include reducing a project's impact on climate change (climate change mitigation) and increasing the local ecosystem's resilience to climate change (climate change adaptation). This section of the report will discuss the aforementioned aspects in relation to this project utilizing a qualitative approach.

10.1 Potential for Project to Impact Climate Change

The current undertaking is a small scale project involving the reconstruction of an existing intersection. As it is a transportation project, the impacts to climate change relate to vehicular greenhouse gas emissions. The reconstruction will maintain an adequate level of service post construction with minimal delays and it is not expected that the emission of greenhouse gases will significantly increase over existing conditions.

10.2 Potential for Climate Change to Impact this Project

Climate change has the potential to result in increased storm events that can lead to flooding. The area of 10th Sideroad and 6th Line is a small scale project and although it will be required to add some asphalt area for auxiliary lanes as well as sections of curb and storm sewer to reduce the limits of construction and minimize impacts to property, an increased risk of flooding is not anticipated.

11. REFERENCES

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