CLASS ENVIRONMENTAL ASSESSMENT STUDY

AIRPORT ROAD from 100 metres north of King Street to 300 metres north of Huntsmill Drive, Town of Caledon

Environmental Study Report
September, 2021

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List of Acronyms and Abbreviations

ANSI – Area of Natural and Scientific Interest
AODA – Accessibility for Ontarians with Disabilities Act
ASE – Automated Speed Enforcement
ASM – Agricultural Source Material
AT – Active Transportation
BHR – Built Heritage Resource
BLOS – Bicycle Level of Service
CAAQS – Canadian Ambient Air Quality Standards
CHVI – Cultural Heritage Value or Interest
CNR – Canadian National Railway
CSP – Corrugated Steel Pipe
CTC – Credit Valley, Toronto and Region, and Central Lake Ontario
CVC – Credit Valley Conservation
CWA – Clean Water Act
CWG – Community Working Group
DBH – Diameter at Breast Height
DFO – Department of Fisheries and Oceans Canada
DNAPL – Dense Non-Aqueous Phase Liquid
EA – Environmental Assessment
EB - Eastbound
EASR – Environmental Activity and Sector Registry
ELC – Ecological Land Classification
ESA – Endangered Species Act
ESA – Environmentally Significant Area
ESC – Erosion and Sediment Control
ESR – Environmental Study Report
GO – Government of Ontario
GTA – Greater Toronto Area
ha - Hectare
HCM – Highway Capacity Manual
HDF – Headwater Drainage Feature
HIA – Heritage Impact Assessment
HVA – Highly Vulnerable Aquifers
HWFN – Huron-Wendat First Nation
ITE – Institute of Transportation Engineers
km - Kilometre
km/h – Kilometre per Hour
LID – Low Impact Development
LOS – Level of Service
MCFN – Mississaugas of the Credit First Nation
LRTP – Long Range Transportation Plan
MEA – Municipal Engineers Association
MECP – Ministry of Environment, Conservation and Parks
MMLOS – Multi-Modal Level of Service
MNRF – Ministry of Natural Resources and Forestry
MTO – Ministry of Transportation Ontario
MUP – Multi-Use Path
NASM – Non-Agricultural Source Material
NB - Northbound
NEP – Niagara Escarpment Plan
NHIC – Natural Heritage Information Centre
OGS – Oil and Grit Separator
OP – Official Plan
OPSS – Ontario Provincial Standards and Specifications
OTM – Ontario Traffic Manual
PHC – Petroleum Hydrocarbons
PHDZ - Peel Health Data Zone
PIC – Public Information Centre
PLOS – Pedestrian Level of Service
PPS – Provincial Policy Statement
PSW – Provincially Significant Wetland
PTE – Permission to Enter
PTTW – Permit to Take Water
ROP – Regional Official Plan
ROW – Right-of-Way
RSSP – Road Safety Strategic Plan
RT – Right Turn
SAR – Species at Risk
SB - Southbound
SGMN – Strategic Goods Movement Network
SGRA – Significant Groundwater Recharge Area
SPP – Source Protection Plan
STS - Sustainable Transportation Strategy
TAC – Technical Advisory Committee
TAC – Transportation Association of Canada
TDM – Transportation Demand Management
TMC – Turning Movement Counts
TMP – Transportation Master Plan
TRCA – Toronto and Region Conservation Authority
VOC – Volatile Organic Carbon
vhp – Vehicles Per Hour
v/c – Volume to Capacity Ratio
WB - Westbound

LSW – Locally Significant Wetland
LT – Left Turn
m – Metre
mm – Millimetre
M - Million
WHPA – Wellhead Protection Area

1. INTRODUCTION

1.1 Study Purpose

The Region of Peel (Region) has completed a Schedule C Municipal Class Environmental Assessment (Class EA) Study for improvements to Airport Road from 100 metres (m) north of King Street to 300m north of Huntsmill Drive in Caledon.

The Study examined the need for improvements on Airport Road to address long term issues related to planned future growth and to enhance safety for all road users. The Study further examined options to address the need for road improvements, including intersection improvements, roundabouts, traffic calming measures, and infrastructure improvements for walking and cycling.

This Environmental Study Report (ESR) documents the planning, design and consultation process that led to the preferred solution and design concept for improvements to Airport Road. The ESR describes the potential environmental impacts of the preferred plan and outlines mitigation measures to eliminate or reduce negative impacts.

1.2 Study Area

The Study Area includes approximately 7.5 kilometres (km) of Airport Road (Regional Road 7) from 100m north of King Street (Regional Road 19) to 300m north of Huntsmill Drive within Caledon. The Study Area also includes 300m along all legs of each intersection within the Study limits.

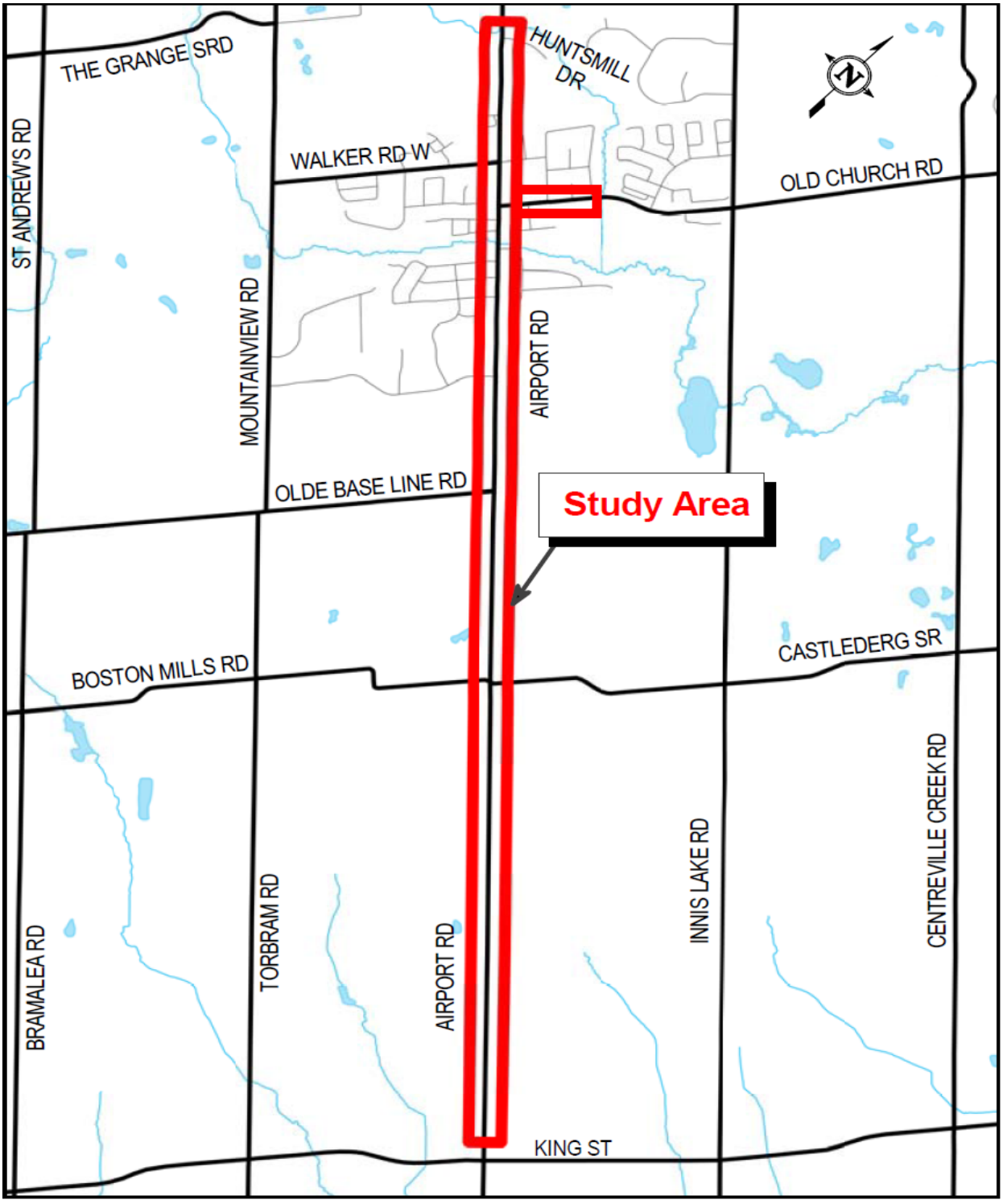
Airport Road within the Study limits is a major north-south arterial road under the jurisdiction of the Region that extends through the communities of Mono Road and Caledon East. The current configuration of Airport Road within the Study Area provides two travel lanes (one northbound and one southbound).

The Study limits were expanded during the Class EA to include approximately 500m of Old Church Road from Airport Road to the furthest east intersection at Marilyn Street. The expanded Study Area provided an opportunity to connect potential active transportation facilities to the existing Multi-Use Path (MUP) on Old Church Road east of Marilyn Street.

Old Church Road within the Study limits is an east-west major arterial road under the Region's jurisdiction. The current configuration of Old Church Road within the Study Area provides for two travel lanes (one eastbound and one westbound).

See Figure 1 for a map of the Study Area. Additional details on the existing road network within the Study Area can be found in Section 3 below.

Figure 1: Study Area



1.3 Study Team

The Class EA Study was carried out by the Region with technical support by IBI Group (IBI).

The Region:

- Managed the Class EA Study process,
- Consulted with the public, indigenous communities, and review agencies,
- Evaluated alternative planning and design solutions,
- Completed the preliminary design for the preferred solution, and
- Prepared the ESR in partnership with IBI.

IBI and their consulting team completed technical studies to:

- Justify the need for improvements,
- Assess the environmental impacts of alternative planning and design solutions,
- Identify measures to mitigate environmental impacts,
- Provide technical input to all components of the Class EA Study undertaken by the Region, and
- Prepare the ESR in partnership with the Region.

The Region's Project Team represented the following areas of specialty:

Department	Division or Section
Public Health	Health Services (Active Living (Walking Audit), Built Environment & Health Protection)
Public Works	Engineering Technical Services (Data & Topographic Survey) Development Services Roads Operations and Maintenance Infrastructure Programming and Studies (Project & Stormwater Management) Sustainable Transportation Traffic Engineering (Operations, Safety, Development and Signals & Streetlighting) Transportation System Planning Water and Wastewater
Corporate Services	Real Estate regarding: Permission to Enter for field Investigations Property Impacts

IBI and their consulting team provided technical expertise in the following areas of specialty:

Prime Consultant	Area of Specialty
IBI	Active Transportation Consultant Project Management Drainage and Stormwater Management Environmental Planning Roundabout Design (Peer Review) Structural Engineering Traffic Operations and Safety Virtual Public Consultation and Survey
Sub-Consultants	**Area of Specialty**
Archaeological Services Inc. (ASI)	Archaeology Cultural Heritage
GEO Morphix Ltd. (GEO Morphix)	Fluvial Geomorphology
RiverStone Environmental Solutions Inc. (RiverStone)	Natural Environment Impacts Tree Inventory
RWDI Air Inc. (RWDI)	Air Quality Noise
Terraprobe Inc. (Terraprobe)	Contamination Overview Geotechnical and Pavement Design Hydrogeological Investigation

Additional technical services were provided by:

- Toronto and Region Conservation Authority (TRCA) for Natural Environment Existing Conditions, and
- Trans-Plan Transportation Inc. (Trans-Plan) for a Parking Study on Airport Road in Caledon East.

1.4 Study Schedule

The Class EA Study was initiated in September 2017 and completed in Fall 2021 after meeting the following milestones:

Milestone	Date
Study Commencement	September 7, 2017
Technical Advisory Committee (TAC) Established	October 25, 2017
Community Working Group (CWG) Established	November 13, 2017
Public Information Centre for Phases 1 and 2 of the Class EA	June 4, 2018
Public Information Centre for Phase 3 of the Class EA	September 23, 2020
Study Completion	Fall 2021

2. CLASS ENVIRONMENTAL ASSESSMENT

2.1 Planning and Design Process

The Class EA Study followed the guidelines of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011, and 2015). The MEA Municipal Class EA process includes five phases of planning and design:

Phase 1 **Identify the problem and/or opportunity for the project.**

Phase 2 **Identify and evaluate alternative solutions** to address the problem and/or opportunity with consideration for the environment, and establish the preferred solution with consideration for public and review agency input.

Phase 3 **Identify and evaluate alternative design concepts** for the preferred solution with consideration for the environment, and establish the preferred design concept with consideration for public and review agency input.

Phase 4 **Document the Class EA Study**, including the planning, design, and consultation process in an ESR for public review.

Phase 5 **Complete the detailed design, prepare the contract drawings and documents, and proceed to construction and operation**. Monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facility.

The MEA Municipal Class EA further classifies projects into four schedules:

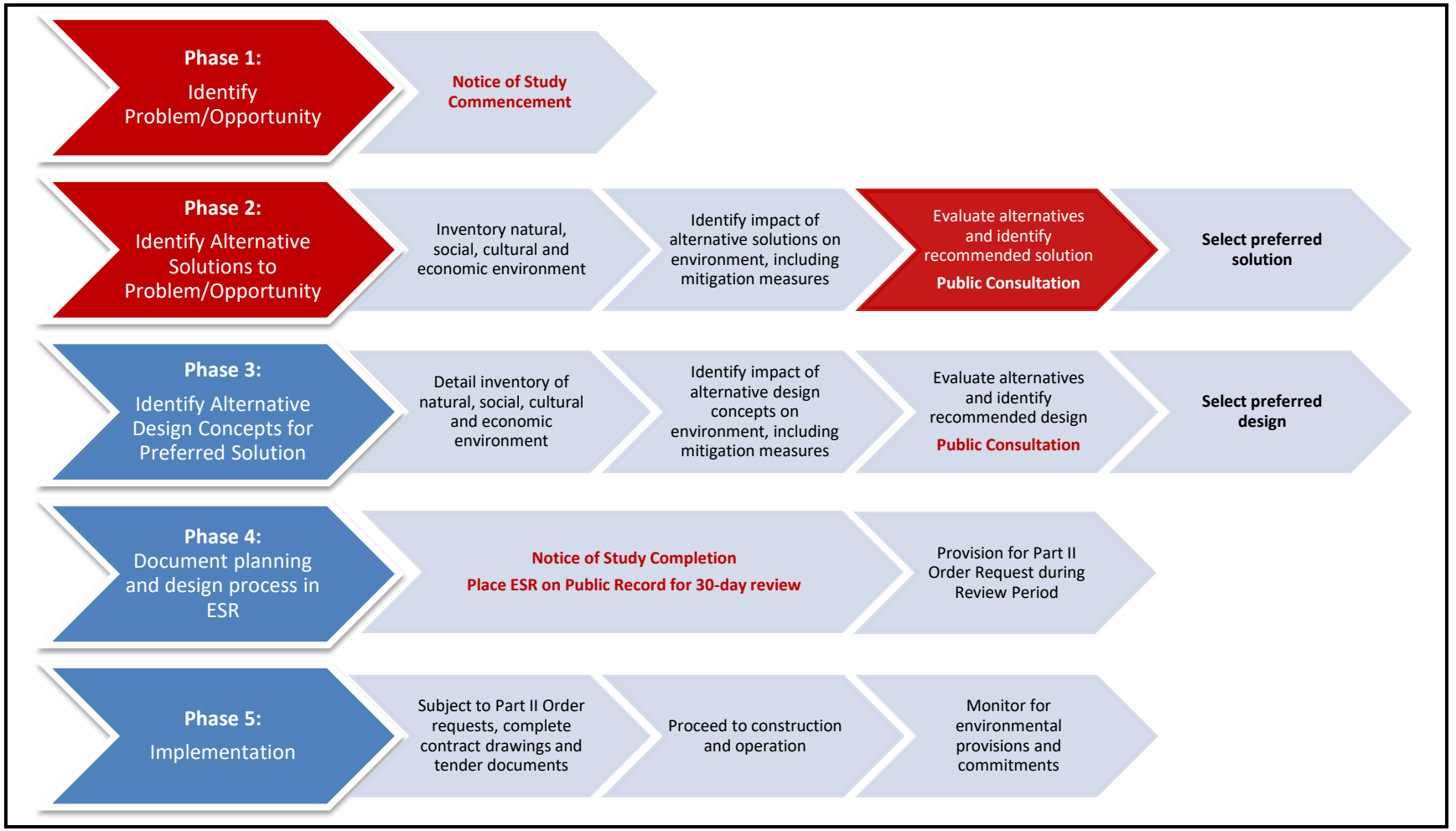
Schedule A Projects that involve minor modifications to existing facilities. The environmental impacts of these projects tend to be small and as such are considered pre-approved.

Schedule A+ Projects that involve minor modifications to existing facilities. The environmental effects of these projects tend to be small. The public must be notified of these projects to be considered pre-approved.

Schedule B Projects that involve improvements and minor expansions to existing facilities and that have potential for some adverse environmental impacts. The proponent is required to proceed through a screening process including consultation with parties that are affected by the project. These projects proceed through Phases 1, 2 and 5 of the Municipal Class EA process (see **Figure 2**).

Schedule C Projects that involve the construction of new facilities and major expansion of existing facilities. These projects proceed through Phases 1 to 5 of the Municipal Class EA process (see Figure 2).

Figure 2: Municipal Class EA Process



The Class EA for the Airport Road Study corridor was initiated as a Schedule C project. Table 1 identifies the project descriptions in the MEA Municipal Class EA that could apply to the potential range of road improvements, including mitigation. The highest level of assessment required among the potential project descriptions is Schedule C, which would allow for an enhanced consultation program. This Schedule was later confirmed during Phase 2 of the Study.

Table 1: MEA Municipal Class EA Project Descriptions and Schedules

General Operation and Maintenance of Linear Paved Facilities and Related Facilities	
Construction or removal of sidewalks or multi-purpose paths or cycling facilities within existing or protected rights-of-way	Schedule A
Urban: Resurfacing, with no change to horizontal alignment Rural: Resurfacing, with no change to horizontal alignment	Schedule A
Streetscaping (e.g., decorative lighting, sidewalk improvements, benches, landscaping not part of another project)	Schedule A+
Construction of localized operational improvements at specific locations	Schedule A+
Installation, construction or reconstruction of traffic control devices (e.g., signing, signalization)	Schedule A if less than $9.5 million (M) Schedule B if greater than $9.5M
Construction of a new culvert to increase culvert size due to change in drainage area	Schedule A+
Reconstruction where the reconstructed road or other linear paved facilities (e.g., HOV lanes) will be for the same purpose, use, capacity and at the same location (e.g., addition or reduction of cycling lanes/facilities or parking lanes, provided no change in the number of motor vehicle lanes)	Schedule A+
Construction of new roads or other linear paved facilities (e.g., HOV lanes)	Schedule B if less than $2.4M Schedule C if greater than $2.4M
Miscellaneous Projects	
Construction of noise barriers, i.e. structures such as walls and berms or a combination of the two	Schedule A+

2.2 Public Review Period

This ESR will be available for public review for a minimum of 30 calendar days. A Notice of Study Completion will be placed in two separate editions in each of two local newspapers (Caledon Enterprise and Caledon Citizen) to announce the review period. The ESR will be available on the Project Website at https://www.peelregion.ca/pw/transportation/construction/environmental-assessment/airport-road-caledon.asp.

During this time, interested persons may provide written comments to the Project Team. All comments and concerns should be sent directly to the Project Manager at the Region.

In addition, a request may be made to the Ministry of the Environment, Conservation and Parks for an Order requiring a higher level of study (i.e. requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g. require further studies), only on the grounds that the requested Order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name.

Requests should specify what kind of Order is being requested (request for conditions or a request for an individual/comprehensive EA), how an order may prevent, mitigate, or remedy potential adverse impacts on Aboriginal and treaty rights, and any information in support of the statements in the request. This will ensure that the Ministry is able to efficiently begin reviewing the request.

The request should be sent in writing or by email to:

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

and to

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

Requests should also be copied to the Region's Project Manager by mail or e-mail:

Sonya Bubas, MCIP, RPP
Project Manager, Infrastructure Programming and Studies
Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9
sonya.bubas@peelregion.ca

Please visit the Ministry's website for more information on requests for Orders under Section 16 of the Environmental Assessment Act at: https://www.ontario.ca/page/class-environmental-assessments-part-ii-order.

All personal information included in your request, such as name, address, telephone number and property location is collected under the authority of Section 30 of the Environmental Assessment Act and is collected and maintained for the purpose of creating a record that is available to the general public. As this information is collected for the purpose of a public record, the protection of personal information provided in the Freedom of Information and Protection of Privacy Act (FIPPA) does not apply (s.37). Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential.

This Class EA Study was conducted in accordance with the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA). With the exception of personal information, all public comments received by the Region during the EA process will become part of the public record.

3. NEED AND JUSTIFICATION

3.1 Transportation Planning and Policy

Several polices, studies and plans were reviewed to understand the broader transportation planning framework for the Study Area and the potential need for improvements to Airport Road.

3.1.1 Provincial Planning and Policy Context

Provincial Policy Statement (2020)

Under the Planning Act, the Provincial Policy Statement (PPS) sets overall policy directions on matters of Provincial interest. It provides for appropriate development, while protecting resources of Provincial interest, public health and safety, and the quality of the natural environment.

Municipal planning decisions must be consistent with the PPS. Section 1.6.8 of the PPS outlines the policies for Transportation and Infrastructure Corridors. Policies most relevant to the Airport Road Study corridor include:

"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."

"1.6.8.2 Major goods movement facilities and corridors shall be protected for the long term."

"1.6.8.6 When planning for corridors and rights-of-way for significant transportation, electricity transmission, and infrastructure facilities, consideration will be given to the [wise use and management of] significant resources [including natural heritage, water, agriculture, minerals and petroleum, mineral aggregate resources, cultural heritage and archaeology]."

The PPS was updated in 2020 and the above policies are consistent with the former 2014 version.

Growth Plan for the Greater Golden Horseshoe (2020)

The Places to Grow Act, 2005, enabled the development of the Growth Plan for the Greater Golden Horseshoe. The Study Area falls within the Greater Golden Horseshoe Growth Plan Area and partially within the Greenbelt Plan Area. Policies for managing growth specify that growth will be limited in settlement areas that are in the Greenbelt Area.

The Growth Plan outlines policies for infrastructure to support growth. Policies most relevant to the Airport Road Study corridor include:

"Section 3.2.3 Moving People

4. Municipalities will ensure that active transportation networks are comprehensive and integrated into transportation planning to provide safe, comfortable travel for pedestrians, bicyclists, and other users of active transportation; and continuous linkages between strategic growth areas, adjacent neighbourhoods, major trip generators, and transit stations, including dedicated lane space for bicyclists on the major street network, or other safe and convenient alternatives."

"Section 3.2.5 Infrastructure Corridors

1. In planning for the development, optimization, or expansion of existing and planned corridors and supporting facilities, the Province, other public agencies and upper- and single-tier municipalities will:

    b) ensure that existing and planned corridors are protected to meet current and projected needs in accordance with the transportation and infrastructure corridor protection policies in the PPS;

    c) where applicable, demonstrate through an agricultural impact assessment or equivalent analysis as part of an environmental assessment, that any impacts on the Agricultural System have been avoided or, if avoidance is not possible, minimized and to the extent feasible mitigated;

    d) where applicable, demonstrate through an environmental assessment, that any impacts on key natural heritage features in the Natural Heritage System for the Growth Plan, key hydrologic features and key hydrologic areas have been avoided or, if avoidance is not possible, minimized and to the extent feasible mitigated; and

    e) for existing or planned corridors for transportation:

        i. consider separation of modes within corridors; and
        ii. provide opportunities for inter-modal linkages."

Greater Toronto Area (GTA) West Corridor Route Planning and EA Study (ongoing)

The Ministry of Transportation Ontario (MTO) initiated the GTA West Route Planning and EA Study in 2014. The purpose of the GTA West study is to plan for a new multi-modal transportation corridor that would potentially include a 400-series highway, a transitway and priority features for goods movement. The GTA West study was suspended from 2015 to 2019, and reconvened in 2020 when a preferred route was selected. The preferred route extends generally east-west from Highway 401/407 in Halton Region to Highway 400 in York Region. On route, the corridor crosses Airport Road north of Old School Road in Caledon (south of the Airport Road Study limit). The GTA West study is scheduled to be completed in 2022; however, the schedule for implementation was unknown at the time of preparing this report.

3.1.2 Regional Planning and Policy Context

Region of Peel Official Plan (2018 Consolidation)

The Region of Peel Official Plan provides direction on land use policies, a sustainable development framework and a long term Regional strategic policy framework for growth. The goals of the Plan are:

"To create healthy and sustainable regional communities for those living and working in Peel which is characterized by physical, mental, economic and social well being; minimized crime, hunger and homelessness; a recognition and preservation of the Region's natural and cultural heritage; and emphasis on the importance of Peel's future as a caring community";

"To recognize, respect, preserve, restore and enhance the importance of ecosystem features, functions and linkages, and enhance the environmental well being of air, water, land resources and living organisms";

"To support growth and development which takes place in a sustainable manner, and which integrates the environmental, social economic and cultural responsibilities of the Region and the Province".

Section 12-2017 of the Region of Peel Official Plan outlines policies for age-friendly planning and Peel's commitment to creating pedestrian, cyclist, and transit supportive infrastructure, which are key components of a healthy community. The outcomes of a healthy community are increased rates of active transportation, improved air quality and greater social connectivity.

Region of Peel Long Range Transportation Plan (LRTP) Updates (2012 and 2019)

The 2012 LRTP Update identified the transportation challenges for Peel and the policies, strategies, and planned road improvements to address those challenges. The challenges include congested roads due to population growth, innovative solutions to facilitate the movement of people and goods, sustainable planning, and protection of the environment.

The 2012 LRTP Update was conducted as a Region-wide Transportation Master Plan, following the Master Plan process described in the MEA Municipal Class EA. The LRTP provided the need and justification for improvements to Airport Road and fulfilled Phases 1 and 2 of the Class EA process. At the time, the LRTP Update identified the need to:

- Widen Airport Road from King Street to Olde Base Line Road to meet existing and future needs. The LRTP recommended up to four through lanes on Airport Road within this section of the Study Area by 2021, and
- Improve other infrastructure such as active transportation facilities to provide efficient movement of people and goods.

Phases 1 and 2 were revisited in this Airport Road Class EA to verify the findings within the LRTP based on local conditions to the Study Area. Further, the LRTP was updated in 2019 to create a 25-year plan that would guide transportation improvements in Peel to 2041. The latest update to the LRTP does not identify the need to widen Airport Road between King Street and Huntsmill Drive.

Region of Peel Active Transportation Study (2012)

The Active Transportation Study indicates a commitment to create long term goals for active transportation improvements within Peel, and provides policies, guidelines, and programs to achieve the goals. Specifically, the study provides a framework to increase the share of walking and cycling trips and create a pedestrian and cycling friendly environment.

Region of Peel Sustainable Transportation Strategy (STS) (2018)

The STS builds on the Region of Peel Active Transportation Plan (2012). The STS outlines policies, programs and infrastructure projects to enable the development of Peel's transportation system where at least 50 per cent of peak period trips are made by sustainable modes of transportation, including cycling, walking, transit, carpooling and telework, by the year 2041.

The STS is supported by two implementation plans for active transportation and transportation demand management. Both plans have timelines for 2018-2022 and set out the short-term priorities, such as upgrading and locating new walking and cycling infrastructure and supporting cycling and walking to and from schools, transit hubs and other community destinations.

Within the Study Area, the STS identified Airport Road from Cranston Drive to Leamster Trail as a Pedestrian Improvement Corridor and noted gaps in the sidewalk on Airport Road north of Olde Base Line Road and Old Church Road. Among the long-term cycling network improvements, the STS recommended a bike lane or buffered bike lane on Airport Road through Caledon East.

Region of Peel Road Characterization Study (2013)

The Road Characterization Study integrates built environment principles with transportation objectives based on land use concepts. The study introduced road character classifications that consider the adjacent land use, context sensitivity and requirements for the existing and future form and function of the sections of roadway.

The study characterizes Airport Road from King Street to Castlederg Side Road as a Suburban Connector; from Castlederg Side Road to Cranston Drive, and from Leamster Trail to Huntsmill Drive, as a Rural Road; and from Cranston Drive to Leamster Trail in Caledon East as a Rural Main Street. The study shows a conceptual cross-section for each road character, which can be adjusted to respond to site specific conditions.

Region of Peel Vision Zero Road Safety Strategic Plan (2018-2022)

The Region developed its Road Safety Strategic Plan (RSSP) under the Council-approved framework of Vision Zero, which sets the ultimate goal of zero fatal and injury collisions for all road users. The RSSP outlines an action plan to deliver improved road safety in the five year period between 2018 and 2022. The action plan includes many countermeasures, of which the following were considered in this Study:

- Roundabouts to address aggressive driving.
- Sightline Clearing / Sight Distance Improvements to improve visibility at intersections.
- Traffic Calming (curb works, rumble strips, reduced lane widths, bump-outs and islands).
- On-street parking as a traffic calming measure.
- Pedestrian Infrastructure such as sidewalks and improved pedestrian crossings.
- Components of Streetscaping Toolbox to create a comfortable and safe walking environment.
- Accessibility for Ontarians with Disabilities Act (AODA) compliance such as accessible pedestrian pushbutton and tactile warning strips.
- Pedestrian Refuge Islands (raised centre medians) to shorten pedestrian crossings.
- Midblock Pedestrian Crossings such as controlled pedestrian crossings between intersections.
- Multi-use Trails such as pathways that are used by cyclist and pedestrians.
- Walking Audit Tool to evaluate and encourage the development of walkable communities.
- Cycling Infrastructure such as multi-use paths, cycle tracks and bike lanes.
- Crossrides (dedicated space) for cyclists to ride across the road without dismounting.
- Enhanced Cyclist Pavement Markings such as green paint across driveways and intersections.
- This Study also applies two initiatives outlined in the RSSP to promote traffic safety in decision-making:
- Multi-modal Level of Service (MMLOS), which considers levels of service offered to pedestrians and cyclists in addition to motorized vehicles.
- Healthy Development Assessment, which measures the health-promoting potential of an EA by including evaluation criteria such as safety and comfort for all road users.

Region of Peel Goods Movement Strategic Plan (2017)

The Goods Movement Strategic Plan developed a goods movement network within Peel with the objective to improve, prioritize and preserve its goods movement corridors. The Plan identifies Airport

Road as a primary north-south strategic goods movement corridor with no truck restrictions. Old Church Road is also identified as an east-west Primary Truck Route.

Region of Peel Goods Movement Strategic Plan Feasibility Study for Caledon East (2015)

In 2012, as a result of a Town of Caledon Council resolution and approval by Region of Peel Council, a feasibility study was undertaken to consider opportunities to divert truck and vehicular traffic around Caledon East. The study determined that some trucks were using Airport Road due to frequent signals and traffic delays with travel to and along Highway 10.

The purpose of the study was to assess the potential to divert through traffic from Caledon East and recommend alternatives to manage north-south truck volumes along Airport Road. It considered a number of alternative corridors for a bypass around Caledon East and found that bypass alternatives would include major natural, social and community impacts. The study recommended that encouraging more traffic to use Highway 10 would be preferred to a bypass.

The traffic analysis undertaken showed that there was sufficient capacity along Airport Road to accommodate traffic demands within a 20-year horizon, although with some congestion within Caledon East. Based on existing and projected traffic volumes to 2031, the study suggested that truck volumes could be accommodated through better use of the existing road network. Speed reduction or traffic calming measures were recommended along Airport Road.

Olde Base Line Road was also identified as a potential east-west connecting truck route between Highway 10 (Hurontario Street) and Airport Road. The study estimated that nearly twenty percent (20%) of trucks travelling northbound along Airport Road would most likely use Olde Base Line Road to reach northwest destinations, thereby reducing the number of trucks travelling through Caledon East.

Olde Base Line Road Feasibility Study (2020)

In conjunction with this Class EA, the Region retained Dillon Consulting to assess the feasibility of upgrading Olde Base Line Road between Highway 10 and Airport Road to accommodate heavy trucks, in order to support goods movement and divert some of the truck traffic flowing through Caledon East via Airport Road. With some upgrades, Olde Base Line Road is considered generally suitable to accommodate some additional truck traffic (approximately 20% of the existing truck traffic on Airport Road).

The feasibility study considered multiple design options that ranged from increasing the right-of-way to providing more space for multiple road users to doing nothing and repaving the road as is to accommodate trucks. The preliminary recommendation is to repave the road and increase the paved shoulder space (staying within the current property limits). The recommended upgrade would reduce

truck activity through Caledon East, maintain cycling connection and farm equipment operation, and limit property, natural environment, and heritage impacts.

Region of Peel Class EA Study for Airport Road from Mayfield Road to King Street (2015)

The Region completed a Municipal Class EA Study in 2015 for improvements to Airport Road from 1.0km north of Mayfield Road to 0.6km north of King Street in Caledon. For this section of Airport Road, the study recommended:

- A 5-lane cross section including a continuous centre left-turn lane and intersection improvements to provide improved levels of service,
- Improvements to safety and congestion through roundabouts at the Old School Road-Healey Road and King Street intersections on Airport Road, and
- Active transportation with paved shoulders in rural areas.

3.1.3 Municipal Planning and Policy Context

Town of Caledon Official Plan (2016 Consolidation)

The Town of Caledon Official Plan (2016) outlines the principles, policies, objectives, and goals that guide future land use, including the social, economic, and natural environment within Caledon. The Official Plan identifies Airport Road as a high capacity arterial road and a commercial focus of the local community. The Official Plan also identifies needs and opportunities for active transportation (Section 5.9.3.4) "to support the planning and development of pedestrian and bicycle facilities and their linkages with open space areas".

Schedule A of the Town of Caledon's Official Plan shows the land use designations within the Study Area. The land uses are also shown and described in Section 4.3 of this ESR.

The Town of Caledon began the process of updating their Official Plan in 2019.

Caledon East Secondary Plan (2018 Consolidation)

The Caledon East Secondary Plan forms part of the Town of Caledon Official Plan and provides a detailed framework for guiding the Caledon East community to 2031. Within the Plan, Caledon East is identified as a Rural Service Centre that serves as a primary growth area and as an administrative centre for the Town of Caledon. At the furthest extent, Caledon East is generally bounded by Mountainview Road to the west, Huntsmill Drive to the north, beyond Innis Lake Road to the east, and south of Cranston Drive. Mono Road to the south was identified as a separate community or hamlet.

The Caledon East Secondary Plan identifies Airport Road as a High Capacity Arterial and Old Church Road as a Medium Capacity Arterial. Both roads accommodate regional and inter-regional traffic and intersect

in Caledon East. These roads have been identified as having an important role in defining Caledon East's small town character and community life. The Plan also shows a conceptual pedestrian network for Caledon East that includes the Caledon Trailway crossing Airport Road, and conceptual pedestrian linkages crossing Airport Road south of Cranston Drive, at the Caledon East Public School exit, at Leamster Trail, and at Huntsmill Drive.

Section 7.7.15 of the Secondary Plan outlines transportation policies. The following policies were noted for the Airport Road Study corridor:

7.7.15.6 "The Town shall endeavour to improve on-street parking within the commercial core of Caledon East, and to provide additional on-street parking or communal parking areas, as opportunities arise, to serve both the commercial core and the Caledon Trailway."

7.7.15.7 "The Town shall explore opportunities to implement traffic calming measures along Old Church Road and Walker Road West to enhance pedestrian and vehicular safety, where such measures will not unduly impede the efficient flow of traffic or adversely affect emergency access."

7.7.15.8 "The Town shall explore opportunities to establish community "gateway" features at the north, south and east ends of Caledon East … in co-operation with developers, residents and local service groups."

Town of Caledon (Caledon East) Community Improvement Plan (2014)

The Caledon East Community Improvement Plan is a strategy to revitalize and improve Caledon East and to improve the quality of life of residents. It outlines programs and tools to encourage the improvement of private property and public areas, addressing matters such as beautification, accessibility, active modes of transportation, sustainability, community design and economic development. This Class EA Study supports the Caledon East Community Improvement Plan by considering enhanced pedestrian crossings and streetscaping in the Airport Road corridor.

Development Plans

At the time of preparing this report, development plans within or near the Study Area were at various stages of review and approval. Notwithstanding, potential future developments within or near the Study Area are expected to increase traffic volumes on Airport Road. The traffic studies for the following development sites were reviewed to assist with development of future traffic growth:

5992 King Street. This development site is located at the northwest quadrant of Airport Road and King Street in the Sandhill Settlement Area. The property is planned to include eight fuelling stations, a convenience store, and a fast food restaurant with a drive through window.

15717 Airport Road. This development site is nearly 500m north of the Airport Road and Olde Base Line Road intersection at the southeast quadrant of Airport Road and the Foodland Plaza in Caledon. Some 606 townhouse units and 42 senior house units are proposed. The full build is proposed to be in 2022.

16114 Airport Road. This development site is at the northwest quadrant of Airport Road and Walker Road in Caledon. Thirty-eight (38) condominium townhouse units with two commercial buildings are proposed. Full build was proposed to be in 2019.

89 Walker Road West. This development site is located at the northeast corner of Walker Road West and Mountainview Road in Caledon. Some 203 residential units are proposed to be included here with proposed build out by 2022.

Other potential future developments that may affect the Study Area include a small residential development east of Airport Road connecting to McKee Drive.

3.2 Transportation Conditions

A transportation study was completed by IBI to investigate existing and future traffic conditions and traffic safety in the Study Area. The study investigated short and long-term transportation needs, which informed the development and evaluation of alternative planning and design solutions.

This section summarizes the findings of the transportation study. Additional details can be found in the **Transportation Study Report** in Appendix B. The development and evaluation of alternative planning and design solutions are summarized in Sections 6 and 7 of this ESR.

3.2.1 Existing Road Network

The Study Area corridor is approximately 7.5km in length, from 100m north of King Street to 300m north of Huntsmill Drive. Within the Study limits, Airport Road has a two-lane cross-section and extends through the communities of Mono Road and Caledon East.

The existing and designated mid-block right-of-way requirements vary as follows:

Airport Road Segment	Existing Right-of-Way	Designated Right-of-Way
North of King Street to Olde Base Line Road	20-33m	45m
Olde Base Line Road to Cranston Drive	20-33m	45m
Cranston Drive to South of Hilltop Drive	20-33m	45m
South of Hilltop Drive to Caledon Trailway	20m	20m

Airport Road Segment	Existing Right-of-Way	Designated Right-of-Way
Caledon Trailway to Walker Road	20-33m	26m
Walker Road to Leamster Trail	20-33m	36m
Leamster Trail to Huntsmill Drive	20-33m	36m

Although the corridor is protected for a range of right-of-way widths, the existing right-of-way introduces significant constraints through the Mono Road and Caledon East communities, where many structures (such as buildings, retaining walls and utilities) are installed at, or close to, the existing property line.

Generally, granular shoulders are provided on both sides of Airport Road between north of King Street to south of the Foodland plaza in Caledon East (with some exceptions through the Mono Road community and north of the School exit on the west side).

The following roads intersect with Airport Road within or near the Study Area:

King Street, beyond the southern limit of the Study Area, is an east-west arterial Regional road that forms a signalized four-legged intersection with Airport Road. The posted speed on King Street at Airport Road is 70km per hour (km/h). The 2015 Region of Peel Class EA Study for Airport Road from 1.0km north of Mayfield Road to 0.6km north of King Street recommended a two-lane roundabout at this intersection.

Castlederg Side Road and **Boston Mills Road** are two east-west rural Town of Caledon roads with an offset stop-controlled intersection configuration (Castlederg Side Road and Boston Mills Road are stop controlled). The posted speed on each road is 60km/h and both roads are truck prohibited.

Olde Base Line Road is a two-lane east-west arterial Regional road that terminates at Airport Road, forming the west leg of the signalized intersection. Olde Base Line Road has a posted speed of 50km/h at Airport Road and 80km/h beyond 350m of the intersection. The road is also parking and truck prohibited.

Cranston Drive is a two-lane east-west Town of Caledon road and intersects Airport Road at a stop-controlled “T” intersection (Cranston Drive is stop-controlled). The posted speed on Cranston Drive is 40km/h. There are northbound left and southbound right-turn lanes on Airport Road at Cranston Drive.

Caledon East Public School access to Airport Road is located approximately 300m north of Cranston Drive on the west side of Airport Road. The existing school access serves only as an egress, with traffic able to turn left and right onto Airport Road. The driveway has no designated pedestrian infrastructure or sidewalks.

A commercial (Foodland plaza) entrance is located approximately 370m north of Cranston Drive on the east side of Airport Road. The entrance forms a two-lane east-west access to the plaza and is served by a southbound left turn lane on Airport Road.

Hilltop Drive, Marion Street, Larry Street, Mountcrest Road, Emma Street, and Parsons Avenue are all two-lane east-west local roads terminating at stop-controlled "T" intersections (all side roads are stop-controlled). Hilltop Drive, Marion Street, Larry Street, Emma Street, and Parsons Avenue join Airport Road on the west side and Mountcrest Road joins Airport Road on the east side. These roads serve local residential areas with a posted speed of 40km/h. On Airport Road, there is a northbound left-turn lane at Hilltop Drive and a northbound right-turn lane at Mountcrest Road.

The **Caledon Trailway** crosses Airport Road at a signalized crossride approximately 40m north of Mountcrest Road. The total distance of the Trailway is approximately 35km. The Trailway can be used for jogging, walking, cycling, horseback riding and cross-country skiing. The Trailway is not maintained through the winter season.

Old Church Road is a two-lane east-west arterial Regional road with a posted speed of 50km/h. At the intersection with Airport Road, the west side of Old Church Road has a private driveway to a commercial (LCBO) property. The driveway operates as a stop control and the other three legs of the intersection are signalized. At this intersection, there is a northbound right-turn lane on Airport Road and a westbound left-turn lane on Old Church Road.

Walker Road is a two-lane east-west local road with a posted speed of 40km/h and is truck prohibited. Walker Road is stop-controlled.

Leamster Trail is a two-lane east-west local road serving a local residential area on the west side of Airport Road. Leamster Trail is stop-controlled. There is a northbound left-turn lane on Airport Road at Leamster Trail.

Huntsmill Drive is near the northern Study limit and is a two-lane east-west local road. This road serves four residences on the east side of Airport Road and has a posted speed of 50km/h. Huntsmill Drive is stop-controlled.

3.2.2 Existing Traffic Conditions

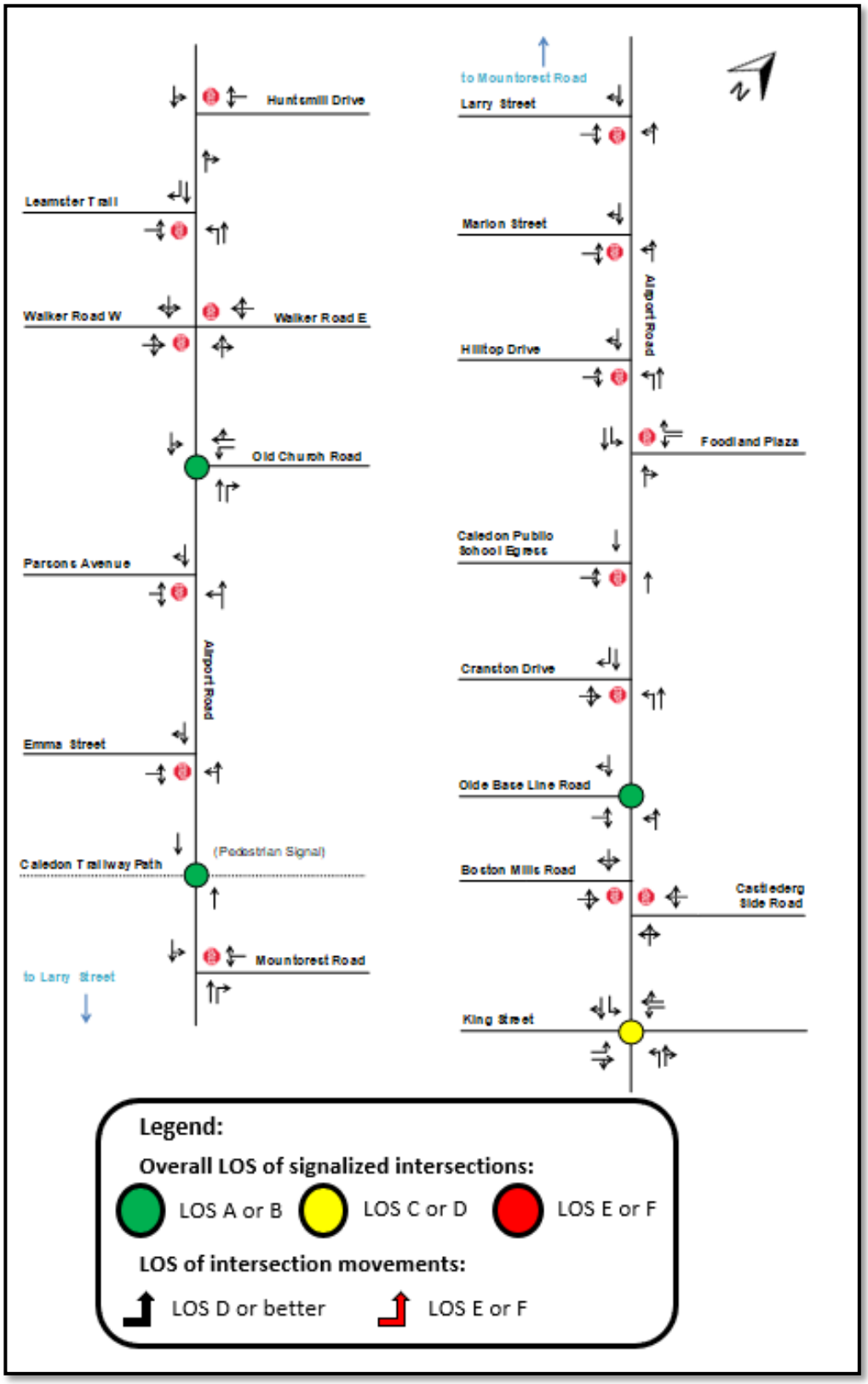
A traffic analysis was conducted for weekday a.m. and p.m. peak hour conditions. A summary of the existing conditions or level of service (LOS) is provided in Table 2. LOS is a measure of performance based on average delay at each intersection, where LOS 'A' means drivers experience little or no delay and LOS 'E' or 'F' signifies long delays, which can be in excess of 1 minute.

Table 2: Existing Level of Service (2017)

Signalized Intersection	Overall Intersection LOS	
	A.M. peak	P.M. peak
King Street	C	C
Olde Base Line Road	B	B
Old Church Road	B	A

Generally, Airport Road currently operates well with acceptable levels of service. The westbound through / right movement at King Street is the only critical movement, with a LOS E in the a.m. peak. With this critical movement, Table 2 shows an overall acceptable LOS C in the a.m. peak for that intersection. The intersections operate at a satisfactory level of service, generally under capacity with very few critical movements. Figure 3 shows the existing levels of service during the p.m. peak.

Figure 3: Existing Level of Service (2017 P.M. Peak Hour)



While existing traffic operations are generally acceptable along Airport Road, two issues were identified: speeding and potential safety issues at the commercial (Glen Echo Nurseries) access north of Boston Mills Road (discussed below).

Speeding

Field traffic speed counts collected by the Region in 2015 identified that speeding was occurring at three locations:

1. 2.8km north of King Street,
2. 0.8km north of Olde Base Line Road, and
3. 1.5km north of Old Church Road.

Safety at Glen Echo Nurseries

There is public perception that the entrance to Glen Echo Nurseries, located approximately 220m north of Boston Mills Road, is unsafe. The site traffic was modelled in Synchro to determine potential traffic and safety issues. The analysis found that the entrance operates well at LOS C or better. There were no significant delays observed for the minor approach. Results are provided in Table 3.

Table 3: Existing Condition Summary for the Local Nursery Site Entrance

Location	Peak Hour	Movement	LOS	Delay (s)
Glen Echo Nurseries Entrance	A.M.	EB	B	15
	P.M.	EB	B	15

EB – Eastbound

A left-turn lane warrant was run for the northbound approach based on the Institute of Transportation Engineers (ITE) Guidelines for Left-turn Lanes. The results found that a left-turn lane is not warranted for the northbound in the a.m. peak but is warranted in the p.m. peak (see Table 4).

Table 4: Left-Turn Lane Warrant for Airport Road Northbound at Local Nursery Site Entrance

Approach	Left-turn %	Opposing Traffic Volume	Advancing Traffic Volume Threshold	Advancing Traffic Volume	Warranted
Northbound left (AM)	5.8%	659	175 (for 6%, 650 vph)	172	NO
Northbound left (PM)	4.2%	301	371 (for 4%, 300 vph)	683	YES

vph – vehicles per hour

3.2.3 Future Traffic Conditions

To determine the future need for improvements and lane requirements, travel demand forecasts were created for the review of 2021, 2031, and 2041 horizon years.

Several developments are expected within the Study Area (Sandhill and Caledon East) in the horizon of the EA traffic study. They will contribute significant traffic volumes to the Airport Road corridor. Area development traffic studies were reviewed to assist with development of future traffic growth. Details on the developments are included in Appendix B. The location of the developments are as follows:

- 5992 King Street
- 15717 Airport Road
- 16114 Airport Road
- 89 Walker Road West

Background growth was estimated using the Region's travel demand model and added to the potential future traffic generated from the developments identified above. Directional growth rates were used, with 1.5% (rounded from 1.39%) used to represent the growth rate for vehicles going northbound in the a.m. peak hour and southbound in the p.m. peak hour. Meanwhile, 1.75% (rounded from 1.51%) represents the growth rate for vehicles going southbound in the a.m. peak hour and northbound in the p.m. peak hour. These directional growth rates were applied to predict traffic volumes in the future horizon years.

2021 Future Traffic

The 2021 horizon year represents a 'do nothing' scenario, meaning no infrastructure changes are assumed for the analysis. The LOS and critical movements for the 2021 horizon year were determined for all signalized intersections within the Study Area assuming current geometric configurations with proposed accesses to potential future developments. Table 5 summarizes the results for the signalized intersections within the Study Area.

Table 5: Signalized Intersection Operations - Do Nothing (2021)

Signalized Intersection	Overall Intersection LOS	
	A.M. peak	P.M. peak
King Street	D	C
Olde Base Line Road	B	C
Old Church Road	B	B

Overall, the signalized intersections within the Study Area will operate at acceptable level of service under future 2021 conditions. All of the intersections will operate under capacity with very few critical movements.

2031 Future Traffic

The 2031 horizon year represents a 'do nothing' scenario, meaning no infrastructure changes are assumed for the analysis. The LOS and critical movements for the 2031 horizon year were determined for all signalized intersections within the Study Area assuming current geometric configurations with proposed accesses to potential future developments. Table 6 summarizes the results for the signalized intersections within the Study Area.

Table 6: Signalized Intersection Operations - Do Nothing (2031)

Signalized Intersection	Overall Intersection LOS	
	A.M. peak	P.M. peak
King Street	D	C
Olde Base Line Road	B	D
Caledon East Public School Driveway (subject to area development review and approval)	A	A
Old Church Road	B	B

Most intersections within the Study Area operate at acceptable level of service under future 2031 conditions. There are a few critical movements identified as follows:

Airport Road and King Street has the westbound approach operating at LOS F and v/c ratio greater than 1.0, thus improvements identified in the separate Class EA for Airport Road from Mayfield Road to King Street should be implemented by 2031.

Airport Road and Olde Base Line Road – the eastbound approach, with a single entry lane for both left and right-turning traffic, operates at LOS D. Traffic operations could be improved by separating left and right-turning traffic, however there is limited room in the current right-of-way.

Airport Road and Foodland Plaza – in the p.m. peak hour the westbound left-turn operates at LOS F with delay of 76 seconds. While delay is getting long, the acceptable v/c ratio indicates that this intersection still has residual capacity. Improvements may be considered at or around 2031.

Airport Road and Emma Street – the eastbound approach operates at LOS F with long delays in the p.m. peak hour. Constrained operations are reflecting lack of gaps in traffic along Airport Road.

Additional commentary on potential improvements is provided in the 2041 analysis.

2041 Future Traffic

Two scenarios were completed for the 2041 horizon year: a 'do nothing' scenario and an infrastructure improvements scenario.

2041 – Do Nothing

For the 2041 do nothing scenario, the LOS and critical movements were determined for all signalized intersections within the Study Area assuming current geometric configurations with proposed accesses to potential future developments. Table 7 summarizes the results for the signalized intersections within the Study Area.

Table 7: Intersection Operations - Do Nothing (2041)

Signalized Intersection	Intersection LOS	
	A.M. peak	P.M. peak
King Street	E	D
Olde Base Line Road	C	E
Caledon East Public School Driveway (subject to area development review and approval)	A	A
Old Church Road	C	B

By year 2041, there are a number of intersections or movements with poor traffic operations:

- Unsignalized side-street access to Airport Road becomes difficult with long delays as drivers wait for a gap in traffic to enter. This constraint in traffic operations applies to most local streets accessing Airport Road throughout the Study corridor, and to business or private driveway access.
- Signalized intersections at King Street and Olde Base Line Road have movements with long delays and queues under their current geometry, despite optimized signal timings.

Broadly, the findings point to a need for a package of intersection improvements and potential access consolidation and re-configuration. For unsignalized side-street access to Airport Road, alternative routes for traffic to enter Airport Road via a signalized intersection should be sought. For segments with frequent driveways (e.g. Mono Road, parts of Caledon East), additional turning lanes or a two-way left-turn lane should be considered.

2041 – With Infrastructure Improvements

For discussion of traffic mitigation, the corridor has been split into four planning segments based on adjacent land use and natural or urban boundaries:

King Street to Cranston Drive (5.0km)

Olde Base Line Road and Airport Road: The Caledon East Feasiblity Study completed in 2015 recommended that dedicated northbound left-, southbound right-, and eastbound right-turn lanes be provided, and this configuration was tested for anticipated 2041 traffic volumes.

The Caledon East Study also recommended consideration for a bypass of the community of Mono Road, potentially consisting of realignment of Olde Base Line Road to connect to Airport Road to encourage trucks to turn onto Olde Base Line Road towards Highway 10 rather than continue north through Mono Road and Caledon East. Since the traffic operations analysis indicates that sufficient capacity for traffic can be provided at the intersection through local improvements, the bypass is not 'triggered' by traffic operations under the current Class EA.

Castlederg Side Road-Boston Mills Road and Airport Road: This intersection was identified as a safety concern due to the offset between the east and west legs. The study explored realignment of either east or west leg to a standard four-legged intersection with dedicated left-turn and right-turn lanes for eastbound and westbound approaches. A signal warrant and left-turn warrant was run for all legs of the intersection. The results showed that a signal is not warranted, but both northbound and southbound left-turn lanes will be warranted during both peak periods for year 2041. A roundabout was also considered and carried forward per further assessment in the Roundabout Screening section below.

Cranston Drive to Caledon Trailway (0.9km)

Cranston Drive / Potential South Access at 15717 Airport Road Development Site: Mitigation options tested at this intersection include: flaring side-street approaches to provide separate left and right-turn lanes, roundabout, and signalization. The analysis found that the signal / roundabout warrant will be met later in the design horizon near 2041.

Some of the mitigation options described above would be subject to a separate development planning review and approval process. However, development access at this location was considered to be reasonably located based on the Caledon East Secondary Plan. It was also considered reasonable to assume that a second development access to the north would be required for which the configuration and location would be subject to ongoing development review.

Also, since the design complexity for a roundabout is significantly greater than for a traditional intersection, it was important to confirm at the EA stage that the proposed connection to tie into future development is feasible. These options were therefore considered in the traffic study and a roundabout was carried forward per further assessment in the Roundabout Screening section below.

Caledon East Public School Access / Potential North Access at 15717 Airport Road Development Site: Mitigation options tested at this intersection include: unsignalized, pedestrian signalized, and signalized

intersections with separate westbound left and westbound right-turn lanes, and dedicated northbound right and southbound left-turn lanes to the proposed development. The traffic report indicates that signalization is warranted due to pedestrian crossing volume and the school access should be re-constructed to provide a sidewalk.

It was later clarified in the EA that although the Caledon East Secondary Plan supports the concept of a north access, the development plans for 15717 Airport Road and associated traffic recommendations were not yet finalized or approved. The intersection configuration, signalization and sidewalk described above would be subject to a separate development planning review and approval process. As a result, these mitigation options were not carried forward in the EA. Although the location could be considered as a candidate area for a mid-block pedestrian crossing.

Foodland Access: A signal is not warranted at this intersection.

Hilltop Drive and **Marion Street:** No improvements are recommended due to lack of available right-of-way along Airport Road. However, shifting left-turn traffic to a signalized intersection or roundabout at Cranston Drive would provide an egress path for traffic to reduce side street delays.

Larry Street: No improvements are recommended since the Cranston Drive improvements are expected to provide an alternative egress path to traffic on Larry Street.

Mountcrest Road: A left-turn lane is warranted for the southbound approach in the p.m. peak hour only, but due to the lack of available right-of-way, this option was not carried forward.

Caledon Trailway to Walker Road (0.5km)

The west leg of the Old Church Road and Airport Road intersection, which is the unsignalized driveway to the LCBO, is a concern due to poor traffic operations, lack of sightlines, collision risk, unclear priority rules, and undesirable configuration of a driveway within a major intersection. Comments received from the public had also expressed concerns about the safety of this intersection.

The following alternative solutions were developed in the traffic study:

1. **Convert west driveway to right-in, right-out**

   This was considered in the traffic report as not likely to be feasible or successful as the driveway is located within the intersection and would be subject to violators and further safety deterioration. However, this technical option was carried forward as an alternative to be further assessed in the EA.

2. **Implement split signal phasing**

   This was considered not preferable from a traffic operations and safety perspective, as it would present drivers with a green signal that phases in one direction at a time, potentially increasing

traffic and pedestrian wait times. However, this technical option was carried forward as an alternative to be further assessed in the EA.

3. **Close the access requiring property access from the rear via Ivan Avenue**

   This alternative was considered not likely acceptable to current property owners and tenants and may require acquisition of the property. However, this technical option was carried forward as an alternative to be further assessed in the EA.

4. **Removal of LCBO building and extension of Old Church Road to Ivan Avenue** (see Figure 4).

   This option required further study to determine potential traffic impacts to the neighbourhood west of the LCBO property. This technical option was carried forward as an alternative to be further assessed in the EA.

Due to the complexity of some of the above options, these alternatives required consultation with the Town of Caledon and property owners. The alternatives also had to be evaluated to determine potential environmental, cultural, social, and economic impacts. Full details on the EA evaluation and additional alternatives considered are included in Section 7 of this ESR. The traffic impacts and analysis are discussed below.

Figure 4: Conceptual Alignment of Old Church Road Extension in Traffic Study

For the Old Church Road extension option, the potential for additional shortcutting traffic was assessed via a desktop travel time analysis (see Table 8). Shortcutting in this context would refer to background traffic (e.g. traffic along Mountainview Road and Walker Road west of Oliver's Lane) using Ivan Avenue and the Old Church Road extension. Traffic currently using Ivan Avenue, Parsons Avenue, and

improperly using the LCBO parking lot as a shortcut to Airport Road were not considered shortcutting traffic.

Table 8: Old Church Road Extension Origin-Destination Travel Time Analysis

From (Origin)	To (Destination)	Travel Time (by car route)	Potential for Shortcutting via Old Church Extension
Airport Road (near Foodland)	Walker Road west of Oliver's Lane	2 minutes (via Airport Road and Walker Road)	Low
		3 minutes (via Airport Road, Parsons Avenue, and Ivan Avenue)	
		3 minutes (via Airport Road, **Old Church Road Extension**, Ivan Avenue, Oliver's Lane)	
Old Church Road (near Community Complex)	Walker Road west of Oliver's Lane	2 minutes (via Old Church Road, Airport Road and Walker Road)	Low
		3 minutes (via Old Church Road, Marilyn Street, and Walker Road)	
		3 minutes (via Old Church Road, **Old Church Road extension**, Ivan Avenue, Oliver's Lane)	
30 Oliver's Lane	Airport Road (near Foodland)	3 minutes (via Ivan Avenue, Parsons Avenue, Airport Road)	Low
		4 minutes (via Oliver's Lane, Walker Road, Airport Road)	
		3 minutes (via Ivan Avenue, **Old Church Road extension**, Airport Road)	

Based on the above analysis, the Old Church Road extension does not provide a significant travel time savings for traffic between Airport Road and Walker Road west of Oliver's Lane. Therefore, the likelihood of significant shortcutting traffic is low. Most traffic is expected to continue to use Airport Road and Walker Road, and the signal and road extension primarily serve to provide an access to the immediate neighbourhood that is currently using Parsons Avenue to access Airport Road, or using the private driveway at the LCBO.

In response to concerns raised by the public and Town of Caledon, IBI further investigated whether the Old Church Road extension could encourage cut through traffic on Ivan Avenue and through the west neighbourhood. The updated analysis considered the potential for developments at the northwest corner of the Airport Road and Old Church Road intersection. The findings are summarized below and additional details can be found in the Memorandum regarding the Old Church Road Extension Traffic Update in Appendix B.

The extension of Old Church Road was expected to operate well with the forecasted conditions under the preliminary preferred design that was developed at the time of the Update. The Old Church Road and Airport Road intersection was shown to be able to handle local traffic volumes, including volumes generated by potential developments. However, it was recommended to add a dedicated right-turn lane or a right-turn pocket lane at the eastbound approach of Walkers Road at Airport Road to reduce the right-turn delay and likelihood of cut through traffic on Ivan Avenue. It was further determined that the current pavement lane width configuration could remain as is to accommodate both eastbound left- and right-turns. The Region would consider delineating eastbound turn lanes if traffic at this location increases in the future.

As noted above, further evaluation of alternatives at Airport Road and Old Church Road is provided in Section 7 of this ESR.

Walker Road to Huntsmill Drive (0.8km)

In 2041, the Leamster Trail and Huntsmill Drive intersections continue to operate well, and no changes are recommended for traffic operations purposes.

At Airport Road and Walker Road, a signal warrant and a left-turn lane warrant was run for all approaches of the intersection. The results showed that a signal is not warranted in 2041, but the northbound left volumes warrant a left-turn lane based on both a.m. and p.m. peak hours and a southbound left-turn lane will be warranted based on p.m. peak hour volumes only.

While traffic operations are acceptable under the two-way stop control configuration, traffic speeds have been identified as a concern. A southbound right-turn lane on Airport Road was considered and initially proposed in the EA as it may provide a safety benefit to southbound traffic. Following consultation with the Town of Caledon, the southbound right-turn lane was removed from the EA to enhance the safety benefit from the perspective of reducing the crossing distance for pedestrians and potentially encouraging slower speeds approaching the right-turn movement.

Traffic calming via urbanization and a gateway feature was explored further during the development of alternative design concepts.

3.2.4 Collision History

Within the Study limits, there were 91 reported collisions during the 2012-2016 period, with 74 categorized as property damage only, 16 categorized as non-fatal injuries, and one was a fatality. Overall, there were 26 collisions in 2012, 21 collisions in 2013, 25 collisions in 2014, seven collisions in 2015 and 12 collisions in 2016. The transportation study notes that the fall in annual collision frequencies may be due to a change in the collision reporting system from a paper-based system to an electronic reporting system and the decrease in collision numbers may be a result of migrating to the new electronic system.

Of the 91 collisions, 50 occurred at intersections and 41 at midblock locations. King Street, Olde Base Line Road, and Old Church Road intersections have the highest number of collisions, and the midblock locations adjacent to these same intersections also have a high number of collisions, both likely due to high traffic volumes passing through these locations.

Seventy-four percent (74%) of rear-end collisions occurred at signalized intersections during high traffic demand periods, such as the morning and afternoon commuter peak times. Single motor vehicle collisions were noted at King Street and Hilltop Drive. Nearly half of the midblock single motor vehicle collisions involved striking wildlife, two collisions involved a pedestrian, and the remainder involved drivers losing control and driving into a ditch or pole.

3.2.5 Roundabout Screening

Roundabout Analysis

Region of Peel policy states that roundabouts should be explored at intersections where signals or other improvements are under consideration. Roundabouts provide a number of benefits over signalized intersections including reduced delays during off-peak times, reduction in fatal and serious injury collisions, encouraging lower traffic speeds, and lower maintenance costs.

Building on the prior analysis, five potential roundabout locations were analyzed using forecasted 2041 traffic volumes. Roundabouts were analyzed using ARCADY per Regional guidelines. In addition, a Network Capacity Scaling factor of 90% (10% reduction in roundabout capacity) was added to the ARCADY analysis to reflect lesser North American experience with roundabouts. The ARCADY results are summarized below and details are included in Appendix B.

Airport Road at Castlederg Side Road-Boston Mills Road

Initially, a single-lane entry roundabout at this location was not expected to operate well during either the a.m. or p.m. peak period. The addition of a northbound right-turn by-pass lane and converting the southbound approach to a flared two-lane entry were considered. This configuration was expected to be effective at relieving congestion on the southbound approach during the a.m. peak period, and improving operations on the northbound approach during the p.m. peak period. To improve northbound operations even further, the approach could be converted to a flared two-lane entry.

The single-lane entry roundabout configuration was further examined as part of the **Roundabout Traffic & Safety Assessment and Functional Design Review** in Appendix B. Based on 2021 and 2031 traffic volumes, the updated ARCADY analysis indicated the single-lane entry roundabout is expected to operate well during both the a.m. and p.m. periods. Based on 2041 traffic volumes, the analysis indicated moderate delays and queuing for the southbound approach in the a.m. and northbound approach in the p.m. The two most critical movements are expected to operate under capacity, and therefore the single-lane configuration was concluded to work well to 2041. This intersection is rural and pedestrian and cycling volumes are likely to be low.

Implementing a roundabout at this intersection would facilitate lower traffic speeds. By facilitating lower traffic speeds, the roundabout may also result in truck diversions away from the communities of Mono Road and Caledon East. Also, with the speed reduction from roundabouts, northbound and southbound vehicles will allow safer gaps for egressing and accessing vehicles of the nursery approximately 220m north of the intersection, where there have been complaints about traffic and safety issues.

The roundabout can potentially be a transition point for vehicles going northbound along Airport Road into the rural community of Mono Road. It was noted that this intersection currently lies approximately 550m south of the community, which is far enough for drivers to resume speeding. Subject to the preferred design, the Region will further explore traffic calming measures through this section of the corridor with the Town of Caledon.

Realignment to a four-legged intersection was initially recommended with property protection considered for a future long-term roundabout. The latter in combination with the potential benefits described above provided the rationale to carry the roundabout concept forward to the Roundabout Feasibility screening described below and ultimately to the evaluation of alternatives in Section 7 of this ESR.

Airport Road at Olde Base Line Road

A single-lane entry roundabout at this location is not expected to operate well, with the northbound approach experiencing significant capacity constraints at LOS F during the p.m. peak period. A flared two-lane entry roundabout is expected to be an effective treatment for the intersection, however there are adjacent properties that will be impacted. Therefore, further development and costing of the roundabout option was required.

The roundabout configuration was further examined under the **Roundabout Traffic & Safety Assessment and Functional Design Review** in Appendix B. The Assessment generally supported the roundabout concept at this intersection and noted the potential benefits of lower traffic speeds for midblock sections of the corridor, truck diversions away from the community of Mono Road and Caledon East, and a clear transition point to Mono Road immediately south of the intersection.

The roundabout concept at Olde Base Line Road has significant impacts to property, including homes and businesses. An at-grade intersection operates well at this location, and so the roundabout may be considered too costly and too impactful on the community. Property impacts at this location were factored into the Roundabout Feasibility screening described below and the evaluation of alternatives in Section 7 of this ESR.

Airport Road at Cranston Drive

A single-lane entry roundabout at this location is not expected to operate well, with both the southbound and northbound approaches experiencing significant capacity constraints during the a.m. and p.m. peak periods, respectively. A flared two-lane entry roundabout is expected to operate well with all approaches operating at LOS A, and some residual network capacity during both the a.m. and p.m. peak periods.

The flared two-lane entry roundabout configuration was further examined and confirmed as part of the **Roundabout Traffic & Safety Assessment and Functional Design Review** in Appendix B. The Assessment added that a roundabout is not supported by the cost analysis, but may provide the benefit of encouraging lower traffic speeds through the community of Caledon East. This is particularly important due to the speeding concerns south of the intersection and the Caledon East Public School located 300m north of Cranston Drive, as well as the potential for significant development on the east side of Airport Road. By facilitating lower traffic speeds, the roundabout is likely to result in truck diversion away from the community of Mono Road and Caledon East. It was noted that there is potential for pedestrians crossing Airport Road at the roundabout between the proposed development on the east side and Cranston Drive on the west. The proposed roundabout would include crosswalks to be examined further in detailed design. Given the above factors, the Region pursued the roundabout under further review and consultation in the EA.

Airport Road at Walker Road

A single-lane entry roundabout at this location is expected to operate well, with residual capacity during both the a.m. and p.m. peak periods. This option was further assessed in the Roundabout Feasibility screening below and in the evaluation of alternatives in Section 7 of this ESR.

Airport Road at Huntsmill Drive

A single-lane entry roundabout at this location is expected to operate well, with significant residual capacity during both the a.m. and p.m. peak periods. This option was further assessed in the Roundabout Feasibility screening below and in the evaluation of alternatives in Section 7 of this ESR.

Roundabout Feasibility

The above potential roundabout locations were carried forward for further evaluation in the Region of Peel's Roundabout Feasibility Screening Tool. The Screening Tool is a planning-level tool used to determine if a subject intersection warrants more detailed analysis for the installation of a roundabout. It takes into consideration the existing traffic volumes, operational concerns, existing traffic control, proximity to adjacent signals, vertical geometry, and property constraints. Each item is identified as roundabout supportive, non-supportive or neutral, and an overall recommendation is provided in terms

of proceeding with planning for a roundabout. Table 9 summarizes the evaluation and Appendix B includes the detailed screening tool.

Table 9: Roundabout Screening Summary Table

Intersection Road (with Airport Road)	Roundabout Supportive (Score / 14)			Recommendation
	Yes	No	Neutral	
Castlederg Side Road-Boston Mills Road	3	5	6	Yes
Cranston Drive	1	7	6	Yes
Olde Base Line Road	5	3	6	No
Walker Road	2	6	6	No
Huntsmill Drive	1	6	7	No

Based on the ARCADY and the Region of Peel's Roundabout Feasibility Screening analyses, roundabouts were recommended at Castlederg Side Road-Boston Mills Road and Cranston Drive.

3.2.6 Sustainable Transportation

Active Transportation

Active transportation facilities are limited along Airport Road consisting of only sidewalks along the urbanized sections of the Study Area (from the Caledon East Public School Exit to Walker Road) and a crosswalk facility at the Caledon Trailway.

From north of King Street to Castlederg Side Road-Boston Mills Road, there are no pedestrian or cycling facilities. The 2015 Region of Peel Airport Road Class EA (Mayfield Road to King Street) identified paved shoulders as an active transportation improvement south of the current Study Area.

From Castlederg Side Road-Boston Mills Road to South of Cranston Drive, there are no pedestrian or cycling facilities. However, there are future planned paved shoulders on Castlederg Side Road and intersecting cycling facilities on Olde Base Line Road with existing paved shoulders.

At the Region's Caledon Trailway, the crossing of Airport Road was upgraded in 2011 to include a pedestrian signalized crossing. The Trailway includes a new multi-use bridge crossing, a cyclist rest bar, and a trailhead with mapping facilities. South of the Caledon Trailway, sidewalks exist on both sides of Airport Road, south to the Foodland plaza. South of the Foodland plaza, the east side of Airport Road transitions to a rural cross-section where there are no paved shoulders. The sidewalks continue on the west side of Airport Road to the Caledon East Public School driveway. Airport Road then transitions to a rural cross-section without any pedestrian or cycling facilities.

At the Old Church Road and Airport Road intersection, there are painted ladder crosswalks and no AODA features.

East of the Old Church Road and Airport Road intersection, sidewalks exist on both sides of Old Church Road up to Marilyn Street, with paved boulevards and pedestrian scale lighting. There are no bike lanes in this section of the roadway.

From Walker Road to Huntsmill Drive, there is a pedestrian facility on the west side of Airport Road to Leamster Trail. South of Walker Road, there are narrow sidewalks on both sides of the road, streetscaped boulevards, and pedestrian scale lighting. At some locations the sidewalk paving is uneven. There are no cycling facilities at Walker Road and Airport Road. However, the Town of Caledon recently implemented a signed cycling route on Walker Road.

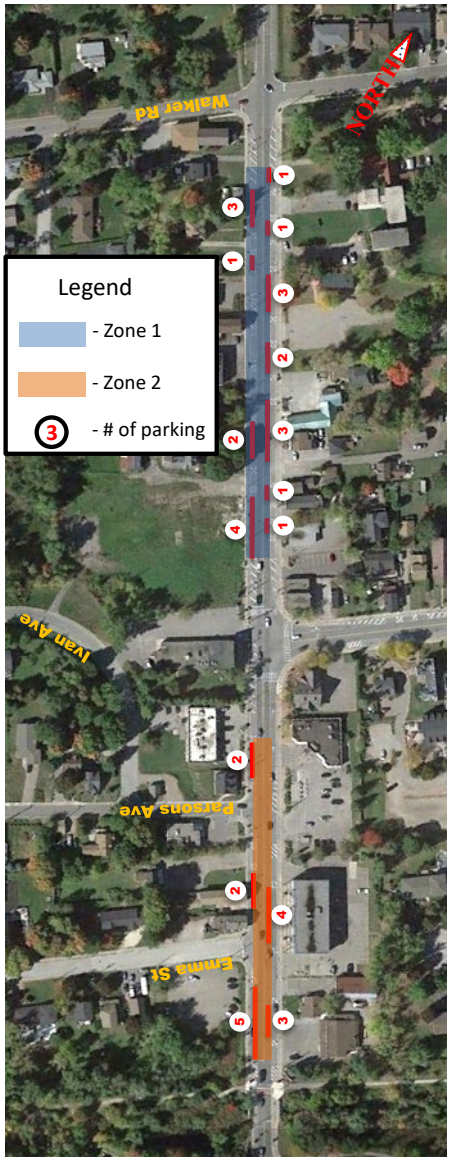
Public Transit

Starting in November 2019, the Town of Caledon retained Voyago to provide local bus service in the Bolton area. The Town of Caledon currently does not provide a public transit system outside of the Bolton area. GO Transit operates two bus routes within Caledon, but the stops are outside the Study Area. A Town of Caledon feasibility study is currently investigating the costs and benefits of providing public transit services within Caledon.

3.2.7 Parking Supply and Demand

On-street parking is available in Caledon East on both sides of Airport Road from the Caledon Trailway to Walker Road. As shown in Figure 5, 38 parking spaces are available on this section of Airport Road with 19 spaces on each side.

Figure 5: On-Street Parking in Caledon East



Trans-Plan conducted an on-street parking study for Airport Road in Caledon East on November 15, 16 and 24, 2018. Subsequently in January, 2019, the Region completed an analysis of the data collected (see Appendix B). IBI reviewed the analysis and summarized the findings as follows:

- On weekdays, on-street parking on the east side is fully used while parking on the west side is regularly used with slight oversupply.
- On weekends, on-street parking on the east and west side is under-used.
- On a net basis, on-street parking is under-used.

Most on-street parking is convenience-based; Mapping indicates off-street business-related parking is present (except one business with no off-street parking and one business with one parking space).

The findings were factored into the evaluation of alternative designs to better understand the potential trade-offs among alternatives and to ensure the outcome meets the needs of the community as well as the objectives of the Study (see Section 7 of this ESR).

3.3 Multi-Modal Transportation Review

3.3.1 Regional and Local Transportation Planning

The 2019 Region of Peel LRTP provides a policy implementation framework for the Regional Official Plan. It addresses transportation challenges anticipated over the next 20 to 30 years, such as congestion due to high population growth, economic competitiveness, and the need for sustainable planning. The LRTP serves as the Transportation Master Plan for the Region. The STS is a component of the LRTP, which outlines the Region's plan in building a sustainable transportation system, sets the goal of 50% of sustainable peak period trips and describes the business case for implementing sustainable transportation. The Town of Caledon provides their own Transportation Master Plan, which builds on the directions of the Town of Caledon Official Plan, the Region of Peel LRTP, and considers a broad range of ongoing initiatives by other government agencies.

3.3.2 Mode Share Targets for Peel and Caledon

Peel's population and employment is forecasted to increase by 46% and 49%, respectively, by 2041 (from the 2011 base year). In response, the Region's STS has set a 50% peak period mode share target for sustainable transportation modes in Peel, applied on a community specific context.

A summary of the modal split in the 2011 base year and mode share targets for the 2041 horizon year is provided in Table 10.

Table 10: Existing Modal Split (2011) & Mode Share Targets for Peel and Caledon (2041)

Mode	Region of Peel		Town of Caledon	
	2011	2041	2011	2041
Driving	62.5%	50.0%	71.0%	64.7%
Walking	6.8%	9.0%	3.5%	3.2%
Cycling	0.3%	2.0%	0.0%	0.7%
Transit	10.8%	17.0%	2.0%	4.8%
Carpool	15.2%	18.0%	8.2%	9.8%
Other	4.3%	4.8%	15.3%	16.8%
Sustainable Transportation	37.5%	50.0%	29.0%	35.3%

3.3.3 Caledon Transportation Master Plan Elements

Town of Caledon Transit Feasibility Study

A transit feasibility study is being led by the Town of Caledon and examines existing and projected demographics and travel patterns within Caledon. A set of potential service options will be developed, evaluated, and prioritized from these existing conditions and from similar municipalities.

Active Transportation

There is an established network of recreational trails which are developed according to the Town of Caledon Trails Master Plan. The Transportation Master Plan recommends that this document continue to be referenced, maintained, and updated at regular intervals. The Transportation Master Plan recommends that sidewalks on at least one side of all local streets and both sides of all new and reconstructed urban collector and arterial roads be provided. In addition, the Transportation Master Plan recommends the completion of a sidewalk strategic plan. Table 5.3 within the Transportation Master Plan summarizes locations where opportunity exists for improvements to the active transportation network. There are currently no cycling facilities provided along Airport Road within the Study Area, but the corridor is accessed by a multi-use trail, a signed bike route (Walker Road) and a roadside trail.

Transportation Demand Management

The Town of Caledon Transportation Master Plan recommends that the Town develop and implement Transportation Demand Management (TDM), beginning with a TDM plan that leverages existing services and implements viable programs.

Land Use

The Town of Caledon Transportation Master Plan recommends the integrated approach of encouraging transit supportive land uses, providing local transit stops, and implementing supportive land use practices.

3.3.4 Airport Road Corridor Mode Share Considerations

Airport Road is a key corridor for the Town of Caledon, and as a result, key considerations exist for the corridor's future mode share targets, which are:

- Variation in population/employment on both ends of trip.
- Enhance and ensure continuity of pedestrian and cycling facilities.
- Reconciling the competing needs of different users on corridors.
- Accommodation to movement of goods.

3.3.5 Airport Road Corridor Mode Share Target

Mode share targets for Airport Road were developed using traffic zone maps. It was noted that Airport Road acts as a boundary between some traffic zones, and thus, targets were taken from zones on either side. In order to account for variation in population, the mode share was scaled according to 2041 projected population density. The mode share targets that were obtained are shown in Table 11.

Table 11: Airport Road Corridor Mode Share Targets

Mode	Airport Road Corridor Split
Driving	66.8%
Walking	10.5%
Cycling	0.1%
Transit	3.1%
Carpool	7.1%
Other	12.4%
Sustainable Transportation	33.2%

These mode share percentages seem reasonable, given that they were computed by weighing population density, where Caledon East accounts for the largest proportion and is a more walkable area when compared to the remainder of the corridor. However, in general, the mode share between walking and cycling seems disproportionate, where cycling should be higher, and walking should be lower. This could be due to cycling paths and trails running perpendicular to the Study corridor and has made cycling an underrepresented mode along Airport Road.

3.3.6 Airport Road Growth Rate Discussion

Growth rates and their rationale are provided in IBI's transportation planning report in Appendix B. A review of relevant studies and policies was first conducted to advise typical growth rates around Peel and Caledon. Various documents show a high population and employment growth rate of 2-3% from years 2011-2031. Historical growth rates and the Region of Peel's EMME model were then used to verify these results. It was reported that southbound volumes were considerably higher in the a.m. peak and lower in the p.m. peak. This behavior is expected and should reflect commuters making their way to work. This methodology led to the use of directional growth rates of 1.5% for the northbound and 1.75% for the southbound (a.m. peak, reverse for p.m. peak) compounded annually. The growth rates used for the traffic study properly account for the population and employment growth. Since the rates used were smaller than the anticipated growth, we anticipate a modal shift from single occupant vehicles to sustainable transportation methods.

3.3.7 Multi-Modal Level of Service Pilot

As a pilot, IBI applied the City of Ottawa methodology for multi-modal level of service (MMLOS) to this EA. The MMLOS measures the performance of the corridor from a cycling and pedestrian perspective.

The methodology was applied to Airport Road from Hilltop Drive to Walker Road for existing conditions only, where the LOS was considered not optimal for cyclists and pedestrians. The MMLOS analysis for existing conditions on Airport Road between Hilltop Drive and Walker Road can be found in Appendix B.

3.4 Problem and Opportunity Statement

The need and justification for the project, as demonstrated by relevant planning documents, transportation analyses and public input, were considered to form the Problem and Opportunity Statement to be addressed through this Class EA:

Airport Road between King Street and Huntsmill Drive is a busy Regional arterial road serving through traffic and goods movement, while also providing access to the communities of Caledon East and Mono Road.

Residents and business owners have expressed concerns with through traffic, heavy trucks, and high traffic speeds in the communities.

Traffic volumes are expected to increase due to growth and local developments. Limited space is available for road widening.

Improvements are required to better accommodate all uses in the corridor such as vehicular traffic, goods movement, walking and cycling, to improve safety and support the local communities.

4. ENVIRONMENTAL CONDITIONS

This section summarizes the environmental planning and policy context for the project, and the existing natural, social, cultural, and economic environmental conditions of the Study Area. The policy context and existing conditions serve as a baseline for the assessment of environmental impacts of alternative solutions and designs.

4.1 Environmental Planning and Policy

The Niagara Escarpment Plan (2020 Consolidation)

The Niagara Escarpment is a topographic feature with a steep slope or long cliff that extends for approximately 725km from Queenston on the Niagara River to Tobermory on the Bruce Peninsula. The Niagara Escarpment is a designated United Nations Educational, Scientific and Cultural Organization (UNESCO) World Biosphere Reserve.

The Niagara Escarpment Plan (NEP) was created under the Niagara Escarpment Planning and Development Act to protect the Niagara Escarpment from significant human impact and ensure a balance between preservation and development of the area. The NEP controls land use planning within the Niagara Escarpment Plan Area, and any new development within the Niagara Escarpment Natural Area is prohibited with exception of the permitted uses and provisions of the NEP.

Based on RiverStone's background review (2019), the Study Area overlaps with the natural heritage system associated with the Niagara Escarpment (see Figure 6). The NEP identifies portions of the Caledon East Wetland Complex (northwest of Huntsmill Drive) within the Escarpment Natural and Escarpment Protection designations. Correspondence from the Niagara Escarpment Commission (2020) indicates that the NEP boundary does not extend as far south as Huntsmill Drive.

Oak Ridges Moraine Conservation Plan (2017)

The Oak Ridges Moraine is one of Ontario's most significant landforms. Through the Oak Ridges Moraine Conservation Act, 2001 and the Oak Ridges Moraine Conservation Plan, the Province has established direction for protecting the Oak Ridges Moraine. Together with the Niagara Escarpment, Lake Ontario, and river valleys, it forms the foundation of southcentral Ontario's natural heritage and greenspace systems.

A significant rural population lives in the Peel and Caledon portion of the Oak Ridges Moraine. Together with the Town of Caledon's Official Plan and Zoning By-law, the intent of the Region's Official Plan is to protect the presence of existing residential uses and encourage minimum impacts on the long-term ecological integrity of the Oak Ridges Moraine.

The western point of the Moraine is located in Caledon, where it intersects with the Niagara Escarpment. It performs ecological functions and has topographical and scenic characteristics. Parts of

Figure 6: Natural Environment Existing Conditions

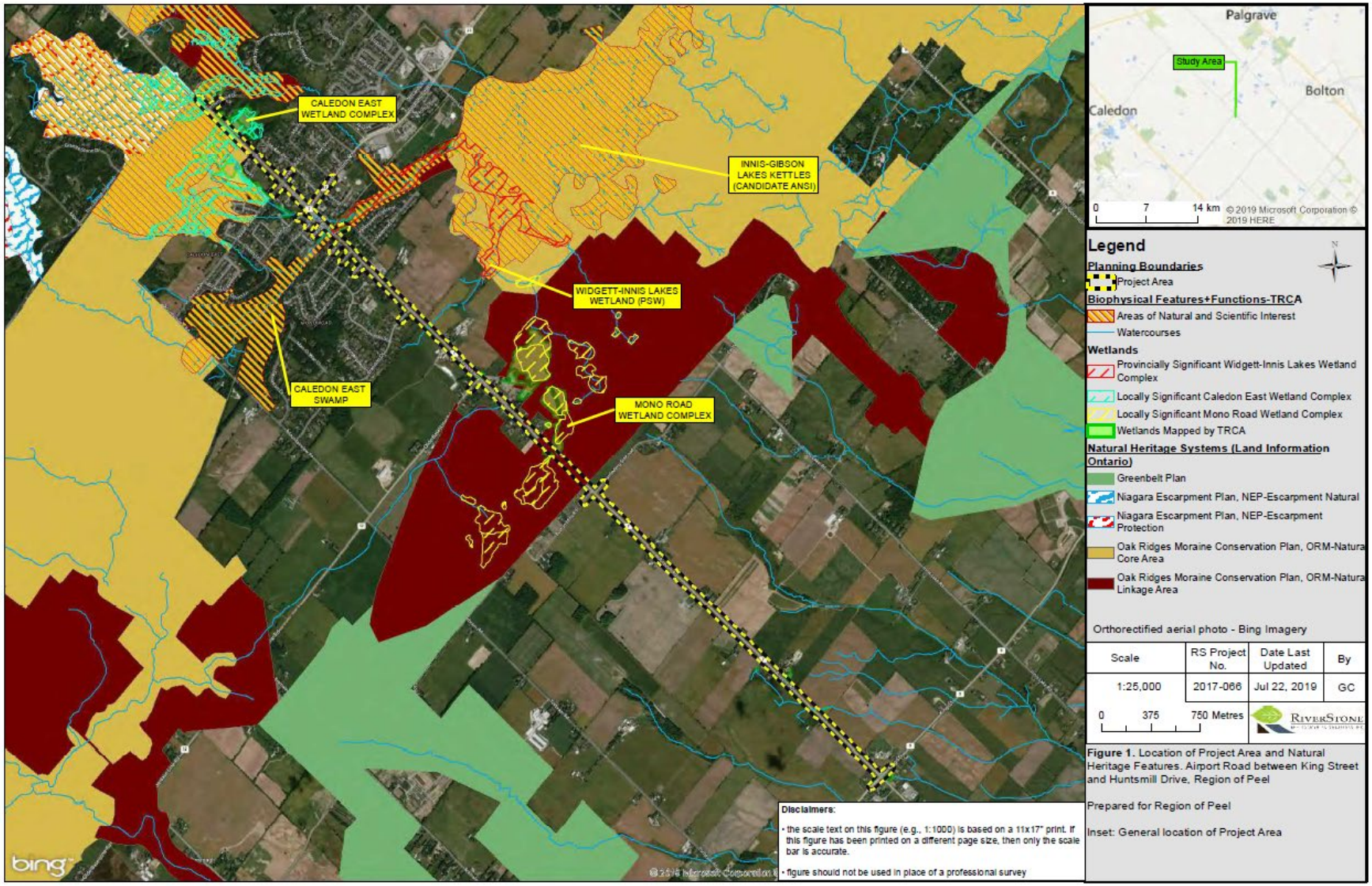


Figure 1. Location of Project Area and Natural Heritage Features. Airport Road between King Street and Huntsmill Drive, Region of Peel

Prepared for Region of Peel

Inset: General location of Project Area

the Airport Road Study Area fall within the Oak Ridges Moraine Conservation Plan Area between Castlederg Side Road-Boston Mills Road and Huntsmill Drive (see Figure 6).

Based on Riverstone's background review (2019), Section 41 of the Oak Ridges Moraine Conservation Plan requires that transportation projects:

- Keep disturbance to a minimum,
- Keep right-of-way widths to a minimum while meeting stormwater management objectives,
- Allow for wildlife movement, and
- Include practices to keep adverse effects to ecological integrity to a minimum.

The Greenbelt Plan (2017)

The Greenbelt Plan provides policy direction for the Greenbelt Area, which encompasses the Niagara Escarpment, Oak Ridges Moraine, and prime farmland from Niagara Falls to Durham Region. Through the Greenbelt Act, 2005 and the accompanying Greenbelt Plan, the Province identifies where urbanization should not occur in order to protect the agricultural lands and the ecological features and functions occurring on this landscape.

The Greenbelt Plan includes the Protected Countryside and lands within the Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan, and Lake Simcoe Protection Plan. It aims to improve ecological linkages between these areas and the surrounding major lake systems and watersheds.

Within the Airport Road Study Area, the Greenbelt Area is consistent with the Oak Ridges Moraine Conservation Plan Area from Castlederg Side Road to Huntsmill Drive (see Figure 6). To be consistent with policies of the Greenbelt Plan, RiverStone recommends:

- Mitigation measures to improve fish habitat,
- Restore or enhance wildlife corridors, and
- Minimize impacts associated with runoff quality into watercourses.

4.2 Natural Environment

The following sections provide a summary of the existing natural environment conditions within the Study Area. More information is available in the **Natural Environment Existing Conditions Report** completed by TRCA (Appendix C), and the **Natural Environment Impact Assessment Report** (Appendix C) and **Tree Inventory and Preservation Plan** (Appendix D) completed by RiverStone.

4.2.1 Environmentally Significant Areas

The Region of Peel Official Plan describes Environmentally Significant Areas as "places where ecosystem functions or features warrant special protection". The Official Plan further explains that Environmentally Significant Areas "are identified by the conservation authorities according to their established criteria".

The Caledon East Complex and Caledon East Swamp Environmentally Significant Areas can be found in the Study Area (see Figure 6). These areas are a hydrologic source of the Humber River and have a variety of vegetation community types, including the Caledon East Wetland Complex north of Walker Road. The Caledon East Swamp projects into the Study Area just north of Larry Street.

4.2.2 Areas of Natural and Scientific Interest

The Region of Peel Official Plan describes Areas of Natural and Scientific Interest (ANSIs) as "areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education". Generally, life science ANSIs represent biodiversity and natural landscapes while earth science ANSIs represent bedrock, fossil, landform features or geological processes. The Official Plan further explains that "ANSIs are evaluated and identified as either provincially or regionally significant by the Ministry of Natural Resources and Forestry".

Only a small portion of the Provincial Innis-Gibson Lakes Kettles Candidate ANSI reaches the Study Area north of Mountcrest Road (see Figure 6). This ANSI is primarily a wetland community, which is part of the Widgett-Innis Wetland Complex, a provincially significant wetland further described below.

4.2.3 Wetlands

The Widgett-Innis Wetland Complex, a provincially significant wetland, can be found in the Study Area (see Figure 6). It is situated on the east side of Airport Road and only a small portion of it that extends along the Centerville Creek overlaps with the Study Area. The small wetland communities of this complex are mainly dominated by reed canary grass.

The Caledon East Wetland Complex and Mono Road Wetland Complex are two locally significant wetlands that overlap the Study Area (see Figure 6). The Caledon East Wetland Complex is located north of Walker Road and is dominated by swamp communities, with small areas of marsh. The swamp communities are dominated by white cedar and various hardwood species such as black ash on mineral soil and organic soils. The Mono Road Wetland Complex within the 100m buffer on both the west and east sides of Airport Road is located nearly 410m north of Castlederg Side Road. On the west side, the wetland is a swamp community dominated by various willow species, and on the east, it is identified as a marsh community dominated by narrow-leaved cattail.

Two small unevaluated wetlands are located north of Larry Street on the west side of Airport Road (see Figure 6). These communities are a variety of thicket swamp dominated by red-osier dogwood dominated by cattail species. Four other small unevaluated shallow marsh wetlands are located to the south of Mountcrest Road on the east side of Airport Road. These wetlands are dominated by narrow-leaved cattail and common reed.

4.2.4 Vegetation

Vegetation community designations were based on Ecological Land Classifications (ELCs) and determined to the level of vegetation type. Fifty-one (51) vegetation communities can be found within the Study Area, ranging from coniferous plantation to shallow marsh and aquatic communities.

The Study Area consists of the following habitat types: forest, successional, wetland, aquatic, dynamic, and meadow. The most prominent vegetation types are: Exotic Cool-season Grass Graminoid Meadow (5.8 hectare (ha)), White Cedar-Hardwood Mineral Mixed Swamp (1.6ha), Narrow-Leaved Cattail Mineral Shallow Marsh (1.0ha), and Fresh-Moist White Cedar Coniferous Forest (1.0ha).

There are eight communities of Regional Conservation Concern and 13 communities of Urban Concern within the Study Area. Communities or species of Regional Concern are regionally scarce. Communities or species of Urban Concern could show decline if urban impacts are not effectively mitigated. The Treed Sand Barren and Dry Drop Seed Sand Barren are two uncommon and dynamic community types within the Study Area.

Flora Surveys

Some 300 plant species were identified in the Study Area in 2016. Two hundred seventy-seven (277) were naturally occurring of which 161 were native. Twenty-three (23) planted species were found comprising of nine native and 14 exotic species. Flora species were greatest throughout the northern half of the Study Area with fewer species observed to the south.

Tree Inventory

Six hundred forty-nine (649) trees and 38 tree species are present within the Study Area. White Cedar was the most abundant tree, with Trembling Aspen, Black Locust, Manitoba Maple, Green Ash, White Birch, and Blue Spruce also making up a large proportion of the trees.

Species at Risk

One Butternut tree, which is protected under the Provincial Endangered Species Act, was identified at 16114 Airport Road.

4.2.5 Wildlife and Wildlife Habitat

Fauna Surveys

TRCA fauna surveys (2017) within the Study Area documented a total of 51 terrestrial vertebrate fauna species, consisting of 42 bird species, three herpetofauna and six mammal species.

Fauna surveys (2017) reported four bird species of Regional Concern: black and white warbler, blue-winged warbler, horned lark, and the winter wren. Fourteen (14) species were of Urban Concern. There were also three herpetofauna and three mammal species of Regional and Urban Concern, including the grey treefrog, midland painted turtle, the wood frog, American toad and spring peeper.

Among the bird species of Regional Concern, the black and white warbler, blue-winged warbler, and winter wren are found in the cedar and hardwood forests. The horned lark, also of Regional Concern, is found in the agricultural areas and meadows. Grey treefrog was located in the wetland adjacent to Mountcrest Road and two midland painted turtles were found dead beside Airport Road. Locations of these breeding fauna can be viewed in Figure 14 of the **Natural Environment Existing Conditions Report** included in Appendix C.

Species at Risk

The Barn Swallow and Bobolink are listed on the Provincial Species at Risk list. The Barn Swallow was observed throughout the majority of the Study Area, foraging over agricultural land and the meadows adjacent to Airport Road where there are nesting opportunities on the structures along the road. The Bobolink was found outside the Study Area but has the potential to breed closer to Airport Road within the meadows aligning the southern half of the Study Area.

No other federally or provincially listed Species at Risk fauna were observed.

Significant Wildlife Habitat

There is no confirmed significant wildlife habitat within the Study Area, however the following is considered candidate significant wildlife habitat:

Seasonal Concentration Areas of Animals

- Waterfowl Stopover and Staging Areas (Terrestrial)
- Bat Maternity Colonies
- Turtle Wintering Areas
- Deer Winter Congregation Areas

Rare Vegetation Communities

- Sand Barren

Specialised Habitats for Wildlife

- Amphibian Breeding Habitat (Woodland)
- Amphibian Breeding Habitat (Wetland)

Habitat for Species of Conservation Concern (not including Endangered or Threatened species)

- Northern Brook Lamprey
- Snapping Turtle
- Eastern Ribbon Snake
- Monarch

Animal Movement Corridors

- Amphibian Movement Corridors
- Deer Movement Corridors

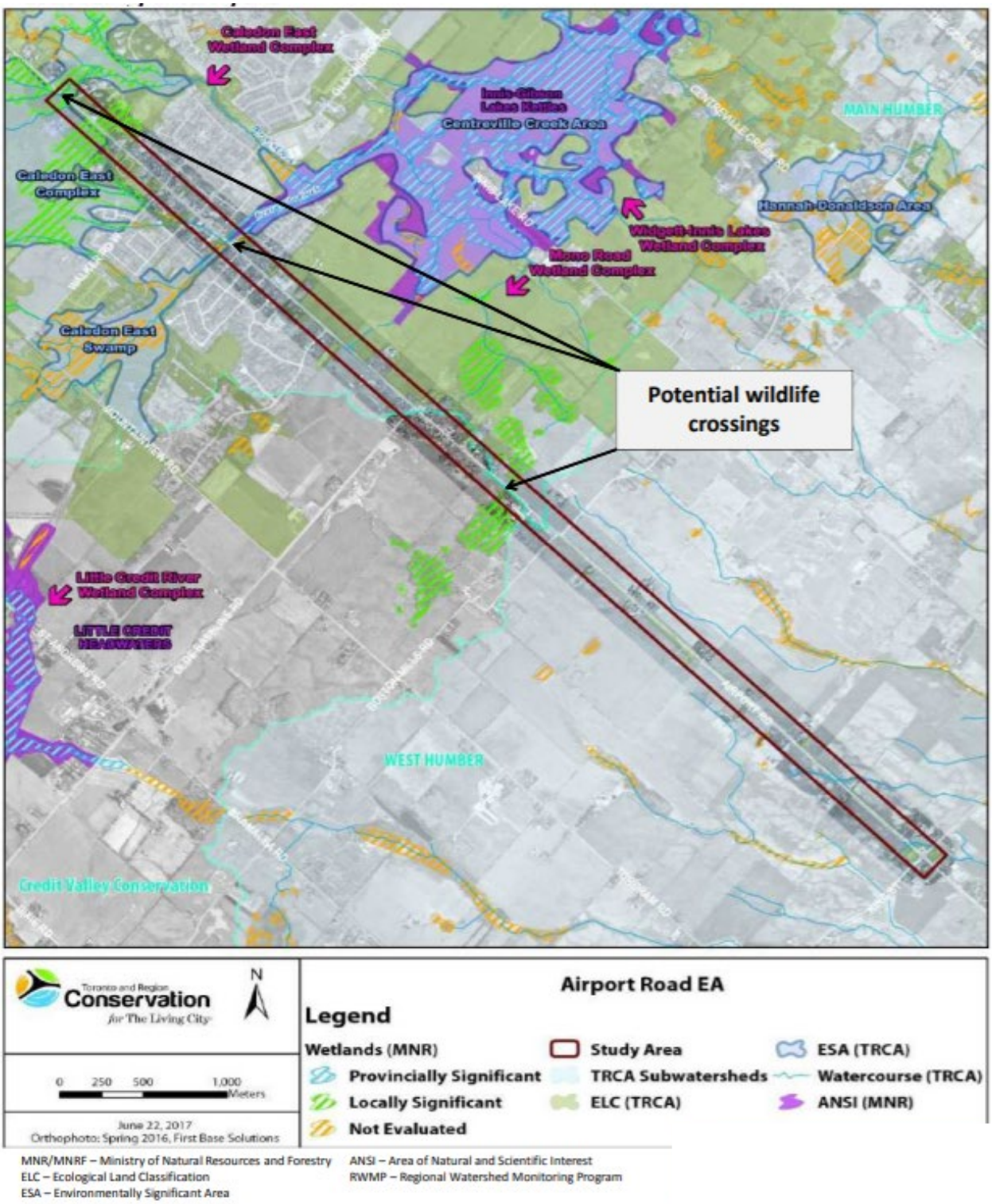
Wildlife Movement

Wildlife movement occurs in the Study Area. The Study Area has natural features that are part of natural cover extending beyond the Study limits and can serve as corridors for wildlife species such as the white-tailed deer. Movement corridors experience direct and indirect impacts from human use, especially traffic. Amphibian crossing hotspots are associated with the wetlands adjacent to the roads, while larger more mobile species are likely to use other areas of natural cover and may travel along the roadways and agricultural field hedgerows.

Potential amphibian crossings within the Study Area are described below and shown in Figure 7:

- Choruses of wood frog and spring peeper were mapped on the east side of Airport Road and wood frog on the west side. With active frog breeding wetlands on both sides of Airport Road, there is a high potential for crossing between the wetlands.
- On the east side of Airport Road, at Mountcrest Road, there are two wetland frog populations. To the north of this road, there are wood frog and spring peeper with additional green frog and American toad. Spring peepers have also been sighted to the south of Mountcrest Road.
- Two dead American toads were observed on Airport Road, 500m north of the junction with Olde Base Line Road.
- The strongest choruses of wood frogs and spring peepers were located to the east and west of Airport Road, specifically from the west side wetland for the wood frog and the east side wetland for the spring peeper.

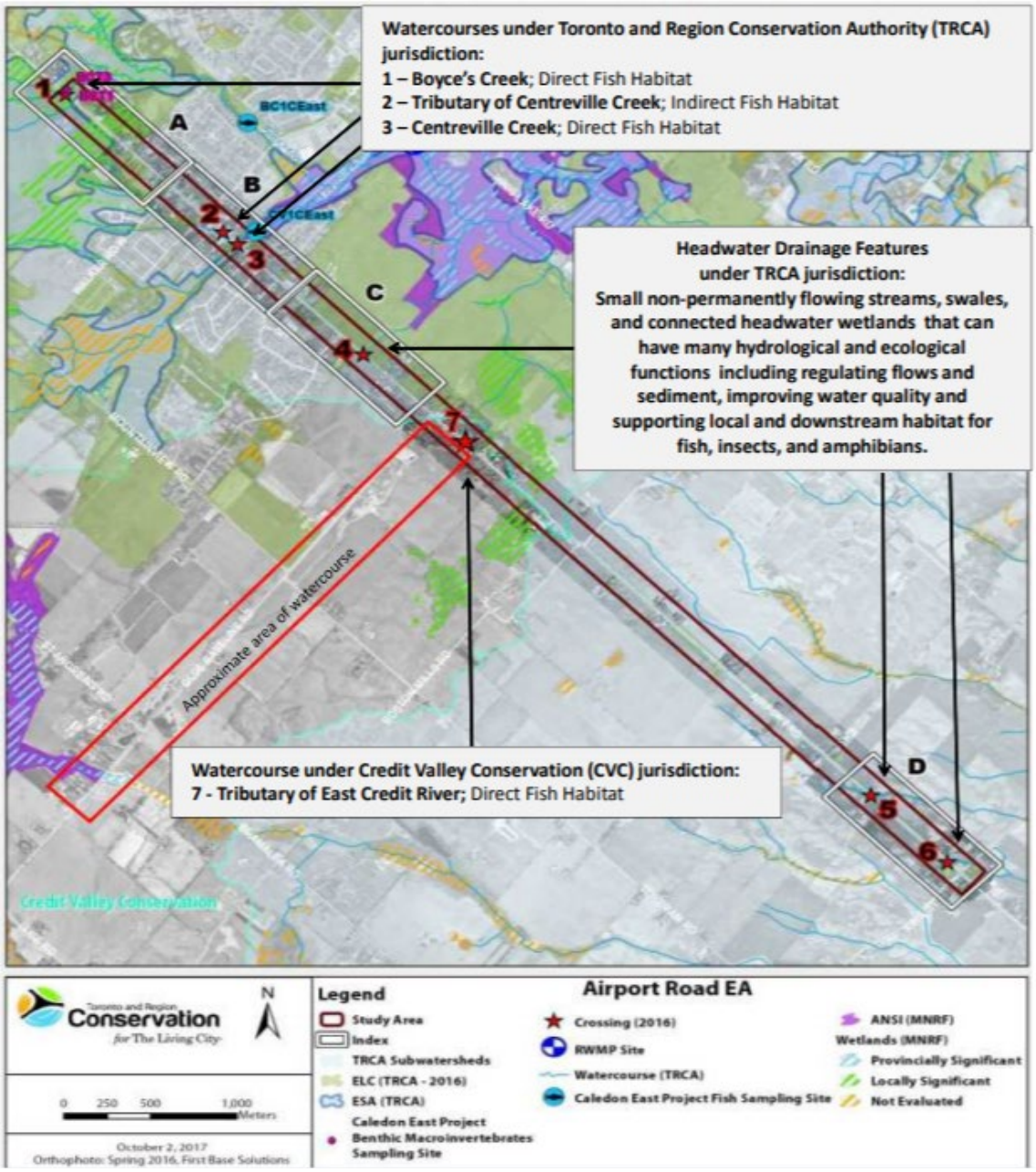
Figure 7: Potential Amphibian Crossing Locations



4.2.6 Fish and Fish Habitat

TRCA identified seven drainage features, characterized as either watercourses or headwater drainage features, that cross Airport Road within the Study Area (Figure 8). A headwater drainage feature (HDF) is defined as a non-permanently flowing drainage feature that may not have defined banks or bed. Figure 8 shows the location of the watercourse and HDF crossings on Airport Road. Each crossing is described in more detail below.

Figure 8: Watercourses and Headwater Drainage Features



4.2.7 Watercourses

Crossing 1

This crossing is located about 70m north of Huntsmill Drive where Boyce's Creek, a Humber River tributary, crosses Airport Road. The crossing structure is a 0.9m by 22m Corrugated Steel Pipe (CSP) culvert and is adjacent to a local significant wetland.

Upstream, water travels through a wetland with cattails, entering a grass-lined roadside ditch between a forested area and Airport Road before entering the culvert. Downstream, water travels through Phragmites-dominated wetland for nearly 12m before reaching a forested area. Evidence of groundwater seeps/springs in the form of watercress and rust seeps was noted downstream of the crossing. Riparian vegetation consisted of wetland and forest.

The watercourse has been determined to provide direct fish habitat.

Crossing 2

This crossing spans Airport Road between Parsons Avenue and the Caledon Trailway. It connects a tributary of Centreville Creek to Centerville Creek. The upstream end is located on the north side of Parsons Avenue nearly 34m west of Airport Road. Downstream is located nearly 65m east of Airport Road on the north side of the Caledon Trailway. The crossing structure is a CSP 0.85m in diameter.

The configuration and size of this crossing represents a barrier to fish movement. No fish were observed during the site visits. While the section of the feature upstream of the crossing is likely direct fish habitat, the feature at the crossing itself provides indirect fish habitat as this long underground crossing without a direct connection to Centreville Creek is a barrier to fish movement. Nonetheless, the crossing can transport materials to Centerville Creek.

Crossing 3

This crossing is located along Centreville Creek where it crosses Airport Road nearly 35m north of Mountcrest Road. This crossing is a concrete box culvert 4.3m wide, 0.87m high and 18m long.

The downstream side has two outfalls north and south of the box culvert structure. The northside outfall is a CSP culvert 1.45m in diameter and the southside outfall is a concrete pipe, 0.75m in diameter. Verification could not be made if the downstream outfalls were in operation. The upstream side of the box culvert did not have outfalls.

Upstream, Centreville Creek runs adjacent to a small unevaluated wetland and close to the Caledon Trailway. The stream also passes along private properties with lawn adjacent to the stream banks. Watercourse mean width in this section was two metres and the mean depth was 0.28m.

Downstream of the crossing structure, the watercourse runs parallel to the Caledon Trailway. This area is a designated natural area and where the Innis-Gibbs Lakes Kettles ANSI and Widgett-Innis Lakes Wetlands Complex Provincially Significant Wetland are found. Channel dimensions in the downstream section are similar to those of the upstream section with a mean width of two metres and mean depth of 0.29m.

The watercourse at this crossing provides direct fish habitat.

Crossing 7

This crossing is located approximately 230m south of Olde Base Line Road between Crossings 4 and 5, and is under the jurisdiction of Credit Valley Conservation (CVC). It is a coldwater system.

Water flows downstream from northeast to southwest and crosses Airport Road through a box culvert (2m wide by 1.1m high). Upstream of Airport Road, the watercourse terminates and is presumably piped underground stemming from a wetland. Downstream of Airport Road, the watercourse collects drainage from roadside ditches running parallel to Airport Road. As it exits the box culvert it flows in the southwest direction and travels through a series of private properties, agriculture fields and wetland features.

This watercourse contributes to downstream features and habitats (fish habitat, wetlands, and other tributaries).

4.2.8 Headwater Drainage Features

Crossing 4

This crossing is located about 175m south of Cranston Drive. The crossing structure is a 0.45m CSP culvert. Upstream on the west side of Airport Road, drainage from agricultural fields and road runoff enter a grass-lined roadside ditch. No defined channel was observed in the agricultural fields adjacent to the crossing. Downstream or on the east side of Airport Road, there is a roadside ditch and a swale through an agricultural field with no defined channel.

The crossing and the adjacent agricultural fields and roadside ditches were found to be dry during the September 2016 assessment and the following were observed:

Three HDFs are present at the Crossing 4 site:

Roadside ditch along the west side of Airport Road.
Roadside ditch along the east side of Airport Road.
Swale running through the agricultural field along Airport Road on the east side of the road.

The swale on the east side of Airport Road appears to be connected to the network of drainage features located outside of the Study limits. So, during large rain events or freshet events involving high volumes of runoff, this feature may transport material downstream provided that no downstream barriers to transport exist.

Agricultural cultivation and Airport Road have been identified as factors impacting the function of the drainage features assessed.

No watercourse is found at Crossing 4 and the HDF features have limited functions with respect to hydrology and riparian buffer. As the features at this crossing were found to be dry during all assessment periods, they likely do not provide direct or indirect fish and fish habitat.

Crossing 5

This crossing is located about 725m north of King Street. The crossing structure is a 0.6m by 22m CSP. Upstream on the west side of Airport Road, drainage from agricultural fields and road runoff enter a grass-lined roadside ditch. No channel was observed in the agricultural fields adjacent to the crossing. Downstream or on the east side of Airport Road, there is a roadside ditch and swale through an agricultural field with no defined channel.

Three HDFs were present at the Crossing 5 site:

A roadside ditch along the west side of Airport Road.
A roadside ditch along the east side of Airport Road.
A swale running southwest through the agricultural field on the east side of Airport Road.

The crossing and the adjacent agricultural fields and roadside ditches were found to be dry during the September 2016 assessment. At the April 2017 visit, roadside ditches had standing water and the swale had minimal flow. These conditions were the same at the June 2017 visit.

The swale on the east side of Airport Road appears to connect to other drainage features beyond the Study Area limits. Therefore, this feature may facilitate transport of materials downstream provided that no downstream barriers to transport exist. Agricultural cultivation and roads (Airport Road) have been identified as factors potentially impacting the function of the drainage features assessed.

No watercourse is found at this crossing. All three HDFs have limited riparian function. The swale in the agricultural field east of Airport Road has a contributing hydrological function while the two roadside ditches have limited functions. It is possible that the swale provides contributing functions with respect to fish and fish habitat, where it facilitates transport of materials to downstream fish bearing reaches.

Crossing 6

This crossing is about 100m north of King Street. The crossing structure is a 0.6m by 23.6m CSP culvert. Upstream on the west side of Airport Road, agricultural field drainage and road run-off enter a grass-lined roadside ditch connected to the culvert. No defined channel was observed in the agricultural field. Downstream on the east side of Airport Road, a roadside ditch and swale are running through an agricultural field.

The crossing and the adjacent agricultural fields and roadside ditches were found to be dry during the September 2016 assessment and the following were observed:

Four HDFs were found at the Crossing 6 site:

A tile drain in the agricultural field on the west side of Airport Road.
A roadside ditch on the west side of Airport Road.
A roadside ditch on the east side of Airport Road.
A swale through an agricultural field on the east side of Airport Road.

At the April 2017 visit, all features had standing water and minimal flow was observed where the water entered the culvert on the west side of Airport Road. At the June 2017 visit, following light rain, all features had standing water.

No wetlands occur upstream and no groundwater seepage was observed.

The swale on the east side of Airport Road connects to a roadside ditch running along the north side of King Street and to a culvert crossing under King Street nearly 77m east of Airport Road.

The King Street culvert connects to a ditch on the south side of King Street which connects to a drainage feature running south. This connection indicates that the swale HDF associated with Crossing 6 may, following large rain events or particularly high flow freshet events, facilitate transport of material downstream, if no barriers to transport exist downstream.

Agricultural cultivation and Airport Road have been identified as factors potentially impacting the function of the drainage features assessed.

No watercourse is found at this crossing. HDFs that are roadside ditches have limited riparian function, the tile drain HDF has a contributing function and the swale has a riparian function. The swale and the tile drain have a hydrological function and the two roadside ditches have limited functions. The swale likely provides contributing functions to fish and fish habitat where it may facilitate transport of materials to downstream reaches.

4.2.9 Fish Communities

The Study Area crossings from north of Castlederg Side Road (Crossings 1, 2, 3, 4 and 7) are classified as Small Riverine Coldwater Habitat and the crossings south of Castlederg Side Road (Crossings 5 and 6) are classified as Small Riverine Warmwater Habitat. Fish community data are available for Boyce's Creek (Crossing 1) and Centreville Creek (Crossing 3).

Centreville Creek

Seventeen (17) fish species have been captured in this Creek. Coldwater, coolwater and warmwater thermal guild species were present, with the majority belonging to the coolwater guild. All species captured were native and no Species at Risk were encountered.

The Brock Trout is found in Centreville Creek which rely on groundwater inputs for spawning and are used as a biological indicator of habitat condition. Due to their dependence on cold groundwater, Brock Trout will decline with water temperature increase as a result of land management activities disrupting the groundwater upwellings and/or resulting in warming of stream temperatures. The presence of Brock Trout has been declining since the start of TRCA's Caledon East monitoring project, which had collected yearly data from fish sampling sites between 2009 and 2016.

Boyce's Creek

Eight fish species have been captured in this Creek. The number of species has been declining since the beginning of the 2009 Boyce's Creek monitoring and remained low from 2012 to 2016. This may be due to the changes in water temperature and turbidity levels as a result of sediment input events from the pond on the private property located at 16399 Airport Road.

Coldwater, coolwater and warmwater thermal guild species were found with the majority belonging to the coolwater guild. All species captured were native and no Species at Risk were found. Similar to Centreville Creek, Boyce's Creek is inhabited by Brock Trout.

Species at Risk

No federally or provincially listed fish Species at Risk were captured during the fish community and benthic invertebrate surveys. None of the reaches of the Humber River watershed, which are designated as a Redside Dace habitat, overlap the Study Area. The nearest reaches are located 3km south and southeast of the southern Study limit.

4.3 Social Environment

4.3.1 Demographics

Table 12 summarizes the population and employment growth in Peel Region and the proportion in Caledon as outlined in the Regional Official Plan (Table 12; 2012).

Table 12: Population and Employment in Peel and Caledon

	2006		2021		2031	
	Region	Caledon	Region	Caledon	Region	Caledon
Population	452,800	59,500	635,000	87,000	727,000	108,000
Employment	155,900	21,400	280,000	40,000	314,000	46,000

The Region of Peel LTRP (2019) indicates that Peel's population is expected to grow by about 500,000 additional people and about 250,000 additional jobs. By 2041, population and employment in Peel will total about 2 million and 970,000, respectively.

Peel's demographic profile will change substantially in the coming years with the seniors population, defined as those aged 65 and older, doubling by 2031. The Study Area lies within the Peel Health Data Zone (PHDZ) CI, which indicates a higher proportion of C1's population is aged 50-74 years compared to Peel. PHDZ C1 includes most of Caledon with the exception of an area in southeast Caledon.

4.3.2 Existing Land Uses

Land uses abutting the Study corridor are predominately commercial, residential, and agricultural with some recreational and institutional throughout:

- The southern Study limit is within the historical community of Sandhill, with commercial and residential development.
- The area immediately north of Sandhill to north of Castlederg Side Road-Boston Mills Road is characterized by active agricultural fields and rural residences. Of note is a nursery business on the east side of Airport Road approximately 220m north of Boston Mills Road.
- The Study corridor passes through the historical community of Mono Road from north Castlederg Side Road-Boston Mills Road to Olde Base Line Road, with commercial and residential uses.
- The area between Olde Base Line Road and the Caledon East boundary south of Cranston Drive is currently agricultural and rural residential.

- Airport Road passes through the historical community of Caledon East from south of Cranston Drive to Leamster Trail, with mixed commercial and residential development. Of note are the following uses:
- Institutional (Caledon East Public School property) on the west side of Airport Road north of Cranston Drive,
- Agricultural on the east side at 15717 Airport Road that is subject to development,
- Commercial (Foodland plaza) on the east side of Airport Road south of Hilltop Drive,
- Institutional (Sewage Pumping Station) on the southeast corner of Airport Road and Mountcrest Road,
- Recreational (Caledon Trailway) that crosses Airport Road north of Mountcrest Road,
- Commercial (LCBO store) on the west side of the Airport Road and Old Church Road intersection, and
- Institutional (place of worship) on the southwest corner of Airport Road and Walker Road.
- Lands from Leamster Trail to north of Huntsmill Drive are characterized by low lying cedar wetlands with some rural residential uses.

Land uses abutting Old Church Road within the Study limits are primarily residential and institutional (e.g., place of worship, Regional paramedic services). Of note are the Caledon East Fire Hall, Caledon Community Complex and Town Hall on the south side of Old Church Road beyond the east Study limit.

4.3.3 Designated Land Uses

Schedules A and D in the Town of Caledon Official Plan illustrate the designated land uses within the Study Area (see Figure 9 and Figure 10).

Prime Agricultural Areas

Lands designated as Prime Agricultural Areas are shown abutting Airport Road from north of King Street to Castlederg Side Road, interspersed from Castlederg Side Road to Olde Base Line Road, and from Olde Base Line Road to the south limit of Caledon East (south of Cranston Drive).

Section 5.1.1.2 of the Town of Caledon's Official Plan notes that Prime Agricultural Areas generally coincide with a relatively large contiguous area of high capability agricultural lands (Classes 1, 2 and 3 lands in the Canada Land Inventory of Soil Capability for Agriculture). The Town's Official Plan seeks to promote a viable and sustainable agricultural industry, in part by giving priority to agriculture and its needs within the Prime Agricultural Area.

Section 5.4.1.3 of Peel's Official Plan also promotes healthy rural communities that contain living, working and recreational opportunities as well as respect the natural environment and resources.

Environmental Policy Areas

Environmental policy areas are shown abutting Airport Road from north of Boston Mills Road to Olde Base Line Road, and along the Centreville Creek crossing in Caledon East.

Figure 9: Town of Caledon Land Use Plan

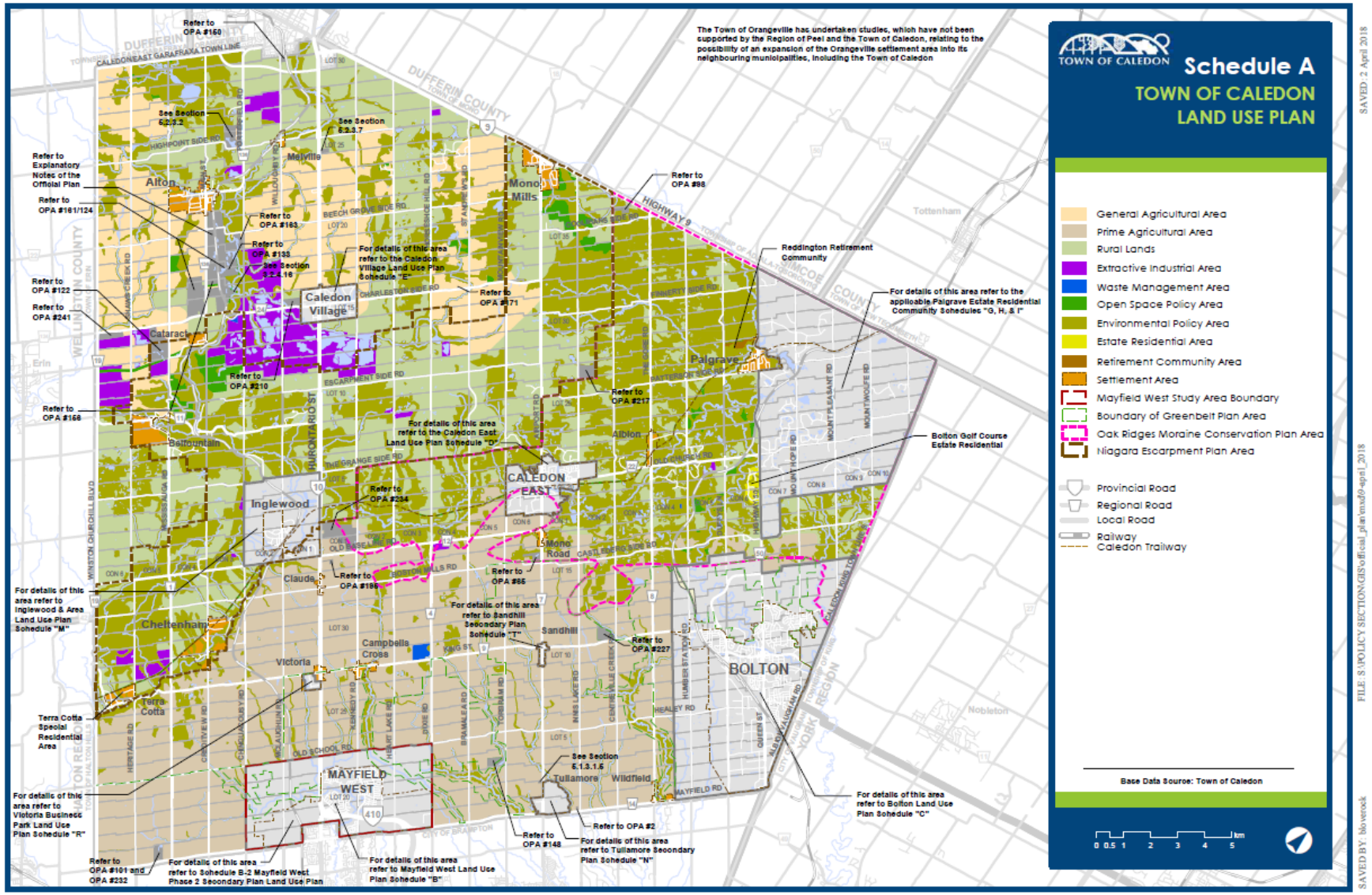
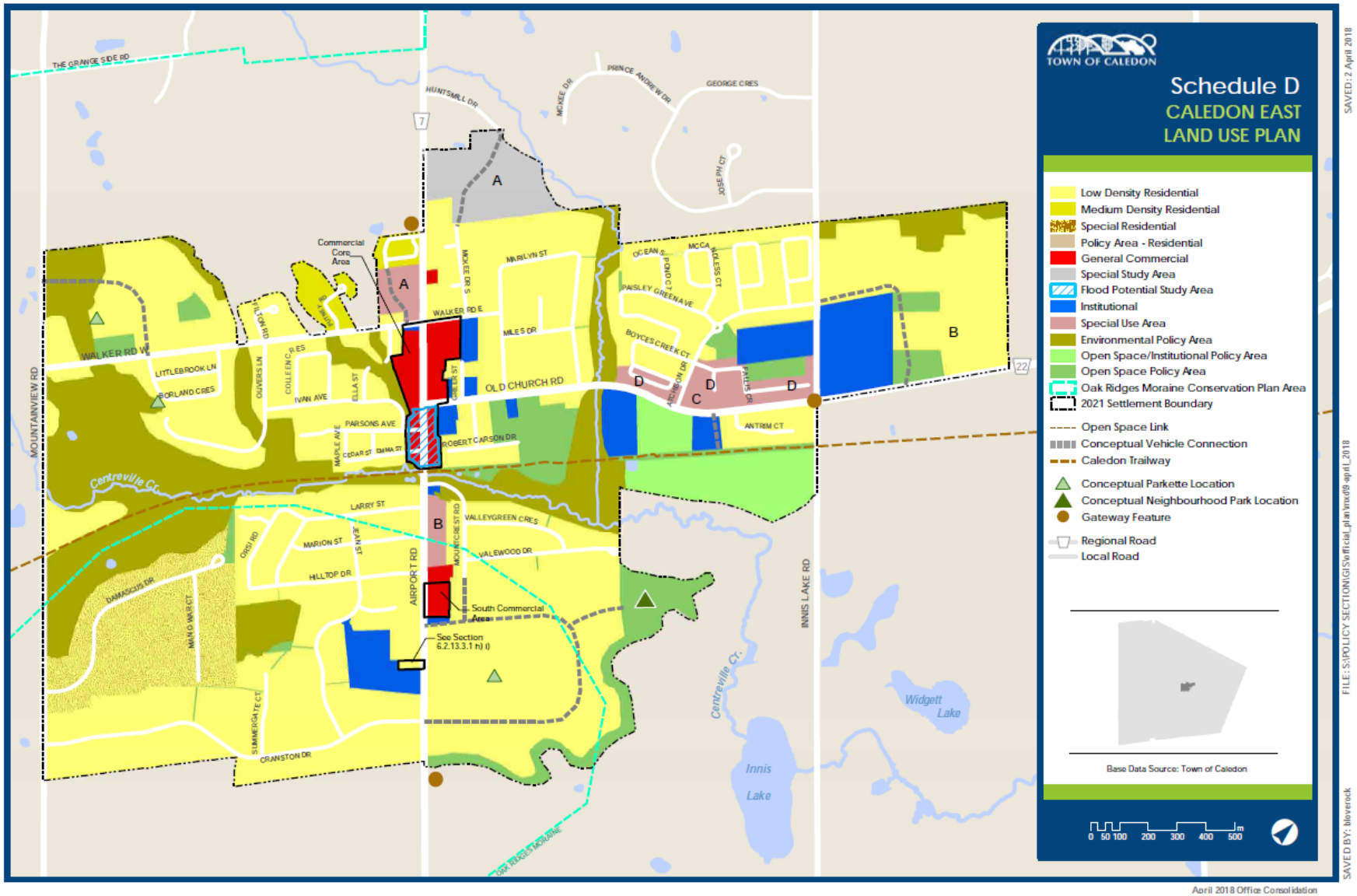


Figure 10: Caledon East Land Use Plan



Environmental Policy Areas include all Natural Core Areas and Natural Corridors identified in the Town of Caledon's Official Plan. Lands designated as part of an Environmental Policy Area are not to be damaged or destroyed, unless as a result of an approved permitted use.

Settlement Areas

Sandhill is a Settlement Area that surrounds the intersection of Airport Road and King Street. Sandhill is one of three small communities in Caledon that support Rural Service Centres (such as Caledon East) for industrial and commercial development.

Mono Road is a Settlement Area that includes Airport Road from Olde Base Line Road to a point about halfway between Olde Base Line Road and Boston Mills Road. Mono Road is one of eight Hamlets within Caledon, which are small residential communities that are expected to experience slow or no growth to 2021.

Caledon East is a Settlement Area that includes Airport Road from south of Cranston Drive to north of Leamster Trail. Airport Road forms part of the Settlement Area boundary from Leamster Trail to a distance about halfway between Leamster Trail and Huntsmill Drive. Caledon East is one of three Rural Service Centres within Caledon, which are designated as primary growth areas to 2021.

Open Space Policy Areas

Some land on the south side of Old Church Road from east to west of Marilyn Street, including a strip of land that connects perpendicular to the east side of Airport Road at the south Caledon East boundary, is designated as an Open Space Policy Area. Open Space Policy Areas include intensive and non-intensive recreational uses, and do not include lands designated as Environmental Policy Areas.

Residential

The predominant land use abutting Airport Road from south of Cranston Drive to the Caledon Trailway, and from Walker Road to north of Leamster Trail, is low density residential. This is also the predominant land use on Old Church Road within the Study limits. The low density residential designation permits 16.6 units per hectare of uses ranging from single- and semi-detached dwellings to linked dwelling units to duplexes to freehold townhouse units.

The residential area of Leamster Trail is shown as medium density residential. This designation permits 19 to 30 units per hectare of uses ranging from single- and semi-detached dwellings to linked dwelling units to townhouses to triplexes and fourplexes.

Institutional

Institutional land uses are designated in areas where currently there are places of worship, a school, a utility plant, and a pumping station. This land use designation is intended for these types of institutional

uses and others including hospitals, medical offices, government buildings, libraries, senior citizens homes, day care centres, and cemeteries.

General Commercial

General commercial areas are designated on lands south of Hilltop Drive on the east side of Airport Road, and on both sides of Airport Road from the Caledon Trailway to Walker Road (including one relatively small area on the east side, north of Walker Road). The General Commercial designation permits a wide range of retail and service uses.

Downtown Caledon East from the Trailway to Walker Road is shown as the Commercial Core Area. Redevelopment of commercial sites are encouraged within the Commercial Core Area.

Special Use Areas

Lands on the east side of Airport Road between Hilltop Drive and north of Larry Street are shown as Special Use Area B. This area is noted to have "a number of commercial enterprises within the existing residences". Changes to land use in this area are not permitted until a study on the suitability of the area as a mixed commercial and residential district is completed.

Lands in the northwest quadrant of Airport Road and Walker Road are shown as Special Use Area A. This area is "intended to be an attractive northern gateway to the Caledon East Commercial Core Area", incorporating the natural and cultural heritage features of the site.

4.3.4 Air Quality

Transportation is one of the existing sources of air emissions in the Study Area. Vehicular traffic produces a variety of contaminants as a result of fuel combustion inside the engine, evaporation of fuel from the tank, brake and tire wear, and re-suspension (also known as re-entrainment) of loose particles on the road surface (silt) as the vehicle travels over the road surface.

Vehicular traffic emits various sources of pollutants. The contaminants of interest for this Study include:

Respirable particulate matter,

Inhalable particulate matter,

Carbon monoxide,

Nitrogen dioxide,

Acetaldehyde,

Acrolein,

Benzene,

1,3-butadiene, and

Formaldehyde.

Operable windows and outdoor areas of residences in close proximity to the Study Area are the most sensitive to these air emissions.

For more information, see Appendix E for the **Air Quality Assessment Report** completed by RWDI. The air quality impact assessment for this project is further summarized in Section 8 of this ESR. *Note: Nitrogen Dioxide (NO_2) Canadian Ambient Air Quality Standards (CAAQS) have been updated by the Ministry of Environment, Conservation and Parks (MECP) since completion of the report.*

4.3.5 Noise

The Region of Peel and Town of Caledon guidelines for assessing road traffic sound level indicate the criterion for road traffic noise in outdoor living areas is 55dBA (16-hour daytime average), and for outside a bedroom window is 50dba (8-hour nighttime average). Noise barriers are considered for road traffic noise when noise level exceeds 60dBA (average over a 16-hour daytime period) at 1.5 metres above ground, 3 metres away from the rear wall of a dwelling that has reverse frontage. Within the Study limits, there are four areas of existing noise barriers along Airport Road from Olde Base Line Road to Huntsmill Drive.

The Town of Caledon noise bylaw 86-110 prohibits the operation of any equipment in connection with construction between 11 p.m. on one day to 6 a.m. the next day. In addition, the Ministry of Environment, Conservation and Parks (MECP) stipulates limits on sound level emissions from individual items of equipment rather than for overall construction noise. Sound emission standards for the various types of construction equipment used must meet the specified limits contained in the Ministry's Publication for Noise Pollution Control, specifically for construction equipment.

For more information, see Appendix F for the **Road Traffic Noise Assessment Report** completed by RWDI. The noise impact assessment for this project is further summarized in Section 8 of this ESR.

4.4 Cultural Environment

4.4.1 Archaeology

There are eight registered archaeological sites located within one kilometre of the Study Area, two of which are within the Study Area:

- Part of the Tarbox Site, an 1800's domestic occupation property with Cultural Heritage Value or Interest.
- Part of the Yeoman Site, a mid to late-nineteenth Euro-Canadian homestead with Cultural Heritage Value or Interest.

Parts of the Study Area exhibit archaeological potential and require additional archaeological assessment prior to any proposed impacts, while other parts of the Study Area have been previously assessed and do not require further archaeological assessment. Areas of the Study with deep and

extensive land disturbance, low and wet conditions, or slopes in excess of 20 degrees do not retain archaeological potential and therefore do not require further archaeological assessment.

Additional details, including a map of areas with existing archaeological potential, are included in Appendix G in the **Stage 1 Archaeological Assessment Report** completed by ASI. Recommendations for additional assessment and mitigation are further summarized in Section 8 of this ESR.

4.4.2 Indigenous Treaty Rights and Interests

The Study Area is located within Treaty 19, the Ajetance Purchase, signed between the Crown and the Mississaugas of the Credit First Nation in 1818. In addition, the Metis Nation became located throughout Ontario during the eighteenth century and the Huron-Wendat First Nation also have archaeological sites throughout Ontario, indicating the potential for interest in the Study Area.

4.4.3 Cultural Heritage

Policies in Section 3.3 of the Town of Caledon Official Plan recognize that cultural heritage landscapes and built heritage resources need to be identified, and that cultural heritage landscapes and significant built heritage resources need to be conserved.

During this Class EA Study, ASI identified 63 cultural heritage resources within the Study Area, including 50 built heritage resources and 13 cultural heritage landscapes. These included:

- 31 residences on Airport Road, Walker Road, Old Church Road and Olde Base Line Road,
- 11 farmscapes on Airport Road,
- Eight commercial structures on Airport Road,
- One institution on Airport Road,
- Five residences and drive sheds on Airport Road,
- One commercial/former residence and drive shed on Airport Road,
- One barn on Airport Road,
- Three churches on Airport Road and Old Church Road,
- A heritage character area (Caledon East), and
- A Canadian Heritage River (a tributary of the Humber River).

Four of the identified cultural heritage resources are designated under Part IV of the Ontario Heritage Act, 49 are listed on the Town of Caledon Built Heritage Resource Inventory, and nine were identified during field review.

Full details with a location map of the above cultural heritage resources are included in Appendix H in the **Cultural Heritage Resource Assessment Report** completed by ASI. The cultural heritage impact assessments completed for this Study are further summarized in Section 8 of this ESR.

4.5 Economic Environment

4.5.1 Business Community

The Town of Caledon by-law (BL-2014-003) designates commercial areas that abut Airport Road within Caledon East as a Community Improvement Project Area. The bylaw enabled the establishment of the Community Improvement Plan to facilitate the redevelopment, revitalization, prosperity, and beautification of Caledon East. The Community Improvement Plan provides financial incentives to businesses located in the Community Improvement Project Area.

Existing businesses in Mono Road and Caledon East include the plant nursery, food stores, restaurants, hair salons, esthetic services, auto repair shops and fuel stations, among others. Agriculture is active outside the Settlement Areas and is an important part of the local economy. Protection of agricultural resource areas and the viability of the sector ensure local food production and a healthy rural economy.

4.5.2 Tourism

In 2014, the Town of Caledon developed a tourism strategy to outline the strategic opportunities for the development of its tourism sector for Caledon to be positioned as a tourism destination. Tourism in Caledon includes Arts, Culture and Heritage; Soft Adventure; Bicycle Touring; Sport Tourism; Culinary and Agri-Tourism; Equine; and a future opportunity for Health and Wellness Tourism.

4.5.3 Goods Movement

Goods movement supports Peel's economy and so it is important to improve the goods movement network in Peel to enhance safety, sustainability, and efficiency. This can mean implementing strategies such as improving planning policies for goods movement land uses, managing the demand and supply of moving goods, and providing for truck routes. The implementation of these strategies will need to consider impacts on Peel's community, environment, and economy.

The Region of Peel 2012 Strategic Goods Movement Network (SGMN) Study identifies Airport Road and Old Church Road as primary truck routes which would allow trucks to pass through Caledon East. Olde Base Line Road from Airport Road to Highway 10 is currently restricted to heavy trucks and has been identified as a potential primary truck route. The Olde Base Line Road route would divert some heavy trucks from downtown Caledon East, with the intent of providing a balance between the needs of local goods movement and community improvement.

4.6 Physical Environment

4.6.1 Topography, Physiography and Geology

Regional topography, physiography and geology is summarized in Terraprobe's Hydrogeological Report in Appendix L.

The approximate ground surface elevation within the Study corridor varies between 300 metres above sea level (masl) and 280 masl. The corridor generally slopes from north to south.

The Study corridor traverses the Oak Ridges Moraine, the Niagara Escarpment, and the South Slope physiographic regions. The bedrock within the corridor is of the Queenston Formation, which is comprised of shale, limestone, dolostone, and siltstone. The depth to bedrock within the north Study limit is approximately 24.7m and approximately 6.1m within the south limit. The depth to bedrock within the central portion of the corridor is greater than 50m.

The northern portion of the Study corridor is located within the Caledon East Meltwater Channel, which follows the valley occupied by the East Credit River and Centreville Creek. A shallow unconfined aquifer that is recharged by Centreville Creek is located within the meltwater channel. A second deep (hydraulically separate) Granite Stones Aquifer is located within the Study Area. The aquifer is confined by a deposit of Newmarket Till and is expected approximately 55m below ground surface at Caleodn East. The Granite Stones Aquifer complex is artesian and an artesian pond is located at 16399 Airport Road. A third aquifer is anticipated in the buried bedrock valley aquifer complex, approximately 150m below ground surface at Caledon East.

4.6.2 Soil and Pavement Condition

A geotechnical investigation was carried out by Terraprobe to determine soil and pavement conditions within proposed road improvement areas.

Topsoil, a flexible pavement, and fill material consisting of firm to very stiff silty clay, loose to compact sand and gravel, and very loose to dense silty sand were encountered at the site. The native overburden deposits consist of firm to hard silty clay till, very loose to very dense sand to sandy silt and very soft to very stiff clayey silt. Topsoil layers ranged in thickness from 40 millimetres (mm) to 250mm. The pavement subgrade consists of silty clay to clayey silt, silty sand to silt, and gravelly sand to gravel soils.

A visual pavement condition survey of Airport Road was carried out in accordance with procedures outlined in the MTO Manual for Condition Rating of Flexible Pavements – Distress Manifestations (SP-024). The pavement condition was generally assessed to be between Good and Excellent.

More details are included in Terraprobe's **Geotechnical and Pavement Design Report** in Appendix J.

4.6.3 Contamination Overview

Potential contaminating activities within the Study Area include commercial auto body shops, gasoline and associated products storage in fixed tanks, importation of fill material of unknown quality, metal fabrication, operation of dry cleaning equipment (where chemicals are used), salvage yard including automobile wrecking, and other historical spills. Contaminants of concern include metals, volatile organic carbons, and petroleum hydrocarbons.

Environmental site assessments including soils and groundwater investigation may be required to investigate the potential impacts within the project site caused by surrounding land uses. There may be soil and groundwater disposal implications when completing the replacement of culverts or other roadway works across the site.

More details are included in Terraprobe's **Contamination Overview Study Report** in Appendix I.

4.6.4 Fluvial Geomorphology

Seven regulated watercourse crossings are found within the Study Area and located within the jurisdictions of the CVC and TRCA. Three of the features that cross Airport Road are classified as headwater drainage features, while the remaining four are regulated watercourse crossings:

1. Boyce's Creek, a tributary of Centreville Creek (Crossing 1)
2. Unnamed tributary of Centreville Creek (Crossing 2)
3. Centreville Creek (Crossing 3)
4. Tributary of the East Credit River (Crossing 7)

With the exception of the enclosure of sections of the Centreville Creek Tributary in the vicinity of Airport Road (Crossing 2) and the continued lack of a riparian buffer along the East Credit River Tributary downstream of Crossing 7, the naturalization of several former agricultural fields and the conversion of the Canadian National Railway (CNR) line to the Caledon Trailway have likely improved local channel form and aquatic and riparian habitats. Results of the field assessments indicated that all four regulated watercourses were generally stable, with limited evidence of active erosion within the extents assessed.

Most watercourses in southern Ontario have a natural tendency to develop and maintain a meandering planform, provided there are no spatial constraints. A meander belt width or erosion hazard assessment estimates the lateral extent that a meandering channel has historically occupied and will likely occupy in the future. This assessment can determine the potential limit of an activity (e.g. land development) adjacent to a watercourse, or the floodplain width required to restore a stream to a naturally functioning state.

The meander belt widths for Boyce's Creek (Crossing 1) and Centreville Creek (Crossing 3) were determined based on a modelling approach and measurements, respectively. Boyce's Creek has a modelled width of 15.1m while Centreville Creek has a measured width of 20m.

The meander belt widths for the Centreville Creek Tributary (Crossing 2) and East Credit River Tributary (Crossing 7) were not determined. There is no open channel within the road allowance at the Centerville Creek Tributary and the likelihood of daylighting the creek within the road allowance is low due to the conflict with another road (Parsons Avenue) and private properties. Similarly, the culvert inlet at the East Credit River Tributary was located in private property well outside of the road allowance.

Additional details are included in the GEO Morphix **Fluvial Geomorphological Assessment Report** in Appendix K.

4.6.5 Hydrogeology

A hydrogeological investigation was undertaken by Terraprobe to assess the groundwater conditions and preliminary dewatering requirements for potential construction activities within the Study Area. A detailed site inspection was conducted on November 21, 2017 to assess the presence of features which are significant from a hydrogeological viewpoint. In particular, the site Study Area was inspected to assess the following:

- The presence of drainage features or depressions that may allow for ponding and significant or enhanced water infiltration.
- Areas of seasonally high groundwater levels and/or watercourses that may receive groundwater discharge and seepage.

The results show that there are several tributary crossings located across the Study Area and the Study Area topography generally slopes towards the south. It is noted that drainage ditches are present along several locations adjacent to the municipal road and it is anticipated that surface water flows along the ditches and into the local tributaries. The surrounding areas are covered with vegetation across the majority of the Study Area.

Domestic or municipal water wells were not observed during the site reconnaissance. The Study Area consists mainly of an asphalt paved roadway with pedestrian sidewalks on the west and east sides where the roadway passes through the village of Caledon East. Catch basins and municipal services were also noted within Caledon East.

The results of the investigation indicate the following hydrogeological features:

- A private potable supply well exists within the Study Area. It is expected that private wells have been decommissioned in the area surrounding Caledon East and properties are being serviced by municipal sewer and potable water. The remainder of the Study Area may be serviced by private wells.

- A portion of the Study Area is identified predominately within Settlement Areas of the Oak Ridges Moraine Plan area and the Protected Countryside area of the Greenbelt Plan area. The Study Area falls within a groundwater recharge management area (Wellhead Protection Zone A, B and C) in the north area of the project. The reduction of recharge following construction is not anticipated based on the nature of the proposed works (i.e., road widening and culvert extensions).
- Soils within the Study Area can be characterized as deposits of fill overlying silty sand to sandy silt deposits atop silty clay glacial till. Glacial till deposits are of low permeability. More permeable sand layers were encountered within the silty clay till which may allow for local lateral groundwater flow pathways over limited areas of the Study Area.
- Stabilized groundwater levels were observed at a depth of 3.1m below existing grade at the central section of the Study Area and a depth of 2.0m below existing grade at the northern section of the Study Area.
- Based on a review of the in-situ test, the grain size analysis and published hydraulic conductivities for the investigated soils, the hydraulic conductivity considered for sandy silt to silty sand soils is 1×10^{-6} m/s.

Additional details are included in Terraprobe's **Hydrogeological Study Report** in Appendix L.

4.6.6 Drinking Water Source Protection

Credit Valley, Toronto and Region, and Central Lake Ontario (CTC) are the three drinking water source protection areas which collectively make up the CTC Source Protection Region. The CTC covers an area of 25 watersheds over 10,000km^2 between the Oak Ridges Moraine and Lake Ontario (Approved Source Protection Plan: CTC Source Protection Region, 2015).

Correspondence received from the CTC Source Protection Region in April 2018 confirmed that the Study Area is located in the Toronto and Region Source Protection Area. In the event that an activity associated with a proposed project poses a risk to drinking water, the Project Team must document how the project adheres to or has regard to applicable policies in the CTC.

Following additional correspondence received from the Region's Risk Management Official for source water protection in 2019 and 2021, the following vulnerable areas (under the Clean Water Act, 2006) were identified within the Study Area:

Wellhead Protection Area (WHPA)

The WHPA is the area surrounding a well where contaminants are reasonably likely to move forward or reach the well. Of note for this Study are the WHPAs for the Region's Caledon East Wells 2, 3 and 4a.

Initially, the project site was located within the WHPA for the Region's Caledon East Well 2. However Well 2 was decommissioned in November 2017 and the WHPA mapping contained within the approved CTC Source Protection Plan was not yet amended. Based on this update, the proposed project is not considered to pose a significant threat to sources of drinking water supply.

Policies of the CTC Source Protection Plan (SWG-11 and SWG-12) apply to 'a stormwater management facility designed to discharge stormwater to land or surface water'. A stormwater works discharge can only be a significant threat in a WHPA - A and B where the vulnerability score is high (value of 10 as per source protection plan criteria).

Part I of Policies SWG-11 and SWG-12 precludes any discharge, including infiltration, from a stormwater management facility where it would be a significant drinking water threat in the future. Moreover, Low Impact Development (LID) measures which would allow infiltration of discharge within the 100 metre radius of a municipal well (WHPA – A) would be prohibited.

An activity within the WHPA (A and B with high vulnerability score of 10) poses a significant drinking water threat where the drainage area is greater than 100ha and the predominant land use is rural, agricultural, or low density residential. For this project, Caledon East Well 2 was decommissioned and the WHPA-B for Caledon East Well 3 does not transect the Study limits. Although the Study limits transect the WHPA-D for the Caledon East Well 4A, there are no associated policy implications or constraints.

Significant Groundwater Recharge Area (SGRA) and Highly Vulnerable Aquifers (HVAs)

A SGRA supplies a community or private residence with drinking water and is characterized by porous soils, which allow water to seep easily into the ground and flow to an aquifer.

HVAs can be easily changed or affected by contamination from both human activities and human processes as a result of their intrinsic susceptibility (as a function of the thickness and permeability of overlaying layers), or by preferential pathways to the aquifer.

Under the technical framework created by the Clean Water Act, it is only possible to have a moderate or low drinking water threat in a SGRA or HVA. Policies that apply within these areas encourage best management practices for the application, handling, and storage of road salt and for the handling and storage of hazardous chemicals. However, these activities are not proposed as part of the project.

Given the above understanding, there is no risk or concern for drinking water source protection as a result of this project.

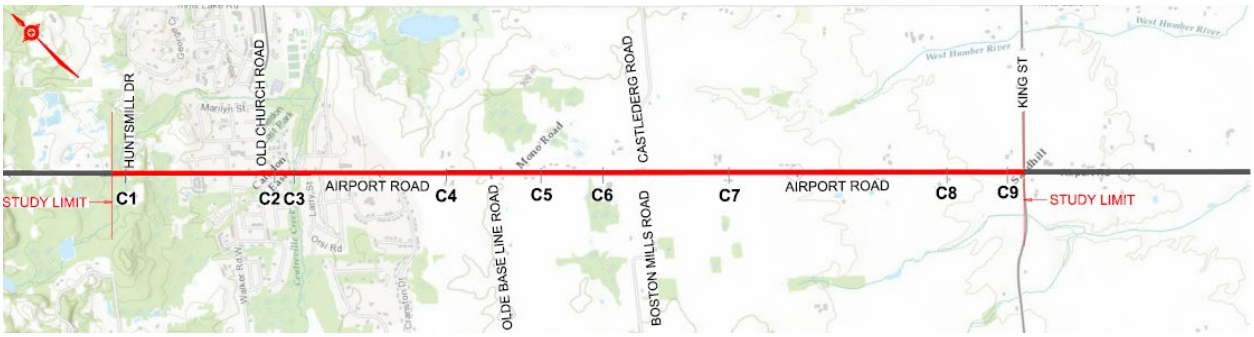
4.7 Engineering Characteristics

4.7.1 Drainage and Stormwater

The Study Area is along the northeastern boundary of the Credit River watershed in the community of Mono Road, and within the northwestern part of the Humber River watershed. Most of the Study Area is located within the Main Humber and West Humber River subwatershed, which is part of the Humber River watershed. Centreville Creek, a tributary of the Main Humber River, crosses Airport Road just south of the Caledon Trailway. The Centreville Creek subwatershed covers approximately 2200ha from the Niagara Escarpment and Oak Ridges Moraine through Caledon East and predominantly rural land used for agricultural and forest management.

Figure 11 shows the location of nine drainage culverts in the Study corridor. There are seven CSP culverts (between 450mm – 900mm), and two concrete box culverts that convey external flows across Airport Road. Existing roadside ditches also provide water quality/quantity control to Airport Road runoff before discharging to the receiving systems.

Figure 11: Location of Drainage Culverts



Storm runoff from south of Walker Road to 60m south of Hilltop Drive is collected by storm sewers and conveyed to Centreville Creek. The watercourses convey flow through rural or agricultural areas and pockets of estate/residential uses adjacent to Airport Road. Seven low points located along Airport Road also provide an overland flow route to major system runoff.

Although there are no stormwater management facilities adjacent to the Study Area, a stormwater management pond is proposed as part of a proposed 15717 Airport Road Residential Subdivision development.

Additional information can be found in IBI's **Stormwater Management Report** in Appendix N. The potential drainage impacts and proposed stormwater management plan for this project are further summarized in Section 8 of this ESR.

4.7.2 Structural

There is one structure within the Study Area, the Centreville Creek culvert. The structure has a south-north orientation and is located on Airport Road approximately 0.24km south of Old Church Road. The culvert was built in 1960.

The culvert carries two lanes of predominately vehicular traffic across Centreville Creek in one continuous span with a crossing length of 4.3m and a maximum clearance of 1.1m. The deck has a travel width of 8.35m and an overall width of 17.7m.

The crossing is heavily used with truck volumes of up to 10 to 25% of the total traffic. The speed limit is 50km/h at this location and there is no load limit posted at this site.

The Region's biennial inspection in 2016 and IBI's visual inspection in 2017 of Airport Road over Centreville Creek indicated that the structure at this location was in good condition overall. However, rehabilitation was recommended to improve the durability and prevent further concrete deterioration of the structure.

4.7.3 Utilities and Municipal Infrastructure

Airport Road currently has underground sanitary wastewater infrastructure ranging from 250mm to 900mm diameter. Due to the extensive steep uphill grade between Mountcrest Road and Hilltop Drive at Caledon East, the sanitary for Caledon East was collected at the Caledon East sewage pumping station located on the southeast corner of Airport Road and Mountcrest Road, which was then pumped through a 300mm ductile iron forcemain to the top of Hilltop Drive. From here, the sanitary line continues flowing south due to the pipe design slope and gravity. Steel encasement was installed for both the sanitary lines and watermain crossings at the box culvert located at Caledon Trailway. Sanitary wastewater infrastructure is located underground throughout the entire project limits for Airport Road and Old Church Road.

There is a 300mm diameter Polyvinyl Chloride (PVC) watermain running north from the Glen Echo Nurseries entrance along the west side of the corridor towards the north limit of the project. The watermain provides water services to all units along the corridor, as well as providing water connections to all residential side streets.

Since the village of Caledon East is an urbanized area, the catchbasin and storm network are found south of Hilltop Drive to Walker Road. Old Church Road is also urbanized thus the catchbasins and storm infrastructure are also found underground and connect with the mainline at the Airport Road intersection. Intersections at Olde Base Line Road and Cranston Drive contain some existing storm pipes which are drained to ditches along the sides of the road. The sizes of the storm pipes vary between 300mm and 900mm diameter.

Other major utilities include overhead hydro poles running along the west side of Airport Road from the south limit before crossing to the east at 330m south of Olde Base Line Road and continuing east up to the north project limit. Hydro poles along the north side of Old Church Road also connect with the lines along Airport Road. These hydro poles are shared with telecommunication infrastructure from Bell and Rogers. Bell telecom lines run overhead and underground connecting with various Bell pedestals throughout the corridor.

Enbridge gas lines are underground along the corridor at various locations and often on both sides of the roadway since there has been some recent new installations. Some of the infrastructure is to be abandoned once their proposed plan is completed. The size of these gas mains vary from 30mm to 150mm diameter.

5. CONSULTATION

5.1 Consultation Plan

An extensive consultation program was developed for this Study to invite public comments early and often throughout the Class EA process. The Region prepared a consultation plan at the onset of the Study, outlining potential consultation activities with stakeholders, indigenous communities, the general public, and review agencies. This included additional points of contact with the public, above the minimum MEA requirements. It also included establishing a Community Working Group to represent a wide range of local community interests and provide a balance of perspectives.

The following external agencies were contacted during the Study:

Study Contact List as of May 2021
Federal Agencies
Canadian Environmental Assessment Agency
Environment and Climate Change Canada
Fisheries and Oceans Canada
Indigenous and Northern Affairs Canada
Transport Canada
Provincial Agencies
Infrastructure Ontario (requested to be removed from the mailing list in 2018)
Ministry of Agriculture, Food and Rural Affairs
Ministry of Community Safety and Correctional Services
Ministry of Environment, Conservation and Parks
Ministry of Indigenous Relations and Reconciliation
Ministry of Municipal Affairs
Ministry of Natural Resources and Forestry
Ministry of Heritage, Sport, Tourism, and Culture Industries
Ministry of Transportation
Niagara Escarpment Commission
Ontario Provincial Police
Local Agencies
Credit Valley Conservation
Conseil scolaire de district catholique Centre-Sud
Conseil scolaire Viamonde
Dufferin-Peel Catholic District School Board
Peel District School Board
Peel Regional Police
Region of Peel Ambulance Service
Student Transportation of Peel Region

Study Contact List as of May 2021
Toronto and Region Conservation Authority
Town of Caledon
Town of Caledon Fire and Emergency Services
Local Committees
Town of Caledon Active Transportation Task Force
Utilities
Bell Canada
Enbridge Gas Distribution Inc. (Enbridge)
Hydro One / Hydro One Networks Inc. / Hydro One Telecom
Rogers Cable
TransCanada Pipelines Inc.
Trans-Northern Pipelines Inc.
Zayo (formerly Allstream)

The consultation plan is included in Appendix A along with contact information for the above agencies and the indigenous communities listed in Section 5.6. Other stakeholders, interested persons and members of the public are not listed to respect the Municipal Freedom of Information and Protection of Privacy Act.

The implementation and outcome of the public consultation plan is described below.

5.2 Study Notification

Notice of Study Commencement

The Notice of Study Commencement was published in the Caledon Enterprise newspaper on September 7 and 14, 2017. The Region of Peel Twitter account and the project website were also used to inform the public of the Study.

The Notice was mailed to property owners within the Study Area and to indigenous communities, stakeholders, agencies, and organizations on September 6, 2017. The mailing list included property owners with land abutting Airport Road, including up to 300m along intersecting roads, within the Study limits. Notices were also emailed to those who had expressed an interest in the Study or preferred email instead of receiving mail.

The Notice detailed the Study Area and the objectives of the Study. The published Notice and mailed/emailed Notice to property owners invited community members to submit an expression of interest to participate on the Community Working Group. The mailed/emailed Notice to agencies requested that they complete and return a form indicating their preference to stay informed of the ongoing EA.

Correspondence in response to the Notice of Study Commencement was received from several interested parties. Copies of the Notice(s), correspondence, and social media posts are included in Appendix A-1, A-2, and A-3.

Notice of Public Information Centre No. 1

A Notice was issued to invite public comments at the first Public Information Centre during Phase 2 of the Study. Details regarding the Public Information Centre are provided in Section 5.7.2 of this ESR.

The Notice of Public Information Centre was placed in the Caledon Enterprise and Caledon Citizen on May 24 and 31, 2018. The Region's Twitter account and project website were also used to inform the public of the Information Centre. The Notice was mailed/emailed to an updated Study contact list, which included stakeholders, indigenous communities, agencies, organizations and interested persons. The mailing list included property owners with land abutting Airport Road, including up to 300m along intersecting roads, within the Study limits.

All correspondence received in response to this Notice and the Public Information Centre is included in Appendix A-1, A-2, and A-3 and summarized in Section 5.7.2 of this ESR. Copies of the Notice(s) and social media posts are included in Appendix A-1, A-2, and A-3.

Notice of Public Information Centre No. 2

A Notice was issued to invite public comments at the second Public Information Centre during Phase 3 of the Study. Details regarding the Public Information Centre are provided in Section 5.7.2 of this ESR.

The Notice of Public Information Centre was placed in the Caledon Enterprise and Caledon Citizen on September 10 and 17, 2020. The Region's Twitter account and project website were also used to inform the public of the Information Centre. In addition, a mobile sign advertising the Information Centre was placed outside Caledon Town Hall from September 10 to 23, 2020. The Notice was mailed/emailed to an updated Study contact list, which included stakeholders, indigenous communities, agencies, organizations and interested persons.

Due to the alternative design concepts under consideration at the time, the Study mailing list was expanded to include property owners within Caledon East (generally within an area bounded by Mountainview Road to the west, Huntsmill Drive to the north, Innis Lake Road to the east, and Olde Base Line Road to the south), including lands abutting Airport Road and up to 300m along intersecting roads within the Study limits.

All correspondence received in response to this Notice and the Public Information Centre is included in Appendix A-1, A-2, and A-3 and summarized in Section 5.7.2 of this ESR. Copies of the Notice(s) and social media posts are included in Appendix A-1, A-2, and A-3.

Notice of Study Completion

The Notice of Study Completion will be advertised in the Caledon Enterprise and Caledon Citizen on two separate dates each; and mailed/emailed to the updated Study contact list, which will include stakeholders, indigenous communities, agencies, organizations, interested persons, and property owners within Caledon East (including lands abutting Airport Road and up to 300m along intersecting roads within the Study limits). The Notice will summarize the preferred corridor improvements and announce the review period for the ESR. During this time, comments and concerns should be sent directly to the Project Manager at the Region of Peel. In addition, a request may be made to the MECP for an Order requiring a higher level of study (i.e. requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g. require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. The Draft Notice with additional details is provided in Appendix A-1. Upon issue, the final Notice will be retained in the project file.

5.3 Project Website and Updates

A project website was developed to keep the public informed of the Study. Updates to the project website were provided at key stages of the planning and design process, including at Study Commencement, pre and post Public Information Centres, and Study Completion. Community Working Group meeting summaries were also posted to the project website given their objective to represent interests of the community. In addition, four Project Updates were posted to the website between Study milestones in April 2017, July and December 2020, and January 2021. A copy of each Update is included in Appendix A-1.

The project website can viewed at:
https://www.peelregion.ca/pw/transportation/construction/environmental-assessment/airport-road-caledon.asp.

5.4 Social Media

As noted above, the Region of Peel Twitter account was used to inform the public of the Study and Public Information Centres. Correspondence tweeted by the Region and the public is included in Appendix A-1.

5.5 Agency Consultation

5.5.1 Technical Advisory Committee

Technical staff from the Region and relevant agencies were invited to attend Technical Advisory Committee meetings to review and provide feedback on all aspects of the Study.

The Technical Advisory Committee included representatives from the following agencies:

- Credit Valley Conservation
- Ministry of Environment, Conservation and Parks
- Ministry of Natural Resources and Forestry
- Niagara Escarpment Commission
- Region of Peel Project Team
- Toronto and Region Conservation Authority
- Town of Caledon
- Utilities (Bell Canada, Enbridge, Hydro One, Rogers Cable, Trans-Northern Pipelines Inc., Zayo)

Three meetings and two updates were arranged to keep the Technical Advisory Committee informed of the EA and to provide an opportunity for comment:

Project Kick-off Meeting on October 25, 2017 to inform the Region's internal teams and technical agencies of the EA study, exchange relevant information, and discuss key issues.

TAC Meeting No. 1 on April 26, 2018 to provide an update on the EA study (problem/opportunity statement, evaluation of planning alternatives, and preliminary preferred solution), technical findings to date, and information to be shared with the public at the upcoming Community Working Group and public meetings.

TAC Meeting No. 2 on August 20, 2020 to review the technically preferred design concept for improvements to Airport Road and obtain feedback. Due to COVID-19 public health restrictions, the meeting was conducted virtually and a review package (evaluation of alternative design concepts) was circulated in advance.

Email Update No. 1 on September 21, 2020, to clarify the options to be presented at the second Public Information Centre based on consultation with the Community Working Group and Town of Caledon since the last TAC meeting. In summary, the Update explained that the Old Church Road extension would be shown at the Public Information Centre as the preliminary preferred option with alternatives for heritage mitigation. The 3-legged intersection option would be shown at the Information Centre as a sub-option under "Closed Access".

Email Update No. 2 on January 27, 2021, to announce that Old Church Road will not be connected at Ivan Avenue and the ultimate solution for the west leg of the Airport Road and Old Church Road intersection will be subject to the Town of Caledon Urban Design Review for the broader area.

A draft of this ESR was also provided to the Technical Advisory Committee for review and comment.

Questions and comments raised by the Technical Advisory Committee were addressed during meetings and through correspondence as documented in Appendix A-3.

Summary of Technical Advisory Committee Comments

The following comments and discussions were critical to the decision-making process, particularly in areas of the Study corridor where major trade-offs were considered:

Any potential widening could impact the community feel and a reduction in boulevard would impact the pedestrian quality of the corridor.

Widening for additional through traffic lanes was not carried forward as part of the preferred solution. Maintaining two through lanes and improving active transportation infrastructure throughout the corridor will help support the community character and improve the pedestrian environment.

Explore the importance of detouring trucks at King Street through encouragement, as King Street and Olde Base Line Road are the only opportunities to detour trucks before they go through Caledon East.

To balance the needs of goods movement and the local community, this EA considered speed reduction measures on Airport Road to encourage some heavy trucks to use alternative routes to Airport Road through Caledon East.

Consider the appropriateness of extending the Rural Main Street designation between the Mono Road and Caledon East communities.

During the development and assessment of alternatives, the EA considered the concept of urbanizing and connecting active transportation on Airport Road between Mono Road and Caledon East. Among other factors, the distance between community destinations, the surrounding land use, and the complexity and cost of providing storm and other infrastructure resulted in full urbanization as not preferred. However, the section from south of Hilltop Drive to the south limit of Caledon East (south of Cranston Drive) will be urbanized with multi-use paths, and the section from south of Cranston Drive to Olde Base Line Road will be improved with paved shoulders.

Minimize urbanization along the corridor as much as possible as a means of reducing lighting impacts / stormwater management upgrades that contribute to cost.

Urban, rural and semi-urban cross-sections were considered in the evaluation of corridor alternatives. A combination of these cross-sections is proposed.

Request that no environmental features are affected by the large footprints of any roundabouts being considered.

Impacts to natural heritage features were considered in the evaluation of alternatives, including the encroachment of a roundabout into adjacent wetland features at Huntsmill Drive. Considering this and other factors, a roundabout was not proposed at Huntsmill Drive.

Need to meet TRCA stormwater management criteria and appropriately include the cost for stormwater, including property impacts, into the EA.

TRCA's stormwater management criteria was considered and the costs for stormwater are included in this ESR. Costs related to property impacts are not documented in the ESR but are estimated for Capital programming purposes.

Maintain lane widths at 3.5m maximum and minimum, which would reduce speed limits along the road.

Lane widths were reduced to 3.5m for areas outside Caledon East, which transition to areas beyond the Study limits where lane widths are 3.65m to 3.75m. Lane widths were reduced to 3.35m within the downtown core of Caledon East where the right-of-way width is constrained and reduced lane widths would effectively reinforce the surrounding town atmosphere. The area between Hilltop Drive and Mountcrest Road has lane widths of approximately 3.75m which would be maintained to provide space to maneuver within the lane, given the steep grade through this section of the corridor.

Attempts should be made to tie into any proposed active transportation facilities, streetscaping and streetlighting on Old Church Road east of Airport Road.

During the EA, the Study Area was expanded to include active transportation on Old Church Road to the eastern most intersection with Marilyn Street. Within this section, a multi-use path was proposed on the south side of Old Church Road and an improved sidewalk on the north side.

5.5.2 Municipal Agencies

5.5.2.1 Town of Caledon

In addition to the Technical Advisory Committee, separate meetings were held with the Town of Caledon (Town) to review key findings of the EA Study and receive feedback:

- Meeting with multi-disciplinary staff on February 8, 2017 to review identified problems and opportunities, and technical alternative solutions,
- Meeting with planning and development staff on February 16, 2017 to discuss EA considerations,
- Meeting with multi-disciplinary staff on November 20, 2017 to review alternative design concepts,
- Discussion with senior management in January 2019 regarding alternative design concepts, and
- Meeting with multi-disciplinary staff on August 14, 2020 to review the preliminary preferred design concept for public review.

Meeting minutes are included in Appendix A-3.

Further, the following draft reports or memorandums were provided to the Town for review and comment:

- Transportation Study
- Old Church Road Extension Traffic Update
- Roundabout Traffic & Safety Assessment and Functional Design Review
- Parking Analysis
- Cultural Heritage Resource Assessment
- Heritage Impact Assessment for 16000 Airport Road

Questions and comments raised by the Town were addressed during meetings and through correspondence as documented in Appendix A-3.

Summary of Town of Caledon Comments

The following comments and discussions were critical to the decision-making process, particularly in areas of the Study corridor where major trade-offs were considered:

Cranston Drive: Roundabout vs Conventional Intersection

Early in the Study, the Town supported the concept of roundabouts as traffic calming alternatives, provided that roundabouts do not prohibit trucks and farm vehicles, and that trucks are not diverted to adjacent Town roads. From a planning and development perspective, the Town also expressed concern that a roundabout at Cranston Drive would conflict with the small town character of Airport Road throughout the balance of Caledon East. The Town's written comments on December 21, 2018, further indicated that a roundabout at Cranston Drive could not be supported from a functional and urban design perspective. The Town's vision includes a pedestrian and cyclist friendly community with a two-lane cross-section.

The Region's policy is to screen intersections where traffic signals and other improvements are warranted for a roundabout. Roundabouts are also considered to slow traffic (including truck traffic). Both roundabouts and conventional intersections were evaluated in the EA to identify preferred solutions at major intersections.

During a follow-up meeting with the Town, the Region clarified that the EA is not recommending widening to accommodate additional through lanes. The Region also noted that:

- Vehicles must stop versus yield to pedestrians at a roundabout, as per recent changes to the Ontario Traffic Manual (OTM), and
- The roundabout option at Cranston Drive would include a mid-block pedestrian crossing or a pedestrian signal at the Caledon East Public School exit contingent on approval of access to area development.

In the end, the Town generally supported a roundabout at Cranston Drive with pedestrian signals at the Caledon East Public School exit.

Mono Road: Traffic Calming

Insufficient corridor space through the Mono Road community limited the planning options for traffic calming. However, speed reduction measures are proposed to slow traffic before entering the community. For example, roundabouts are proposed at intersections in advance of Mono Road and beveled curbs are proposed in the commercial area near Olde Base Line Road.

Other detailed traffic calming measures in Mono Road will be confirmed during the detailed design phase in consultation with the Town of Caledon. Examples of detailed measures include pavement markings, flashing "slow" signs or radar speed signs. Visual cues will also be considered to provide friction (e.g., coloured paved shoulders between Castlederg Side Road and Mono Road).

Mono Road to Caledon East: Rural vs Urban Cross-section

Urbanizing Airport Road from Olde Base Line Road to Cranston Drive was initially considered to link the communities of Mono Road and Caledon East with active transportation (e.g., multi-use path on one or both sides). In their written comments (December 2018), the Town indicated support for multi-use paths, and preferably on the west side of Airport Road, where heritage properties toward Olde Base Line Road have a greater setback from the road.

After further review, urbanizing this section of Airport Road did not show as preferred among alternatives, partly due to significant stormwater, additional streetlighting and urbanization cost implications, and the walking distance between rural and urban destinations. Instead, paved shoulders with rumble strips were recommended and presented to the Town as the technically preferred design for the rural area through this section of the corridor. The paved shoulders were recognized as an improvement over existing conditions within the rural area.

Cranston Drive: Two vs One Lane Roundabout

At Cranston Drive, the Town requested an interim or short-term solution of a one-lane roundabout with expansion to two lanes, when warranted. Town Staff subsequently reported to the Town of Caledon

Council on their review of the flared two-lane entry roundabout concept with consideration for traffic operation, safety and the surrounding village context. In summary, the report stated:

"It is anticipated that pedestrian activity at the Cranston intersection will increase significantly with the build-out of the Triple Crown Subdivision. It is well documented that single-lane roundabouts are generally preferable to multi-lane roundabouts near schools because they offer simpler crossings for children. The Caledon East Public School is located northwest of the Cranston Drive/Airport Road intersection.

The two most common crashes at roundabouts are failure to yield and improper lane use, which are both more frequent at multi-lane roundabouts. Single-lane roundabouts are relatively straight-forward for drivers to understand and travel through to their destination. Multi-lane roundabouts add another dynamic with lane choices and short weaving distances. This is evident when comparing the multi-lane roundabouts on King Street in Bolton to the single-lane roundabout on Olde Base Line at Dixie Road.

The roundabout at Cranston Drive is also intended to serve as a traffic calming measure for vehicles and heavy trucks entering and leaving the village core. A two-lane roundabout will increase capacity and therefore encourage higher speeds through the roundabout. This will be counterproductive from a traffic calming perspective compared to a one-lane roundabout."

The traffic study shows that a one-lane roundabout marginally does not work by the year 2031, and the two-lane (flared entry) roundabout is needed by 2041. From an operational perspective, implementing a one-lane roundabout in the interim will have some risk to the Region in that widening for a two-lane roundabout may be required in five to seven years. The Region must factor in the potential for additional cost and disruption to the corridor from two closely scheduled construction periods.

The Region believes it is too early in the process to determine whether to build an interim one-lane roundabout until such time the two-lane (flared-entry) roundabout is needed. The level of risk to the Region is dependant on whether development is anticipated to generate the traffic forecasted by 2031 or 2041. Other factors, such as the current Pandemic, may also impact future travel patterns in a way that has yet to be determined. The Region will determine the phasing of works during the detailed design phase, when the anticipated timing of forecasted traffic volumes will be better understood.

The EA will protect for the two-lane (flared-entry) roundabout and the Region will meet with the Town during detailed design to discuss proceeding with one or two lanes at that time. Up to 2041, the operation of a one-lane roundabout (if phased-in) may need to be revisited and may require widening to a two-lane (flared entry) roundabout to convey traffic through Caledon East.

Hilltop Drive to Caledon Trailway: 3.75m vs reduced lane widths

The section of Airport Road between Hilltop Drive and Mountcrest Road has lane widths of approximately 3.75m from the raised curbs. The Town requested further reduction in the lane widths to

encourage slower speeds and to be consistent with the downtown core. Due to the steep grade within this highly constrained section of the corridor, the EA recommends 3.75m lane widths to provide space for vehicles to maneuver within the lane, particularly during snow conditions.

Caledon East: Parking vs Active Transportation

The Town noted that parallel parking is important for businesses, can be a traffic calming measure and is an integral part of the streetscape. The business, traffic calming and streetscaping effects of parking were incorporated into the evaluation of alternative designs for the road segment between the Caledon Trailway and Walker Road. In addition, a parking study (Section 3) was completed to inform the evaluation.

The Town's written comments (December 2018) indicated that removal of parking on one side of the road to accommodate other elements, such as active transportation infrastructure, could not be supported. Although each alternative would impact some parking, the preferred alternative does not remove all parking on one side of the road.

The Project Team reviewed the Town's suggested option for the placement of a bike lane between the sidewalk and on-street parking. This option was not feasible due to right-of-way width constraints and the potential for significant impacts to existing on-street parking.

Old Church Road: Urban Design vs Road Extension

The extension of Old Church Road to Ivan Avenue was considered as an alternative design solution to address safety concerns associated with the west leg (private driveway access) of the Airport Road and Old Church Road intersection. The Town's written comments on December 21, 2018, indicated that the road extension option could not be supported as it would require the demolition of the building at 16000 Airport Road, which is currently of heritage value to the Town.

Approaches to mitigate potential impacts were discussed with the Town in January 2019, such as proceeding with do nothing or signalizing the driveway with protection for the road extension subject to a condition for future re-development of multiple properties as one parcel.

In the end, the Town generally agreed the preferred road extension option was the most effective solution to address ongoing safety concerns at the intersection and should therefore be considered at the present time. However, the heritage impact was an outstanding issue and the potential to salvage heritage features was discussed.

Following the discussion, the Town advised the Region to complete a Heritage Impact Assessment for 16000 Airport Road to inform decisions regarding heritage mitigation. The Region completed the Heritage Impact Assessment in November 2019 as described in Section 8 of this ESR. The Heritage Impact Assessment was provided to the Town for their review and comment.

In March 2020, the evaluation of alternatives was expanded to include additional options at Old Church Road, taking into account the Heritage Impact Assessment recommendations and consultation with the Town. The detailed evaluation and outcome for the Old Church Road intersection was subsequently provided to the Town, which indicated support for the road extension.

During a follow-up meeting in August 2020, the Region committed to further exploring mitigation options with the Town, such as relocation rather than removal of the heritage building if a suitable site was available. Subsequent discussions confirmed the Town's support to present the Old Church Road extension as the preliminary preferred design concept to the public at Public Information Centre No. 2 (with mitigation options to be confirmed).

Following the Public Information Centre, the Heritage Impact Assessment was presented to the Town's heritage advisory committee (Heritage Caledon Committee). The Town and Region worked together to address comments from the Committee and the public. The extension of Old Church Road was reconsidered and the Town committed to undertaking a separate urban design review study for the broader area. With public consultation and heritage considerations included in the scope, the urban design review study will inform the ultimate configuration at the Old Church Road intersection (i.e. possible future private access options for the west leg of the intersection). As a result, this EA does not recommend that Old Church Road connect at Ivan Avenue.

Walker Road: Controlled Pedestrian Crossing vs Traffic Signals

Traffic signals are not warranted from an operational or safety perspective at the Walker Road intersection. A pedestrian crossing is proposed at this intersection, however the type of controlled crossing (pedestrian crossover (PXO) or intersection pedestrian signal (IPS)) will be determined during detailed design in consultation with the Town of Caledon. To assist in identifying the appropriate controlled crossing type, the Region will continue to monitor pedestrian and vehicular activities at this intersection as a result of anticipated development in the area.

Walker Road: Add vs Remove Proposed Southbound Right Turn Lane

The southbound right-turn lane at Walker Road was initially proposed as it may provide a safety benefit to southbound traffic. The Town requested the right-turn lane be removed from the EA to further improve safety by reducing the crossing distance for pedestrians and encouraging slower speeds. This request was accommodated.

5.5.2.2 Town of Caledon Active Transportation Task Force

The Region presented the Class EA Study to the Town of Caledon's Active Transportation Task Force on October 16, 2020. The presentation focused on proposed active transportation improvements through the Study corridor. Discussions noted the following:

Reconsider use of the existing boardwalk for the signed cycling detour at Mountcrest Road.

The proposed multi-use path north of Mountcrest Road will cross Airport Road at the Caledon Trailway and instead continue south to connect to Mountcrest Road on the east side.

Location of signs and hydro poles could create issues at implementation.

Existing hydro poles will remain on the east side of Airport Road through the downtown core of Caledon East.

Trees between the sidewalk and road could become obstructions.

The type and size of trees or planters will be further reviewed during detailed design. Opportunities to plant trees are challenging and limited within the 20m right-of-way through Caledon East.

North of Huntsmill Drive, there is no signal crossing to connect to a planned future trail.

Providing for a future trail crossing at Huntsmill Drive is not part of the EA scope. The type of crossing at this location will be considered as part of the Town of Caledon's plans for the future trail.

A copy of the presentation slides is included in Appendix A-3.

5.5.2.3 Heritage Caledon Committee

The Region and ASI provided an overview of the Heritage Impact Assessment to the Caledon Heritage Committee on December 7, 2020. The Heritage Impact Assessment report was also included in the agenda for the Committee's review in advance. Feedback focused on the importance of the heritage building in the village core and preference to retain rather than remove or relocate the building. Questions focused on alternatives that would retain the structure at or close to where it is currently situated. A copy of the presentation slides is included in Appendix A-3.

5.5.2.4 Town of Caledon Council

Prior to filing this ESR, Town Staff prepared a report to Town of Caledon Council that confirmed their general support for the EA. The Staff Report further outlined some additional items for the Region to consider during the detailed design phase of the project. A copy of the Town of Caledon report is included in Appendix A-3 and the resulting commitments for detailed design are included in Section 9 of this ESR.

The Region was invited to give an online presentation to the General Committee of Town of Caledon Council on March 23, 2021 to supplement the report. CWG members were informed of the agenda and could view the presentation by livestream on the Town of Caledon's website. A copy of the presentation slides is included in Appendix A-3.

The report recommendations were subsequently submitted to Regional Council for receipt on April 8, 2021. The correspondence and minutes of the Regional Council meeting are included in Appendix A-3.

5.5.3 Provincial Agencies

5.5.3.1 Ministry of Agriculture, Food and Rural Affairs

In June 2018, a representative from the Ministry of Agriculture, Food and Rural Affairs inquired about the Class EA Study. The following was noted for consideration:

- Farm field access locations are indicators of the road being used by farm vehicles and machinery.
- Drainage (e.g., tiles that drain agricultural fields) are indicators of farming activity.
- Timing of road construction and detours should consider avoiding the peak agricultural planning and harvesting season.

Potential agricultural impacts were incorporated in the evaluation of alternatives. Design alternatives considered space for farm vehicles and machinery within rural sections of the corridor.

5.5.3.2 Ministry of Heritage, Sport, Tourism and Culture Industries

The interest in this Study for the Ministry of Heritage, Sport, Tourism, and Culture Industries is related to conserving Ontario's cultural heritage, including archaeological, built heritage and cultural heritage resources. The Stage 1 Archaeological Assessment report was submitted to and accepted by the Ministry for entry into their archaeological register. A copy of the Ministry's clearance letter is included in Appendix G.

The Cultural Heritage Resource and Heritage Impact Assessment reports were forwarded to the Ministry.

5.5.3.3 Ministry of Natural Resources and Forestry

In addition to the Technical Advisory Committee, a site visit was conducted on March 20, 2018, with representatives from the Ministry of Natural Resources and Forestry (MNRF), TRCA, IBI, RiverStone and the Region. The purpose of the site visit was to review the existing natural environment conditions in the Study Area, and to discuss environmental constraints and regulatory requirements. Watercourse features and Crossings 1, 2 and 3 were discussed.

Another meeting with MNRF was held on May 8, 2018, following the first Technical Advisory Committee meeting. The purpose of the meeting was to review the information prepared for upcoming meetings with the Community Working Group and public.

Furthermore, the draft Natural Environment Existing Conditions Report, Natural Environment Impacts Assessment Report, and Tree Inventory and Preservation Plan were forwarded to the Ministry for review and comment.

Questions and comments raised by the MNRF were addressed during meetings and through correspondence as documented in Appendix A-3.

Summary of MNRF Comments

The following comments are highlighted as key areas of interest to the Ministry:

Design to avoid tree clearing in the forested area at Huntsmill Drive

The proposed improvements at Huntsmill Drive avoid potential impacts to the forested area and potential bat communities.

If a replacement culvert is proposed north of Huntsmill Drive, then an open footed structure for fish passage should be considered and the alignment of the culvert should be shifted to the direction of the flow

The existing culvert north of Huntsmill Drive will be removed and replaced with an open footing culvert. The structure will be constructed perpendicular to the roadway alignment.

Consider extending the 50km/h posted speed limit north of Huntsmill Drive to avoid collisions with wildlife crossing the road

It is noted that traffic is exceeding the posted 50km/h speed limit to the south of Huntsmill Drive despite signage and bylaws. Traffic calming measures, such as raised centre medians, are proposed at Huntsmill Drive to effectively encourage slower speeds of traffic approaching the intersection from north of Huntsmill Drive. In response to public comments, the Region will complete a separate speed limit review for a section of Airport Road further north of Huntsmill Drive. The review will be completed following conclusion of the EA so that the recommended improvements at Huntsmill Drive can be factored into the review.

No species at risk concerns for this project

Barn swallows were observed foraging over the Study Area and bobolink was observed near (outside) the Study Area.

5.5.3.4 Conservation Authorities

In addition to the Technical Advisory Committee, a site visit was conducted on March 9, 2018 with representatives from the TRCA, CVC, IBI, RiverStone and Region. The purpose of the site visit was to review the existing natural environment conditions in the Study Area, and discuss environmental

constraints and regulatory requirements. Watercourse features (west of Airport Road, south of Olde Base Line Road) and Crossings 1, 2 and 3 were discussed. TRCA also attended the site visit with MNRF on March 20, 2018.

Further, several draft technical reports were circulated to the TRCA and CVC for review and comment, including:

- Natural Environment Existing Conditions (completed by TRCA and reviewed by TRCA and CVC)
- Natural Environment Impact Assessment
- Tree Inventory and Preservation Plan
- Stormwater Management
- Hydrogeological Assessment

Questions and comments raised by TRCA and CVC were addressed during meetings and through correspondence as documented in Appendix A-3.

Summary of Conservation Authorities' Comments

The following comments are highlighted as key areas of interest to the TRCA and CVC:

CVC identified an additional watercourse crossing under its jurisdiction, approximately 245m south of Olde Base Line Road between Crossings 4 and 5.

This watercourse crossing was added to the EA.

Some culverts do not meet the hydraulic criteria but cannot be upsized due to profile restrictions. TRCA Staff expect that the water surface elevations upstream and downstream of those culverts be maintained consistent with existing conditions.

Although hydraulically deficient, Culvert C2 (

Figure 11) was maintained in the proposed condition due to road profile constraints. Culverts C3 and C7 were upsized in the proposed condition, however, due to road profile constraints, they could not be upsized enough to meet freeboard requirements. Despite these deficiencies, all three culverts see a decrease in Regional water surface elevations in the proposed condition when compared to existing.

5.5.4 Federal Agencies

Correspondence from the Canadian Environmental Assessment Agency dated May 28, 2018 informed the Region that federal reviews under the Canadian Environmental Assessment Act (CEAA, 2012):

- Focus on projects that have a potential to cause significant adverse environmental effects in areas of federal jurisdiction, and
- Apply to physical activities described in the Regulations Designating Physical Activities.

The Agency advised the Region that this project does not appear to be described in the Regulations. Based on review of CEAA (2012) requirements, this project does not appear to be subject to a federal environmental assessment.

Correspondence from Transport Canada dated September 21, 2017 advised the Region to self-asses if the project will:

- Interact with a federal property and/or waterway, or
- Require approval and/or authorization under an Act administered by Transport Canada.

Based on review of the Directory of Federal Real Property and relevant Acts administered by Transport Canada, this project does not appear to be of Federal interest.

5.6 Indigenous Consultation

The Crown has a legal duty to consult indigenous communities when it has knowledge, real or constructive, of the existence or potential existence of an indigenous or treaty right and contemplates conduct that may adversely impact that right. For this project, the MECP had delegated the procedural aspects of rights-based consultation to the Region.

The following indigenous communities were notified as per the Region's mailing list and advice from the MECP:

- Haudenosaunee Confederacy Development Institute
- The Metis Nation of Ontario and Credit River Metis Council
- Curve Lake First Nation
- Mississaugas of Scugog Island First Nation
- Chippewas of Georgina Island, Georgina Island Administration Office
- Alderville First Nation
- Mississaugas of the Credit First Nation

In their letter dated February 9, 2018, the MECP advised that local indigenous communities are unlikely to be interested in this project. Nevertheless, it was recommended that the Mississaugas of the Credit First Nation (MCFN) be sent a project notification. In response, the Region added the MCFN to the study contact list and mailed a Notice for Public Information Centre No. 1 on May 18, 2018.

All communication with indigenous communities was recorded in a communications log. Indigenous communities were mailed copies of project notices. Following the mail-out of notices, a follow-up phone call was made to each of the communities to ensure receipt of the Notice and opportunity for comment. The communications log is included in Appendix A-2.

Through work on the Stage 1 archaeological assessment, it was understood that the Huron-Wendat First Nation and MCFN have protocols or interest in reviewing Stage 1 archaeological assessments. These First Nations were sent an email asking if they preferred to view the Stage 1 archaeological report. Both communities requested copies of the report, which were sent on March 8, 2019.

On March 8, 2019, the Huron-Wendat First Nation noted receipt of the report and that they would like to receive a copy of any subsequent stages of the archaeological reports. The Huron-Wendat First Nation asked to be informed in the event of any indigenous material being encountered in the next phases of the project. This correspondence is included in Appendix A-2.

On April 1, 2019, the MCFN confirmed that they had no concerns on the Stage 1 archaeological report and noted that the MCFN's Field Liaison Representatives are required on location should a Stage 2 archaeological assessment take place. This correspondence is included in Appendix A-2.

5.7 Public Consultation

5.7.1 Community Working Group

The Notice of Study Commencement invited the public to submit an expression of interest to the Project Team to become a member of the Community Working Group (CWG). Fifteen (15) CWG members were selected to provide a cross-section of interests, with various knowledge and a broad set of skills.

The purpose of the CWG was to help the Project Team develop a solution for the Study Area that met the needs of all stakeholders. CWG members represented farm, residential and business owners, senior residents, long-time residents, residents with strong understanding of the Study Area, and residents who had interests in local issues. All other interested members of the public were invited to participate in future opportunities for public comment.

The CWG had no voting status and made recommendations to the Project Team, who in turn made decisions based on the EA process. CWG members also served as Ambassadors of the Study and liaised with community members for input. However, it was noted that the personal viewpoints of CWG members did not represent the viewpoint of the CWG as a whole.

CWG Orientation Session

An orientation session was held on November 30, 2017, at the Caledon Community Complex in Caledon East. At this session, the CWG roles and responsibilities were explained. Members were introduced to the Airport Road Class EA, as the Project Team outlined the study purpose, background, transportation issues in the Study Area, and the EA process. Open discussion took place and the Project Team addressed members' questions. The CWG orientation meeting notes are included in Appendix A-1.

CWG Meeting No. 1

The first meeting of the CWG was held on May 17, 2018, at the Caledon Community Complex in Caledon East. The purpose of the meeting was to share the information to be presented to the public at the first Public Information Centre (PIC), scheduled for June 4, 2018. The Project Team reviewed the PIC information with the CWG and addressed their questions. Notes of the CWG meeting are included in Appendix A-1.

CWG Walking Audit

In November 2018, members of the CWG participated in Peel Public Health's walking audit program. The purpose of the program is to:

- Engage community residents in local planning,
- Influence the built and natural environment through a formal feedback process, and
- Improve walkability.

For the purpose of this EA Study, the walking audit conducted on Airport Road and Old Church Road is referred to as the Neighbourhood Walk. The Neighbourhood Walk took place on Saturday, November 17, 2018. The walking route included Airport Road from north of Larry Street (Emma Street) to Walker Road, and Old Church Road from Airport Road to the Caledon Community Centre Complex. The Peel Public Health team facilitated the walk, which gave CWG the opportunity to identify areas of concern and to point out what seemed to work well from a walkability perspective.

Following the walk, the CWG completed a survey to determine the overall walking audit score for the neighbourhood. At the end of the session, the Public Health team reported that the overall walking audit score was 66% which indicated that the neighbourhood is walkable, but some improvements could be made.

A workshop with a mapping exercise and facilitated discussion followed. During the group discussion, CWG members noted locations which they felt required improvements or were of concern. Members also noted locations that they felt were not in need of improvement and were working well and enjoyed by the community. In the end, recommendations were to:

Maintain sidewalks with curb ramps.

The design alternatives in the EA maintained curb ramps (depressed curbs) at intersections with sidewalks or multi-use paths and tactile walking surface indicators per AODA standards.

Maintain sidewalks on both sides of the street.

The design alternatives considered pedestrian facilities on both sides of Airport Road through Caledon East.

Reduce distance between intersections.

Controlled pedestrian crossings are proposed between Cranston Drive and Hilltop Drive and at Walker Road.

Improve sidewalks with uneven pavement.

Uneven surfaces will be addressed during construction of the proposed improvements.

Separate sidewalks from street traffic.

Separation between pedestrians, cyclists and motorized vehicles were factored into the evaluation of design alternatives.

Clear snow on walkways.

This recommendation will be forwarded to the Region's Roads Operations and Maintenance team.

The audit results are detailed in the **Neighbourhood Walk Report** in Appendix A-1.

CWG Meeting No. 2

The second meeting of the CWG was held virtually on September 15, 2020, using Microsoft Teams. The purpose of the meeting was to share the information to be presented to the public at the second PIC, scheduled for September 23, 2020; and to review the results of a pilot survey. The Project Team reviewed the information with the CWG and addressed their questions. Notes of the CWG meeting and presentation, including a summary of the pilot survey results, are included in **Appendix A-1**.

Summary of CWG Comments

The following concerns or suggestions are highlighted as key areas of interest to the CWG:

Potential negative impacts of the traffic analysis on the community.

Technical recommendations were refined during the EA process based on additional assessment of potential natural, social, cultural and economic impacts.

Technical information concerning traffic and truck volumes within the corridor (concerns related to high vehicular speeds, including transport trucks speeding downhill).

The Transportation Study and Noise Assessment reports were circulated to the CWG in advance of public review.

Road safety given increased traffic and goods movement (e.g., drivers and pedestrians, particularly seniors who experience difficulty crossing the road).

Safety, age-friendly and accessibility criteria were factored into the evaluation of design alternatives.

Suggestions for Airport Road between Cranston Drive and Huntsmill Drive.

This section will be enhanced with improved active transportation features.

Possible roundabout at Cranston Drive (e.g., pedestrian safety, traffic gap when turning onto Airport Road, and justification for a two lane roundabout).

The roundabout option at Cranston Drive was considered in combination with a midblock controlled pedestrian crossing between Cranston Drive and Hilltop Drive. The roundabout will contribute to speed reduction though this section of the corridor. The proposed two-lane flared entry roundabout design will address both future capacity constraints and speed reduction.

Traffic calming measures between Mono Road community and Cranston Drive.

The roundabouts proposed at Boston Mills Road to the south and Cranston Drive to the north are expected to slow traffic through this section of the corridor. In addition, beveled curbs are proposed in commercial areas near Olde Base Line Road.

Additional detailed traffic calming measures near Mono Road, such as pavement markings and radar speed signs, will be confirmed during detailed design in consultation with the Town of Caledon.

Concern for rural cross-section between Mono Road community and Cranston Drive.

Urbanizing this section was difficult to justify because of the high cost to accommodate active transportation infrastructure with a long stretch of new storm sewers, boulevards and utility relocations.

The section between Olde Base Line Road and Cranston Drive is outside the existing urban boundary with adjacent rural land uses and no current plans for development. Urbanization could be implemented as a condition of future development if or when the urban boundary is expanded.

Furthermore, the walking distance is beyond 1km from Olde Base Line Road to major destinations north of Cranston Drive (e.g., school, Plaza and active development).

It is noted that urbanization with multi-use paths will extend from north to immediately south of the Cranston Drive intersection. The proposed paved shoulders with rumble strips south of Cranston Drive to the Mono Road community are an improvement over the existing conditions.

Safety at Airport Road and Old Church Road (with interest in having the surrounding lands redeveloped).

Based on public and agency consultation, the extension of Old Church Road to address safety issues related to the west leg (driveway access) of this intersection was reconsidered. The Town of Caledon will undertake a separate urban design review study for the broader area.

With public consultation and heritage considerations included in the scope, the study will inform the ultimate configuration for the west leg of the intersection at Old Church Road (i.e., possible future private access options). As a result, this EA does not recommend that Old Church Road connect at Ivan Avenue.

The Project Team provided regular updates to the CWG to keep members informed of the EA and to provide an opportunity for comment. On January 27, 2021, an email update was provided to the CWG to announce that Old Church Road will not be connected at Ivan Avenue and the ultimate solution for the west leg of the Airport Road and Old Church Road intersection will be subject to the Town of Caledon Urban Design Review for the broader area.

Right turn lane justification (e.g., removing proposed right-turn lanes to encourage slower speeds and reduce impacts to property and access).

The proposed southbound right-turn lane at Walker Road was removed from the preferred design to reduce the crossing distance for pedestrians and encourage slower southbound traffic speeds. The semi-urban design combined with reduced lane widths immediately north of this intersection will mitigate property impact and encourage slower speeds.

Fully urbanize Airport Road from Walker Road to Leamster Trail with curb, boulevards, sidewalks, multi-use path, landscape, and lighting.

Of the alternatives considered, the EA recommended a semi-urban cross-section from Walker Road to Leamster Trail. The west side of Airport Road between Walker Road and Leamster Trail is recommended to be urbanized with multi-use path. Landscaping and streetlighting will also be considered on the west side during detailed design. The EA recommends paved shoulders on the east side and raised medians between Walker Road and Leamster Trail.

Consider a pedestrian crossover at Huntsmill Drive to connect the future Caledon East Community Trail on both sides of the road.

A crossover can be considered in the Town of Caledon's trail development (separate from this EA).

Potential for road widening in the future.

The Region of Peel's LRTP (2019) and this EA do not recommend major road widening to the 2041 horizon year. However, the Regional Official Plan will continue to protect for potential future widening beyond 2041.

Noise and pollution (e.g., transport trucks roaring uphill).

The Noise Assessment report was circulated to the CWG in advance of public review.

Environmental impacts.

Potential impacts to the natural environment were factored into the evaluation of alternative solutions and designs.

5.7.2 Public Information Centres

Two Public Information Centres (PICs) were held to invite public comments at key stages of the EA Study.

Public Information Centre No.1

PIC No. 1 was held on June 4, 2018 at the Caledon Community Centre in Caledon East from 6:00 to 8:00 p.m. Over 60 people attended the event. The PIC presented the purpose of the Study, an overview of the existing conditions, problems and opportunities, traffic analysis, the draft problem and opportunity statement, evaluation of alternative solutions, preliminary recommended solution, and considerations for design alternatives.

Project information was presented on display boards which were arranged around the meeting room. An aerial roll plan of the Study Area was also displayed in the centre of the room. Participants were able to make comments on the aerial roll plan by writing directly on it or by placing written sticky notes on it as well as on the display boards. Comment sheets were also available for participants to complete and drop into the Comment Box, or mail or fax to the Project Team, as preferred. The information on display boards and aerial roll plan were uploaded to the project website on June 5, 2018.

Public Information Centre No. 2

Due to COVID-19 public health restrictions, PIC No. 2 was conducted online in three parts:

Part 1: Review and Comment Period

The following project information was available on the project website for public review and comment from September 17 to October 14:

- Summary of Community Input

- Summary of Technical Study Findings
- Olde Base Line Road Feasibility Study
- Preliminary Assessment of Alternative Design Concepts for Corridor Sections and Major Intersections, including Evaluation Criteria
- Preliminary Preferred Design for the Study corridor, including Old Church Road
- Roundabout Design Peer Review
- Structural Design for the Centreville Creek Crossing

A comment sheet was available on the project website for participants to complete and email, mail or fax to the Project Team by October 14, 2020.

Part 2: Live Session

The public was invited to join a live online session to hear more about the preliminary preferred design concept and to ask questions or provide comments to the Project Team. The session was held online using Microsoft Teams on September 23, 2020 from 6:00 to 8:00 p.m. A link to the event was posted on the project website and participants could join online (using their computer or mobile phone) or call-in. Over 48 people signed into the session.

Questions and comments were submitted anonymously during the live event through a 'chat' feature in Microsoft Teams. Project Team members answered most of the questions verbally during the live session. The presentation slides for the live session and summary of all questions and answers were subsequently posted to the project website and are included in Appendix A-1.

Part 3: Survey

A link to an online survey was posted to the project website on September 18, 2020. The survey was available from September 18 until October 28. Fifty (50) survey responses were received. The survey questions and responses are included in Appendix A-1.

Closed-ended questions focused on whether respondents agreed or disagreed with the preliminary preferred options for corridor sections and intersections within the Study limits. Open-ended questions focused on the rationale for support or non-support of the alternatives.

Based on the survey results, participants generally agreed with the preliminary preferred design along the Airport Road corridor. The one exception was the recommended improvements at the intersection of Old Church Road and Airport Road (30% agreed, 70% disagreed).

Below is a summary of the feedback received on the recommended improvements for the Old Church Road intersection (at the time, the recommended improvements included a road extension to Ivan Avenue):

- Concern regarding potential increase in traffic on residential streets
- Concern that the improvements will decrease property values
- Concern that the improvements will change the character of the neighbourhood
- Concern for pedestrian safety due to lack of sidewalk on Ivan Avenue and Oliver's Lane
- Suggestion to avoid impacting the cultural heritage resource at 16000 Airport Road
- Request for information on potential locations the LCBO may be relocated to
- Concern regarding potential increase in noise
- Request for more information

Some of the feedback included suggestions on alternate options. These suggestions included:

- Close the Airport Road access at 16000 Airport Road and maintain Ivan Avenue access
- Close the Ivan Avenue access at 16000 Airport Road and maintain Airport Road access
- Install a four-phase traffic signal at the intersection
- Signalize the intersection of Walker Road and Airport Road

Outside of Old Church Road, agree rates were high and ranged from 72.97% to 88.89%. Of the improvements proposed, participants most agreed with the intersection improvements at Huntsmill Drive (88.89% agreed, 11.11% disagreed).

Summary of PIC Comments

Questions and comments raised by the public were addressed during the PICs and through correspondence as documented in Appendix A-1. The key messages heard at the PICs were related to traffic, intersections, road safety, beautification, parking, roundabouts, and the preliminary preferred design. The input received through the PICs is summarized by topic below.

Comments	Response in the EA
Traffic	
Timing of signals along the corridor result in large queues at afternoon peak times, especially holiday weekends	Traffic operations at all intersections were reviewed in the Transportation Study. Needs and feasibility of improvements were incorporated into recommendations.
Difficulty turning left or right onto Airport Road during the morning and evening rush and weekends	For unsignalized side-street access to Airport Road, alternative routes for traffic to enter Airport Road via a signalized intersection were considered. The gradient and lack of turning lanes at Larry Street was identified as a safety concern. However, lack of space within the available right-of-way restricts opportunities for improvements such as left turn lanes at this location. Having an alternative route to signalized access would provide for a protected movement. The road extension option at Old Church Road was considered to provide a signalized egress for the immediate neighbourhood that is currently using Emma Street, Parsons Avenue or the private driveway at the LCBO to access Airport Road. However, neighbourhood concerns for cut-through traffic as a result of a road extension outweighed the benefits of providing an alternate signalized egress to Airport Road. For side-street access at major intersections (signalized or unsignalized), a combination of turn lanes and roundabouts are proposed. The Cranston Drive improvements are expected to provide an alternative egress path to traffic on Larry Street, Hilltop Drive and Marion Street.
Concern for additional traffic capacity (major road widening) Widen Airport Road from King Street northly or to Olde Base Line Road	The 2015 Caledon East (Network) Study identified that there is sufficient capacity along Airport Road in Caledon East (the existing condition) to accommodate demand within a 20 year horizon, although with localized congestion. Further, the 2019 LRTP and this EA do not recommend major road widening of Airport Road from King Street to Olde Base Line Road or Huntsmill Drive to the year 2041. Through the Official Plan, the Region will continue to protect the corridor for potential needs up to and beyond 2041. North of Olde Base Line Road, sections exist where widening is not feasible without significant impacts to adjacent property. Modal shifts from vehicles to active transportation, and ways to improve multi-modal uses through the corridor, were considered. It was determined that road widening for additional traffic lanes was not required within the Study Area and instead localized widening may take place at intersections to accommodate improvements. In keeping with the Caledon East Community Improvement Plan, passive measures such as traffic calming, and encouraging some truck traffic to use other routes, were included as part of the preferred solution.
Bypass the Mono Road community or Caledon East Consider that traffic be reduced to local residents and service only Divert truck traffic	In 2015, the Region assessed the feasibility of a new bypass around Caledon East as part of the Goods Movement Strategic Plan. Constructing a new bypass was not carried forward primarily due to significant impacts on property, natural environment, and cost. As an alternative, Olde Base Line Road was identified as a potential east-west route for a portion of trucks travelling northwest via Airport Road and Charleston Side Road. Speed reduction measures such as signage and roundabouts were recommended to slow traffic and encourage some of the truck traffic to use other existing routes (e.g., King Street and Highway 10). The current EA study is looking to slow traffic on Airport Road through Caledon East. In conjunction with the EA, the Region has also examined the potential to upgrade Olde Base Line Road to accommodate trucks. Several other measures are proposed that support the village character of Caledon East while maintaining the current arterial function of Airport Road, such as improved sidewalk and multi-use path, pedestrian crossing and/or cross-rides at intersections, and layby parking with streetscaping. Given that the construction of a bypass for the entirety of Caledon East (which has significantly more population/employment than Mono

Comments	Response in the EA
	Road) was not carried forward as an option, the benefits of having a bypass that services a smaller population is currently difficult to justify. Airport Road is a designated goods movement corridor and goods movement is vital to the Region's economy; therefore restricting trucks on Airport Road is not planned. However, encouraging some trucks to use other truck routes (e.g., King Street and Highway 10) is an objective of the EA Study, along with improving safety and speed limit compliance.
Add a weigh scale north or south of the village to detract large trucks from using Airport Road	The Region requested a Provincial Mobile Inspection Unit to weigh and examine trucks on Airport Road between Olde Base Line Road and Old Church Road for one day in February 2020. Results of the inspection were not available at the time of preparing this report. The Region will continue to advocate for regular mobile inspection units through the Study corridor.
Concern for truck traffic on Olde Base Line Road Relocate truck route north or south of the Mono Road community	The 2015 Caledon East Feasibility Study identified Olde Base Line Road as a potential alternative east-west route for a portion of trucks travelling northwest on Airport Road through Caledon East and via Charleston Side Road. The Region undertook a feasibility study in conjunction with this EA which determined that, with some upgrades, Olde Base Line Road is generally suitable to accommodate additional truck traffic (approximately 20% of the existing truck traffic on Airport Road). Future planning for Olde Base Line Road will be carried out separate from this EA Study. Potential ways of incorporating traffic calming measures in the road design were examined with the intent of reducing speeds and encouraging some goods movement to use alternative east-west truck routes. Alternative east-west truck routes south of Mono Road and Caledon East, such as King Street, are encouraged for trucks travelling west to Hurontario Street or east to Emil Kolb Parkway.
Limit growth	Growth in this area is already limited by established urban boundaries and the Greenbelt, however these limits do allow growth as currently planned (e.g., current developments). Prohibiting or restricting current developments is not consistent with Region or Town of Caledon plans and policies.
Intersections	
Vehicles turning onto Larry Street from Airport Road block traffic during peak times	For segments with frequent driveways and side-street access (e.g. Mono Road, parts of Caledon East), additional turning lanes or two-way left-turn lanes were considered and found not to be feasible due to right-of-way constraints.
Suggestion to implement a directional traffic light or advanced green for southbound traffic at Old Church Road	The concept of traffic signals with split phasing was evaluated as an alternative design solution.
Suggestion to realign or signalize the LCBO intersection at Old Church Road	The concept of signalizing the LCBO driveway was evaluated as part of the split phasing (with advance green) alternative. Realignment or relocation of the skewed driveway access was not feasible or preferred due to property and utility constraints, and proximity to the intersection.
[Under the road extension option, the new intersection of Old Church Road and Ivan Avenue] would not be beneficial as the amount of speeding cars coming down Ivan Avenue has increased	Following PIC No. 2, the Project Team began examining the option of not connecting the Old Church Road extension at Ivan Avenue to assess and compare this option to the other alternatives considered. An update was provided on the project website in December 2020: https://peelregion.ca/pw/transportation/construction/environmental-assessment/airport-road-caledon.asp. The road extension option was reconsidered based on public and agency consultation. Under the preferred plan, Old Church Road will not connect at Ivan Avenue.
Identified safety concerns due to lack of left turn lane	Need and feasibility for left-turn lanes were assessed as part of the Transportation Study and findings were incorporated into

Comments	Response in the EA
	recommendations.
Suggestions to implement a signalized crosswalk or controlled [traffic] lights	Traffic signals are not warranted from an operational or safety perspective at the Walker Road intersection. A pedestrian crossing is proposed on the south leg of the Walker Road intersection. The type of controlled crossing (PXO or IPS) will be determined during detailed design in consultation with the Town of Caledon. To assist in identifying the appropriate controlled crossing type, the Region will continue to monitor pedestrian and vehicular activities at this intersection as a result of anticipated development in the area.
Road Safety	
Concern for high speeds (speeding vehicles including large noisy trucks)	Speed reduction measures are proposed through the Study corridor, including raised centre medians north of Walker Road and at Huntsmill Drive, layby parking with streetscaping from the Caledon Trailway to Walker Road, beveled curb in commercial areas near Olde Base Line Road, roundabouts at Castlederg Side Road-Boston Mills Road and Cranston Drive; and reduced lane widths throughout most of the corridor.
Suggestions to reduce speed limits, including a change to 60km/h on Airport Road from Castlederg Side Road northerly and from Huntsmill Drive to Patterson Side Road, and to 40km/h within Caledon East. The posted speed limit of 50km/h should start further north of Huntsmill Drive with warning signage in advance and a flashing light at Huntsmill Drive.	Reducing the posted speed limit is typically ineffective at changing operation speeds as physical road characteristics have a much larger impact on driver behavior. Traffic calming measures were investigated with the intent of reducing vehicular speeds. These include a roundabout at Castlederg Side Road; urbanization, reduced lane widths and layby parking in sections through Caledon East; and raised centre medians with reduced lane widths at Huntsmill Drive. The raised medians will provide southbound drivers with a visual cue to slow down before crossing the intersection into Caledon East. Airport Road beyond 300m north of Huntsmill Drive is outside the EA Study Area. However, the Region will complete a separate speed limit review of the road segment north to Patterson Side Road. The review will be completed following conclusion of the EA, so that the recommended improvements within the north Study limit at Huntsmill Drive can be factored into the review. The suggestion for warning signage and flashing light will be forwarded for further consideration during this review,
The somewhat unique characteristics of the 'constrained corridor' zone between Mountcrest and Hilltop will remain problematic as many of the traffic calming measures cannot be implemented in that area. This 300 meter stretch will continue to allow, or encourage, many drivers to increase speed because of a lack of obstacles to deter such behaviour.	Motorists approaching Caledon East from both ends of the corridor would be able to see that they are entering a different urbanized environment, signaling the need to slow down well in advance of Hilltop Drive or Mountcrest Road. Roundabouts are proposed at Castlederg Side Road-Boston Mills Road and Cranston Drive to encourage northbound traffic to slow down before entering Caledon East. The proposed roundabout design ensures that motorists driving straight along Airport Road would be required to decelerate to maneuver around the roundabout regardless of traffic volumes. Vehicles leaving the roundabout would be travelling at significantly reduced speeds compared to the existing conditions. Additional measures are proposed to encourage southbound traffic to slow down on approach to Caledon East, such as raised centre medians at Huntsmill Drive and north of Walker Road. The opportunity for a gateway feature on top of the median at Walker Road and roundabout at Cranston Drive would also help inform drivers that they are entering a pedestrian friendly environment. Reduced lane widths throughout most of the corridor and bulb-out raised curbs in the adjacent Caledon East core are also proposed to encourage slower speeds in this area.
The ASE technology will have an impact, however its effectiveness will be lessened as it will not be in place for long periods of time as the equipment rotates between six sites.	With respect to speed enforcement, Airport Road from Cranston Drive to Huntsmill Drive is one of six selected sites for the Region of Peel Automated Speed Enforcement (ASE) Program (separate from the EA). One ASE camera will be rotated between the six sites (one site at a time). The timeframe for Airport Road had not yet been determined at the time of preparing this report. Updates on the ASE program will be provided on the Region's website at: https://www.peelregion.ca/pw/transportation/residents/automated-speed-enforcement-

Comments	Response in the EA
	program.asp.
Concern for pedestrian and cyclist safety, with suggestions and comments as follows: Improve pedestrian safety by the Caledon East Public School Install a crosswalk or set of lights to help cross Airport Road at the top of the hill near the Foodland Plaza. Concern for only a small buffer of grass between the sidewalk and busy truck barrelling by, between Hilltop Drive and the Caledon Trailway Improve sidewalk conditions Seniors cannot move quickly across intersections Add bike lanes along Airport Road	 Multi-use paths and a controlled pedestrian crossing are proposed on Airport Road near the Caledon East Public School. Multi-use paths are proposed on both sides of Airport Road between the Foodland Plaza and Cranston Drive. A controlled pedestrian crossing (with pushbuttons) is also proposed north of the school exit between the Plaza and Cranston Drive. This will assist pedestrians and cyclists in safely crossing the road. Right-of-way constraints and existing retaining walls present a challenge for active transportation and other road improvements through this section. Practical traffic calming measures throughout the Study corridor were considered with the intent of reducing vehicular speeds. A combination of improved sidewalks and multi-use paths are proposed within the urban area. In the interim, the Region has been monitoring Airport Road in Caledon East as part of an annual inspection program to identify and address sidewalk issues, The Region completed localized spot repairs in 2017 and will continue to monitor this corridor until construction of the improvements proposed by this EA. Pedestrian crossing distances were factored into the evaluation of alternatives and preferred designs at intersections. Also, speed reduction measures were considered through the corridor to improve pedestrian safety. A combination of bike facilities are proposed, including multi-use paths and signed bike route in the urban area and paved shoulders in the rural areas.
Concern for sightlines: At Hilltop Drive Heading south up the hill with concern for sufficient space to stop for pedestrians as drivers crest the hill Heading south due to retaining walls At Emma Street At Parsons Avenue due to large truck parking on the west side of Airport Road, which creates a huge safety issue blocking visibility of oncoming traffic from north Airport Road and those making a left on Old Church Road.	 The high point of the road alignment is closer to Hilltop Drive, which is north of the Foodland plaza exit. The new pedestrian crossing is proposed at a safe distance away from Hilltop Drive, south of the Foodland plaza. Another concern was whether vehicles coming out of the steep hill can see the drivers of oncoming traffic. The team has looked at sightlines and they are appropriate at this location. With the proposed bulb-out design for layby parking, vehicles will have an opportunity to safely come out further into the intersection when leaving Emma Street or Parsons Avenue to see clearly how the southbound traffic is coming before completing this turn.
Beautification	
Suggestions to beautify Caledon East by: Planting more trees along Airport Road	 A tree inventory was completed for areas potentially affected by this EA with recommendations for tree re-planting. Additional trees will

Comments	Response in the EA
	be planted to the extent possible.
Making the streetscape more inviting for residents to walk, run and cycle	Streetscaping is proposed through the downtown core of Caledon East. Project implementation will consider additional opportunities for incorporating elements of the Region's Streetscaping Toolbox Update (2017).
Burying the hydro poles	Based on consultation with utility companies, the option to bury hydro poles was determined to be not feasible due to significantly high cost.
Placing flowers and urns during the various seasons	Trees will be planted to the extent possible and streetscaping is proposed through the downtown core of Caledon East. The suggestion for flowers and urns will be forwarded to the Region's Roads Operations and Maintenance team and Town of Caledon.
Adding more lighting during the holiday seasons and evening hours (not LED), including interest in working and updated lamping (lamp posts) and streetlighting on Airport Road	The Region will replace existing streetlights on Airport Road in Caledon East as they are approaching end of service conditions. The streetlights will be LED. This may include banner poles and flower pots. In summary, the proposed corridor improvements through Caledon East support the beautification of the village by providing: • enhanced streetscaping, • vegetation in the boulevard, • improved sidewalks, • opportunities for gateway features at the proposed roundabout at Cranston Drive and on the proposed raised median north of Walker Road, streetlighting for the rural area south of the Foodland plaza, and rest areas along the corridor.
Parking	
Concern for lack of parking in Caledon East with suggestions to: • Avoid removal of parking	Although some parking will be removed for all alternatives, the preferred alternative retains parking on both sides of Airport Road in Caledon East.
• Repaint spaces/drive entrances along Airport Road from the Caledon Trailway to Walker Road	Pavement markings can be improved at the time of construction.
• Opinion that businesses are struggling due to parking/access	Impacts to commercial parking and access were factored into the evaluation of alternatives. The parking study found that most on-street parking is convenience-based. Mapping indicates off-street business-related parking is present (except one business with no off-street parking and one business with one parking space).
Roundabouts	
Opinion that roundabouts are great, where there is enough room (at Boston Mills-Castlederg Side Road and not at [Olde Base Line Road]); and with an understanding of how to drive through them	A one-lane roundabout is proposed at Airport Road and Castlederg Side Road-Boston Mills Road. A roundabout is not proposed at Olde Base Line Road. Public education programs will focus on informing the public on safely using the roundabouts and the accommodation of all modes, including drivers, cyclists and pedestrians. Studies have found that there are lower traffic speeds and less severe collisions with

Comments	Response in the EA
	roundabouts than signalized intersections.
Suggestion for roundabouts at Olde Base Line Road and Old Church Road	The design of roundabouts on Airport Road would need to accommodate all traffic, including trucks and/or farm vehicles, resulting in a relatively large footprint. A roundabout at Olde Base Line Road and Airport Road was not carried forward primarily due to significant property impacts. Similarly, a roundabout at Old Church Road and Airport Road would have major property impacts compared to the alternatives considered.
Potential for property impacts at the Cranston Drive roundabout	The Region does not anticipate the need for property on the west side of Airport Road at Cranston Drive. The roundabout will be constructed with a multi-use path along the Region of Peel property line, which will result in the removal of trees within the right-of-way at the southwest corner of Airport Road and Cranston Drive. A landscape plan will be developed during detailed design for tree replacements within the Study corridor.
Concern for the impact of roundabouts on access	Roundabouts are not proposed at intersections with direct property access (e.g., Old Church Road and Huntsmill Drive)
Suggestion to not implement a roundabout at Airport Road/Walker Road Consider lights to permit safer pedestrian traffic	A roundabout is not proposed at Airport Road and Walker Road. The Region applies a signal warrant which considers traffic, pedestrians, and safety. Traffic signals are not warranted at Walker Road, however a controlled pedestrian crossing is proposed on the south leg.
Do not underestimate the impact of too many roundabouts for the delay of emergency vehicles. Delays already experienced because of time for volunteer firefighters to get to stations and we don't have a resident ambulance [will be worse].	The roundabouts allow for turning of large vehicles such as fire trucks. The intent of the roundabouts is to help lower speeds that exceed the posted speed limit. Potential capacity or operational issues that could cause unnecessary delay were factored in the roundabout designs (e.g., two-lane flared entry where required). Emergency services will remain on the invitation list to provide input to this Study.
Other Suggestions	
Support economic development	Economic (business and cost) and land use impacts were considered in the evaluation of alternatives. The Town of Caledon urban design study will support the planning vision for Caledon East in addition to informing the design for the west leg of the Old Church Road intersection.
Consider small town feel	Compatibility with existing and designated land uses within the Study Area were factored into the evaluation of alternatives.
Consider wildlife passage and wetlands	Three locations for wildlife (amphibian) crossings were identified during the inventory of existing conditions. Potential impacts to wetlands were factored into the evaluation of alternatives.
Other Concerns	
Property Impacts	Potential property and access impacts were factored into the evaluation of alternatives. The proposed improvements will result in some localized property impacts, such as at interactions.
Flooding Issues (address stormwater management, beaver dams and culvert blockages)	A stormwater management assessment was completed to address stormwater issues related to existing and planned future corridor conditions. Residents' comments (that a beaver living in Centreville Creek (mainly on the east side of Airport Road) is taking down trees almost on a daily basis and water levels are being affected) was forwarded to the Town of Caledon. In consultation with TRCA, the level of sediment in Centreville Creek was not considered to have significant negative impact on flood

Comments	Response in the EA
	conditions.
Noise and air pollution (including increased noise levels and pollution from truck traffic) Noise generated by loaded and overloaded heavy transports and speeding vehicles [between Huntsmill Drive and Mountcrest Road] continues to be a serious concern. The southbound trucks accelerate to climb the hill and about ten percent of northbound trucks employ engine braking. The frequency of such transports is increasing to six days a week and throughout the day and most of the night. With the rapid growth in warehousing to the south this problem will only increase. The efforts to divert such traffic may have some effect but that is certainly an unknown. Suggestion for a buffer north of Walker Road (at the north end of town or in front of the community to Leamster Trail/McKinley) to quieten truck traffic and associated braking coming into Caledon East Rumble strips are a concern as they would generate noise	Noise and air quality assessments were completed to address potential noise and air quality impacts of the proposed corridor improvements. Changes in future sound levels resulting from this project are expected to be small. Noise barriers were investigated at locations in the corridor as illustrated in the Noise Assessment Report in Appendix F and the preferred design in Appendix P. There is one location north of Walker Road (on the east side of Airport Road) where the Region of Peel will be upgrading the existing private noise wall (at the Right-of-Way property line) into a Regional noise wall. Details on the type of noise wall will be confirmed during detailed design. Rumble strips do create some sound, however this effect is a deterrent for drivers who do not drive consistently. Overall, the proposed project has similar air quality impacts as the Future No-Build scenario.
The section of road from Old Base Line Road to Hilltop Drive should not be classified as a "transitional area" as the Village of Caledon East begins just south of the intersection with Cranston Drive, as indicated within the Caledon East Secondary Plan.	The section between Olde Base Line Road and Hilltop Drive was labelled as a transitional area for the purpose of evaluating alternative road designs that transition from rural to urban. This label can be reconsidered during detailed design so that it is not confused with other planning terms or designations. For the purpose of traceability, this label will be retained in the ESR documentation.
Concern for water issues, landscape environment, and past sink hole in front of driveway at Huntsmill Drive	Geotechnical investigations were completed within the Study corridor right-of-way to determine the structure of pavement and type of subgrade soil.
At Huntsmill Drive, placing a raised median is a concern limiting access during winter months.	Road design will follow appropriate standards and maintain access to Huntsmill Drive.
In summary; the proposals are welcome but a review of the effectiveness of the measures should [be] included. Suggest a review in two years after completion.	The Region continually monitors its roads and particular attention will be given following implementation of the proposed changes.

5.7.3 Residents' Petition

On December 24, 2020, the Project Team received a petition with 185 signatures in opposition to the proposed extension of Old Church Road to Ivan Avenue. The petition was received at Regional Council on February 11, 2021.

Feedback indicated that residents "voiced concerns over an increase in traffic particularly considering the new housing development going in on Walkers Road and Mountainview, pedestrian /bike safety of a heavily walked and biked road, increased traffic noise, extensive cut through traffic, environmental concerns, loss of a historic building and no benefit to the abovementioned streets" and that "Pedestrians from many areas, including those beyond the immediate neighbourhood, use Ivan Ave to get to the Trans Canada Trail access point on Olivers Lane, and increased traffic is not only unsafe, but unwelcomed. Walker's Road is the gateway to Airport Road for this community".

The option to extend Old Church Road to Ivan Avenue was re-evaluated based on the petition and consultation with the public and Town of Caledon, and a new plan was identified. Under the new plan, Old Church Road will not be connected at Ivan Avenue. The Town of Caledon will undertake a separate urban design review for the broader area. The Region will continue to work with the Town of Caledon through this Review on possible future private access options at the intersection. Public consultation and heritage mitigation is included in the scope of this future urban design review.

Therefore, the ultimate solution for the west leg of the Airport Road and Old Church Road intersection is subject to the Town of Caledon Urban Design Review. An update in January 2021 was provided on the project website to this effect: https://peelregion.ca/pw/transportation/construction/environmental-assessment/airport-road-caledon.asp.

5.7.4 Property Owners

In addition to mailing Study notices to property owners within the Study Area, the Region reached out to individual property owners as required for permission to enter their land for field work, and to inform of the potential for significant property impacts in advance of Public Information Centres.

Furthermore, information regarding an existing noise wall was requested through the Regional Councillor for communication with a property owner in advance of PIC No. 2. The subject noise wall at the right-of-way property line will be replaced and converted from a privately owned noise wall to a Region owned noise wall in conjunction with Airport Road construction through Caledon East in approximately 2024 or 2025. The information package for the subject noise wall can be found in Appendix A-1.

5.7.5 Developers' Interests

The Region is circulated on active development plans in the Study Area under a separate development planning process. During the time of this EA, commentary included updates on the Class EA Study and

ultimate right-of-way requirements under the Official Plan. Discussions with the Town of Caledon or active developers in this regard were conducted separate and without prejudice to the EA.

5.7.6 Regional Councillors

In addition to mailing Study notices to Regional and Town of Caledon Ward Councillors, Regional Staff reached out to the Regional Councillors of Wards 2, 3 and 4 in advance of each point of public contact. The purpose of the communication was to keep the Councillors informed of the EA and information to be presented to the public. In return, the Councillors kept Regional Staff informed of any public comments on the EA that were communicated through the Councillors' office.

6. ALTERNATIVE SOLUTIONS

During Phase 2 of the Class EA, alternative planning solutions were developed and assessed to address the Problem and Opportunity Statement identified in this ESR:

Airport Road between King Street and Huntsmill Drive is a busy Regional arterial road serving through traffic and goods movement, while also providing access to the communities of Caledon East and Mono Road. Residents and business owners have expressed concerns with through traffic, heavy trucks, and high traffic speeds in the communities. Traffic volumes are expected to increase due to growth and local developments. Limited space is available for road widening. Improvements are required to better accommodate all uses in the corridor such as vehicular traffic, goods movement, walking and cycling, to improve safety and support the local communities.

6.1 Evaluation Criteria

Evaluation criteria was developed to screen and evaluate alternative planning solutions.

Table 13 provides a description of the evaluation criteria.

Table 13: Evaluation Criteria

Criteria	Indicator
Transportation	Ability to address the problem and opportunity
Natural Environment	Potential negative effects on natural features can be avoided or mitigated Provides opportunity to adapt to / mitigate effects of climate change
Social Environment	Consistent with Region of Peel growth management policies Compatible with existing and planned future land uses Consistent with Caledon East Community Improvement Plan Consistent with Region of Peel Sustainable Transportation Strategy Promotes healthy, age-friendly, and accessible environments
Cultural Environment	Potential negative effects on built heritage and cultural heritage landscapes can be avoided or mitigated
Economic Environment	Consistent with Region of Peel Goods Movement Strategic Network Supports economic sustainability, including business and agricultural practices Anticipated cost within financing capacity of the Region of Peel

6.2 Description of Alternative Solutions

Seven alterative planning solutions were considered as part of the Study.

Table 14 outlines the preliminary alternative solutions that were presented at PIC #1. The solutions were presented to obtain public feedback on their suitability to address the Problem and Opportunity Statement.

Table 14: Alternative Solutions

Alterative Solution	Description
Alternative 1: Do Nothing	No improvement to Airport Road.
Alternative 2: Manage Travel Demand	Reduce vehicle trips through programs and policies that encourage walking, cycling, carpooling, and teleworking.
Alternative 3: Improve Traffic Operations	Add traffic calming measures, traffic signal/roundabouts, turning lanes; realign intersections; and improve road geometrics.
Alternative 4: Limit Growth	No future developments within the Study Area.
Alternative 5: Provide for Active Transportation	Add or enhance facilities that accommodate walking and cycling.
Alternative 6: Widen Road for Additional Capacity	Widen road for additional through traffic lanes to accommodate growth.
Alternative 7: Divert Traffic to Other Roads	Encourage goods movement and other vehicular traffic travelling northwest to use alternatives to Airport Road through Caledon East.

6.3 Evaluation of Alternative Solutions

Each alternative solution was assessed to determine its net positive and negative impacts (after considering mitigation) under the transportation, natural, social, cultural, and economic criteria outlined above. The 'Do Nothing' alternative served as a benchmark to compare alternatives. Table 15 notes the assessment and evaluation of alternative solutions.

Table 15: Evaluation of Alternative Solutions

Alternatives	Assessment		Evaluation
	Positive Impacts	Negative Impacts	
Do nothing	+No environmental impacts +No implementation cost	- Does not improve conditions for road users - Not consistent with Regional growth management policies, Caledon East Community Improvement Plan (CIP) and Peel Sustainable Transportation Strategy (STS)	▪Does not address problem/opportunity ✓**Carried forward as benchmark to compare alternatives**
Limit growth	+No environmental impacts +No implementation cost	- Not consistent with Regional growth management policies and planned future land uses	▪Does not address problem/opportunity
Manage travel demand	+Region-wide policies and initiatives to encourage alternative transportation ongoing +No immediate environmental impacts	- No existing/planned transit within corridor	▪Has potential to address part of problem/opportunity ▪Implemented at Region-wide level, therefore removed from list of alternatives
Provide for active transportation	+Encourages walking and cycling per Peel STS +Opportunities for Low Impact Development (LID) (e.g., rainwater retention) in Stormwater Management (SWM) +Consistent with Caledon East CIP +Active transportation can contribute to improved public health	- Possible encroachment into natural/cultural areas - Possible property requirements - Potential conflicting uses (e.g., trucks and active transportation) - Possible loss of parking to accommodate active transportation - Distance between communities not practical for commuter cyclist - Moderate implementation cost	▪Does address part of problem/opportunity ▪Negative impacts can be avoided/mitigated ✓**Carried forward as part of solution**
Improve traffic operations	+Focuses on operational constraints rather than encouraging more traffic to use the corridor +Opportunities for LID (e.g. rainwater retention) in SWM +Consistent with Peel growth management policies	- Possible encroachment into natural/cultural areas - Possible property requirements - Moderate implementation cost	▪Does address part of problem/opportunity ▪Negative impacts can be avoided/mitigated ✓**Carried forward as part of solution**
Widen road for additional capacity	+2015 Caledon East Feasibility Studies indicated sufficient capacity on Airport Road	- Significant property requirements due to existing, constrained right-of-way	▪Does not address problem/opportunity
Divert traffic to other roads	+Goods movement and other vehicular traffic travelling north on Airport Road could turn onto east–west truck routes (e.g., King Street to connect with Hurontario Street or Highway 50) before entering Caledon East +Consistent with Peel Goods Movement Strategic Network	- Airport Road is a truck route per the Peel Goods Movement Strategic Network, therefore diverting all truck traffic is not feasible - May contribute to increased traffic noise and emissions on other routes	▪Does address part of problem/opportunity ▪Negative impacts can be avoided/mitigated ▪The Region of Peel will assess the feasibility of Olde Base Line Road as a Primary Truck Route in conjunction with the Environmental Assessment Study for Airport Road ✓**Carried forward as part of solution**

6.4 Recommended Alternative Solution

Based on the evaluation of alternatives, a preliminary recommended solution was determined **to better accommodate all uses in the corridor, to improve safety and support local communities.** The preliminary recommended solution was a combination of three alternatives:

- **Alternative 3: Improving traffic operations** by adding traffic calming measures, traffic signals or roundabouts, and turning lanes; realigning intersections; and/or improving road geometrics. Improvements at and/or near intersections will require minor road widening.
- **Alternative 5: Providing for active transportation** by adding or enhancing facilities that accommodate walking and cycling
- **Alternative 7: Diverting traffic to other roads** by encouraging goods movement and other vehicular traffic travelling northwest to use alternatives to Airport Road through Caledon East.

This recommended alternative planning solution was presented to review agencies and the public for feedback during the first round of public consultation, which included PIC No. 1. A summary of the feedback is provided in Section 5 of this ESR.

6.4.1 Selection of Preferred Solution

The recommended alternative planning solution was confirmed as the preferred planning solution based on a review of feedback received from agencies, the public and other stakeholders. The preferred planning solution best addressed the Problem and Opportunity Statement, and was carried forward to Phase 3 of the Class EA.

6.5 Design Considerations

Design criteria and typical cross-sections for the preferred solution were prepared for the development of alternative design concepts in the next phase of the Study. These design considerations were included in the consultation materials for agency and public feedback, including PIC No. 1 (see Section 5 for a summary of feedback). The subsequent design criteria and typical cross-sections that carried through to Phase 3 are described below.

6.5.1 Design Criteria

Table 16 summarizes the design criteria used to develop the alternative design concepts for the Preferred Solution identified next in Section 7. The design criteria generally follows the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads or the Ontario Traffic Manual (OTM).

Table 16: Design Criteria

Airport Road – King Street to 635m South of Olde Base Line Road

DESIGN PARAMETERS	PRESENT CONDITIONS	DESIGN STANDARDS / MINIMUMS		PROPOSED STANDARDS
		TAC	MTO	
Road Classification	Major Arterial Urban/Rural Undivided	-	-	Major Arterial Rural Undivided
ROW Width	35m	-	-	35m
Posted Speed	80km/hr	-	-	80km/hr
Design Speed (D.S.)	90km/hr	-	-	90km/hr
Minimum Stopping Sight Distance	-	190m – 265m (For trucks with conventional braking)	160m	190m
Equivalent Minimum 'K' Factor for 90km/hr D.S.	-	30 – 40 Sag 32 – 53 Crest	40 Sag 50 Crest	40 Sag 50 Crest
Minimum Radius for 90km/hr D.S	-	380m	-	380m
Lane Width for 90km/hr D.S.	3.75m – 4.0m Travel Lane	3.50m	3.50m	3.50m Travel Lanes
Taper Length	-	20:1 LT Ratio 25:1 RT Ratio	-	20:1 LT Ratio 25:1 RT Ratio
Clear Zone Width	-	5m – 5.5m	4m - 6m	6m
Minimum/Maximum Grades	-	Min 0.5% Max 3% to 5%	-	Minimum 0.5% Maximum 4%

ROW – Right-of-Way

Airport Road – 635m South of Olde Base Line Road to 260m South of Hilltop Drive

DESIGN PARAMETERS	PRESENT CONDITIONS	DESIGN STANDARDS / MINIMUMS		PROPOSED STANDARDS
		TAC	MTO	
Road Classification	Major Arterial Urban/Rural Undivided	-	-	Major Arterial Urban Undivided
ROW Width	31m	-	-	35m
Posted Speed	60km/hr	-	-	60km/hr
Design Speed (D.S.)	70km/hr	-	-	70km/hr
Minimum Stopping Sight Distance	-	135 - 180m (For trucks with conventional braking)	110m	135m
Equivalent Minimum 'K' Factor for 70km/hr D.S. MTO Part 2 C4-7 Headlight (sag) Table 2.1.3.4 (sag) Table 2.1.3.2 (crest)	-	20 – 25 Sag 16 – 23 Crest	25 Sag 25 Crest	25 Sag 25 Crest
Minimum Radius for 70km/hr D.S Table 2.1.2.4+0.04(m/m)	-	200m	-	200m
Lane Width for 70km/hr D.S.	3.75m Travel Lanes	3.5m	3.5m	3.5m Travel Lanes
Taper Length	-	20:1 LT Ratio 21:1 RT Ratio (without auxiliary lanes) 17:1 – 20:1 RT (with 50-110m storage)	-	20:1 LT Ratio 21:1 RT Ratio (without auxiliary lanes) 17:1 – 20:1 RT (with 50-110m storage)

DESIGN PARAMETERS	PRESENT CONDITIONS	DESIGN STANDARDS / MINIMUMS		PROPOSED STANDARDS
Clear Zone Width	-	3.5m – 4.5m	3m - 4m	4m
Minimum/Maximum Grades	-	Min 0.5% Max 3% to 5% (for above 100 km/hr) Max 7% to 8% (for less than 50 km/hr)	-	Minimum 0.5% Maximum 6%

Airport Road – 260m South of Hilltop Drive to Huntsmill Drive (North Portion)

DESIGN PARAMETERS	PRESENT CONDITIONS	DESIGN STANDARDS / MINIMUMS		PROPOSED STANDARDS
		TAC	MTO	
Road Classification	Major Arterial Urban/Rural Undivided	-	-	Major Arterial Urban Undivided
ROW Width	20-30m	-	-	20-30m
Posted Speed	50km/hr	-	-	50km/hr
Design Speed (D.S.)	60km/hr	-	-	60km/hr
Minimum Stopping Sight Distance	-	105m - 130m (For trucks with conventional braking)	85m	105m
Equivalent Minimum 'K' Factor for 60km/hr D.S. MTO Part 2 C4-7 Headlight (sag) Table 2.1.3.4 (sag) Table 2.1.3.2 (crest)	-	15 – 18 Sag 10 – 13 Crest	18 Sag 15 Crest	18 Sag 15 Crest

DESIGN PARAMETERS	PRESENT CONDITIONS	DESIGN STANDARDS / MINIMUMS		PROPOSED STANDARDS
Minimum Radius for 60km/hr D.S Table 2.1.2.4 +0.04(m/m)	-	130m	-	130m
Lane Width for 60km/hr D.S.	3.50-3.75m Travel Lane 3.20m Parking Lane	3.0m Travel Lane 2.50m Parking Lane	3.0m Travel Lane 2.50m Parking Lane	3.35m – 3.50m Travel Lane 2.40m Parking Lane
Taper Length	-	20:1 LT Ratio 18:1 RT Ratio (without auxiliary lanes) 14:1 – 17:1 RT Ratio (with 40 – 90m storage)	-	20:1 LT Ratio 18:1 RT Ratio (without auxiliary lanes) 14:1 – 17:1 RT Ratio (with 40 – 90m storage)
Clear Zone Width	-	0.5m minimum with barrier curb 0.9m at intersection	3m or 0.5m with barrier curb	3m without curb 0.5m with barrier curb
Minimum/Maximum Grades	-	Min 0.5% Max 3% to 5% (for above 100 km/hr) Max 7% to 8% (for less than 50 km/hr)	-	Minimum 0.5% Maximum 7%

Of note are the following criteria to ensure the alternative designs satisfy the intent of the Preferred Solution and to address agency input:

- Within the northern portion of the corridor, travel lanes were narrowed to act as a traffic calming measure.
- Within Caledon East, travel lanes and parking lanes were narrowed to act as a traffic calming measure and to accommodate active transportation facilities.

Active Transportation / Boulevard Elements

Design Parameters	Present Conditions	Design Standard		Proposed Standard
		TAC	MTO	
Cycling Design Speed	-	20-30km/h	N/A	20km/hr with consideration for higher speeds depending on grades
Multi use paths	-	2.4m (absolute lower limit) Preferred = 3.0m	Constrained minimum = 2.4m Preferred = 3.0m – 4.0m	3.0m preferred but 2.4m where constrained
Paved Shoulders	-	1.8m – 3.0m	Min = 1.2m Preferred = 2.0m	2.0m paved shoulders with rumble strips
Street Buffer Between Cycling Facility and Adjacent Travel Lanes	-	0.3m – 1.0m	1.0m	Minimum: 0.3m Preferred: 1.0m+
Horizontal Clearance	-	Min = 0.25m for 100mm to 750mm high Min = 0.5m for features >750mm high	0.25m	Minimum: 0.25m Preferred: 0.5m
Vertical Clearance	-	2.7m – 3.6m	2.5m	Minimum = 2.5m Preferred = 3.0m

6.5.2 Typical Cross-Sections

Figure 12 and Figure 13 illustrate the typical urban and rural cross-sections for the Study corridor, which were used as a starting point in the development of design concepts during the next phase of the Study. Cross-sections were adjusted during Phase 3 based on public feedback and the alternative design concepts developed.

Figure 12: Typical Urban Cross-Section for Preferred Solution

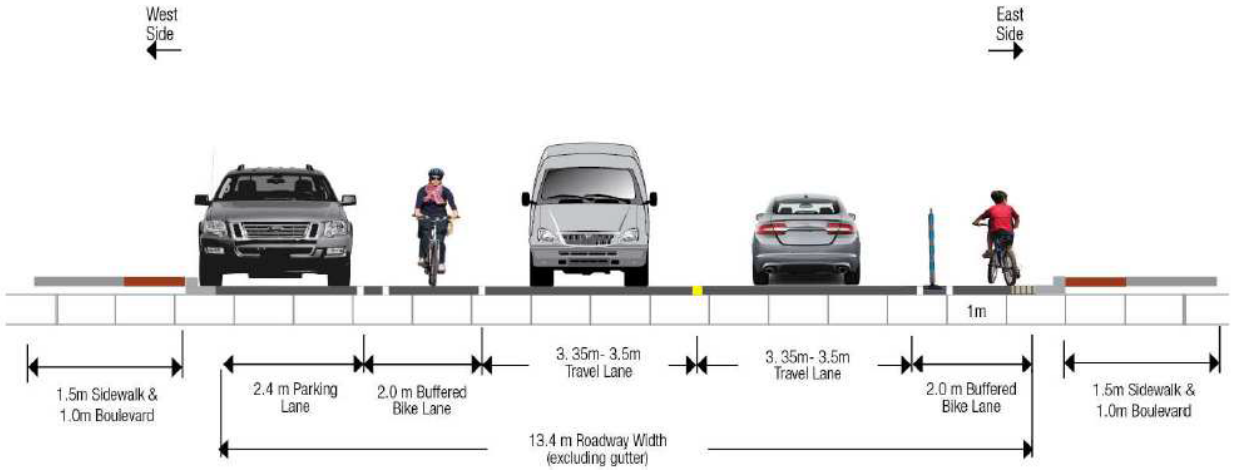
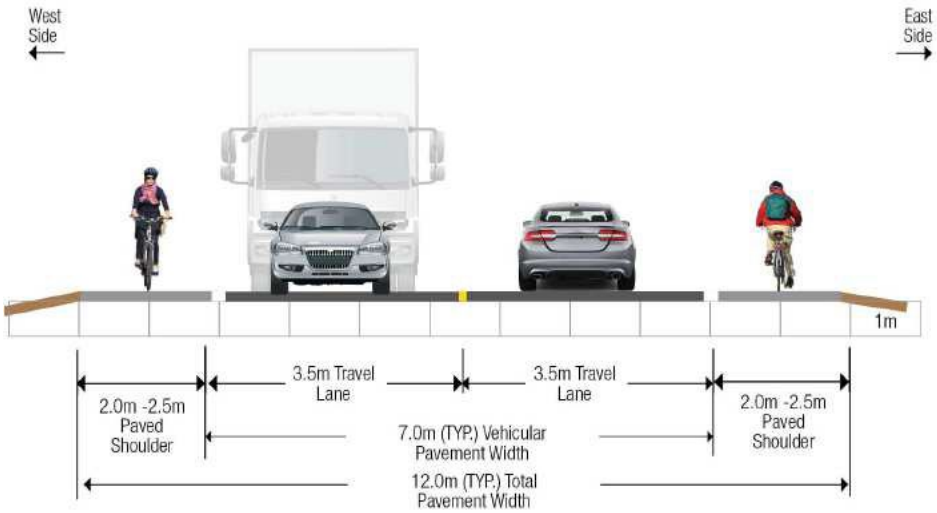


Figure 13: Typical Rural Cross-Section for Preferred Solution



6.5.3 Potential Design Options in Caledon East

Several design options to improve Airport Road in downtown Caledon East were considered in subsequent stages of the Class EA. At the time of PIC No. 1, the Project Team shared the following initial concepts for agency and public feedback:

To enhance the accommodation of pedestrians and cyclists:

- Widen sidewalks and provide enhanced streetscaping between parking laybys

- Add bike lanes within the roadway, improve sidewalks and add streetscaping between parking lay-bys, with potential need to use local roads for a bypass of Airport Road from south of Hilltop Drive to Mountcrest Road.

- Reconstruct the boulevard to provide cycle tracks and new sidewalks, with streetscaping between parking lay-bys.

To address safety and operational concerns at Airport Road and Old Church Road:

- Connect Old Church Road to Ivan Avenue
- Maintain and signalize driveway
- Convert driveway access to right-in/right-out

To improve traffic operations and safety at other intersections:

- Signalized intersections
- Roundabouts

6.5.4 Potential Design Implications

A general overview of advantages and disadvantages for each concept was presented at PIC No. 1. This included the potential for impacts to on-street parking as a result of the above concepts and other potential traffic-related improvements. For example, improvements and benefits under consideration at the time included:

Bicycle lanes

- Improved safety
- Can encourage cycling
- Improved aesthetic of road

- Removal of parking on one side of the road (19 spaces)

Two-way left-turn lane

- Can improve safety
- Improved traffic operations

- Removal of parking on one side of the road (19 spaces)

- Implementing both options would require removal of parking on both sides of the road (38 spaces)

The advantages and disadvantages identified for each concept were further refined and updated based on public feedback, and detailed technical and environmental impact assessments (see Section 7 and Section 8, respectively).

6.6 Confirmation of Class EA Schedule

The Preferred Solution was compared to the project descriptions in the MEA Municipal Class EA to confirm the Class EA project schedule. As demonstrated in Table 17, the highest level of assessment required among the proposed improvements, including potential design options, was confirmed to be Schedule C.

Table 17: Confirmation of MEA Municipal Class EA Project Descriptions and Schedules

MEA Project Description	Proposed Solution for Airport Road	Class EA Schedule
Construction or removal of sidewalks or multi-purpose paths or cycling facilities within existing or protected rights-of-way	Provide for active transportation by adding or enhancing facilities that accommodate walking and cycling	Schedule A
Urban: Resurfacing, with no change to horizontal alignment Rural: Resurfacing, with no change to horizontal alignment	Potential need for road resurfacing was to be confirmed during Phase 3 as a potential outcome of the Preferred Solution	Schedule A
Streetscaping (e.g., decorative lighting, sidewalk improvements, benches, landscaping not part of another project)	Potential for enhanced streetscaping in Caleodn East to be confirmed during Phase 3 as a potential outcome of the Preferred Solution	Schedule A+
Construction of localized operational improvements at specific locations	Improve traffic operations at intersections (e.g., by adding turn lanes or roundabouts and/or realigning offsets)	Schedule A+
Installation, construction or reconstruction of traffic control devices (e.g., signing, signalization)	Improve traffic operations at intersections (e.g., adding traffic signals)	Schedule A if less than $9.5 million (M) Schedule B if greater than $9.5M
Construction of a new culvert to increase culvert size due to change in drainage area	Potential need to upgrade crossing culverts was to be confirmed during Phase 3 as a potential outcome of the Preferred Solution	Schedule A+
Reconstruction where the reconstructed road or other linear paved facilities (e.g., HOV lanes) will be for the same purpose, use, capacity and at the same location (e.g., addition or reduction of	No widening for additional through lanes; Provide for active transportation by adding or enhancing facilities that accommodate walking and cycling; Potential removal of on-street parking to accommodate active	Schedule A+

cycling lanes/facilities or parking lanes, provided no change in the number of motor vehicle lanes)	transportation and/or centre left-turn lane in Caledon East was to be assessed during Phase 3 as a potential outcome of the Preferred Solution	
Reconstruction where the reconstructed road or other linear paved facilities (e.g., HOV lanes) will not be for the same purpose, use, capacity and at the same location (e.g., addition of continuous centre turn lane)	Potential centre left-turn lane in Caledon East to be confirmed during Phase 3 as a potential outcome of the Preferred Solution	Schedule B if less than $2.4M Schedule C if greater than $2.4M
Construction of new roads or other linear paved facilities (e.g., HOV lanes)	Potential extension of Old Church Road to Ivan Avenue (west leg of intersection) was to be confirmed during Phase 3 as a potential outcome of the Preferred Solution	Schedule B if less than $2.4M Schedule C if greater than $2.4M
Construction of noise barriers, i.e., structures such as walls and berms or a combination of the two	Potential need for noise mitigation was to be confirmed during Phase 3 as a potential outcome of the Preferred Solution	Schedule A+

7. ALTERNATIVE DESIGN CONCEPTS

During Phase 3 of the Class EA, alternative design concepts were developed and examined for the preferred solution, which is a combination of:

- **Improving traffic operations** by adding traffic calming measures, traffic signals or roundabouts, and turning lanes; realigning intersections; and/or improving road geometrics. Improvements at and/or near intersections will require minor road widening.
- **Providing for active transportation** by adding or enhancing facilities that accommodate walking and cycling
- **Diverting traffic to other roads** by encouraging goods movement and other vehicular traffic travelling northwest to use alternatives to Airport Road through Caledon East.

7.1 Description of Alternative Corridor Designs

Several design alternatives were developed due to the diverse nature of the corridor. To guide the development of a context-sensitive design, the corridor was segmented into three categories: urban, rural, and transitional areas. The boundaries of the segments were determined based on land use and physical and natural features. Intersections were evaluated separately.

7.1.1 Rural Area

For the purposes of the assessment, the Rural Area is considered to extend from north of King Street to Olde Base Line Road and from Leamster Trail to north of Huntsmill Drive. The design alternatives that were considered in this segment are listed below.

1. Do nothing (considered for comparison purposes) (Figure 14)
2. Reduced lane widths with paved shoulders and rumble strips (Figure 15)

Figure 14: Rural Area - Design Alternative 1 (Do Nothing)

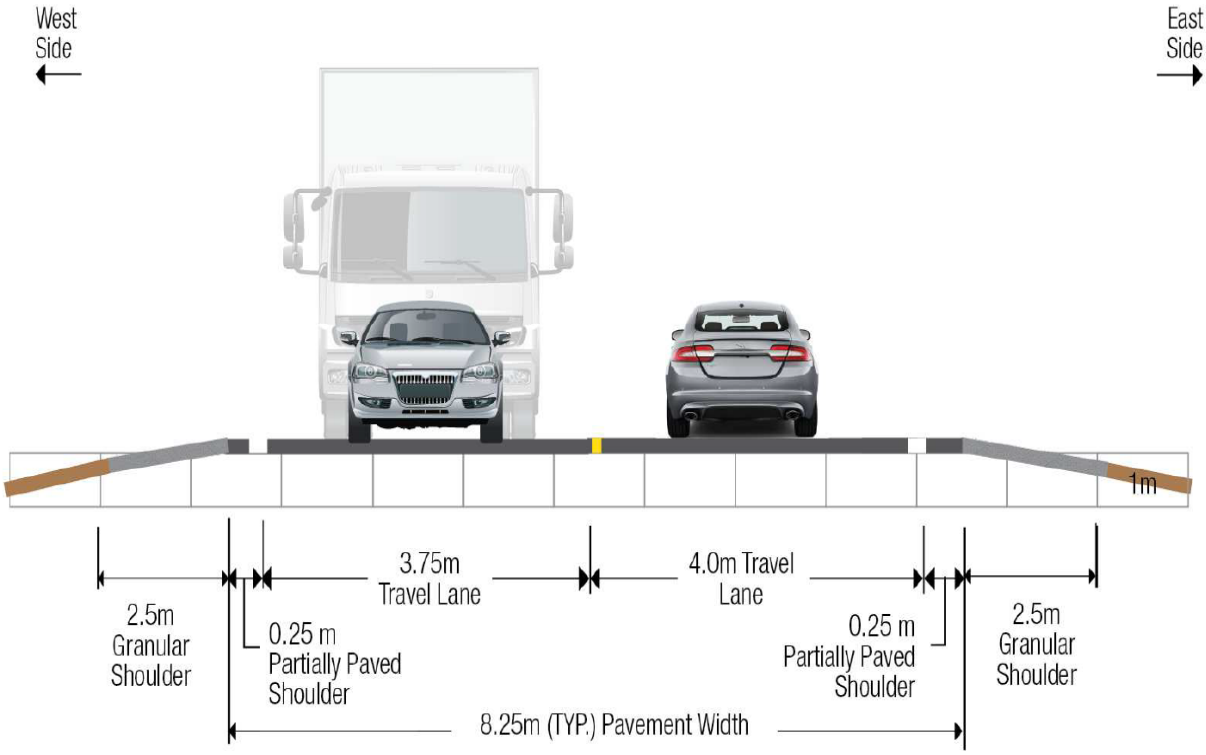
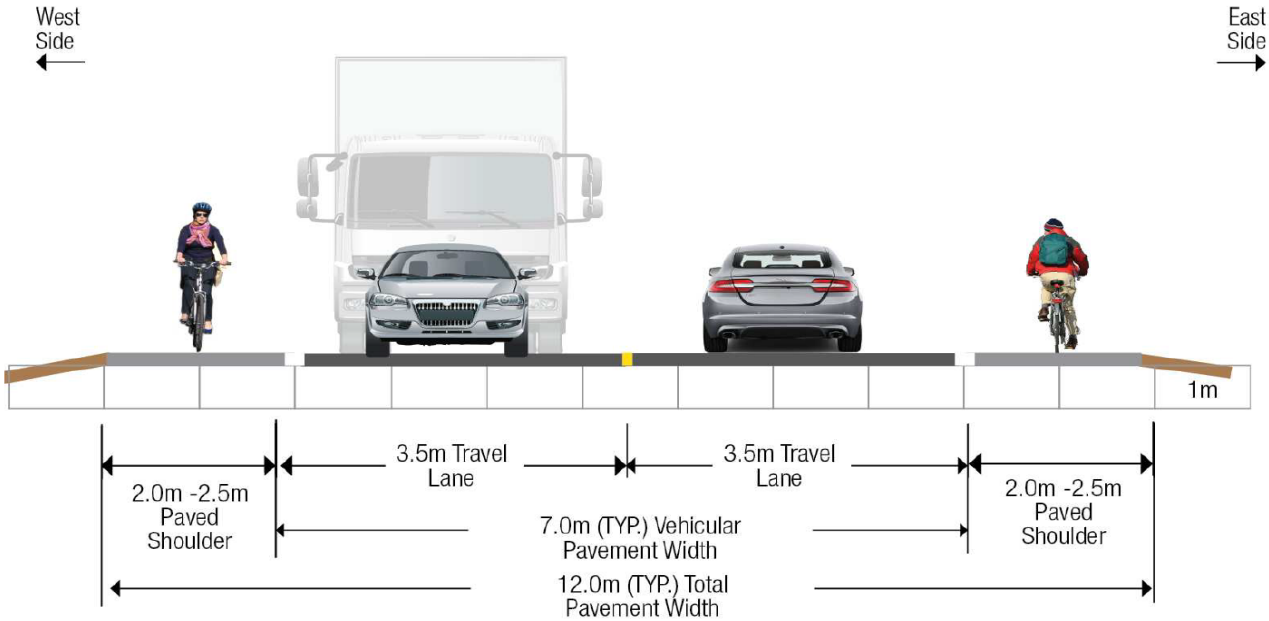


Figure 15: Rural and Urban Area - Design Alternative 2



7.1.2 Urban Area

For the purpose of the assessment, the Urban Area is considered to extend from Hilltop Drive to Walker Road.

The corridor from Hilltop Drive to the Caledon Trailway is significantly constrained by property, retaining walls and hydro utility. As such, there is insufficient space for enhancements through this section of Airport Road.

The section from the Caledon Trailway to Old Church Road is also constrained by property and hydro utility. This section was initially considered for a continuous two-way left-turn lane or partial left-turn lane to improve access to side-streets and property entrances. Following PIC No. 1, the left-turn lane options were removed from further consideration due to insufficient corridor space to accommodate the additional lane width in combination with measures to encourage slower speeds and improve the safety for pedestrians and cyclists. The additional lane width was not in keeping with the commitment to maintain the current two-lane cross-section through the village core (i.e., not widen the road). Moreover, the additional lane width would result in the removal of parking on one or both sides of the road.

The design alternatives that were considered in this segment are listed below.

1. Do nothing (considered for comparison purposes) (Figure 16).

2. Two-lane urban cross-section with reduced lane widths, wider sidewalks on both sides, provisional width for future designated cycling facility, and streetscaping between parking lay-bys on the west side from the Caledon Trailway to Walker Road. The provisional width in this option provides flexibility for implementing a cycling facility within the constrained corridor (Figure 17 with cycling facility as provisional).

3. Two-lane urban cross-section with reduced lane widths, sidewalks on both sides, on-street buffered bike lanes on both sides, and streetscaping between parking lay-bys on the west side from the Caledon Trailway to Walker Road. This option was introduced in the Traffic Study and at PIC No. 1 (Figure 17).

4. Two-lane urban cross-section with reduced lane widths, improved sidewalk on the east side, multi-use path on the west side, and streetscaping between parking lay-bys from the Caledon Trailway to Walker Road. This alternative was introduced separate of the Traffic Study for increased separation between heavy truck/vehicular traffic and cyclists (Figure 18). Further, it provides an alternative to the concept of a cycle track in Alternative 6 below.

5. Two-lane urban cross-section with reduced lane widths, multi-use paths on both sides, and streetscaping between parking lay-bys on the west side from the Caledon Trailway to Walker Road (Figure 19). This alternative was introduced separate of the Traffic Study for increased separation

between heavy truck/vehicular traffic and cyclists, and for continuity of cycling infrastructure on both sides of the road throughout the corridor. It also provides an alternative to the concept of a cycle track in Alternative 6 below.

6. Two-lane urban cross-section with reduced lane widths, sidewalks and cycle tracks on both sides, and streetscaping between parking lay-bys on the west side from the Caledon Trailway to Walker Road. This alternative was introduced in the Traffic Study and at PIC No. 1 for increased separation between heavy truck/vehicular traffic and cyclists (Figure 20).

Figure 16: Urban Area - Design Alternative 1 (Do Nothing)

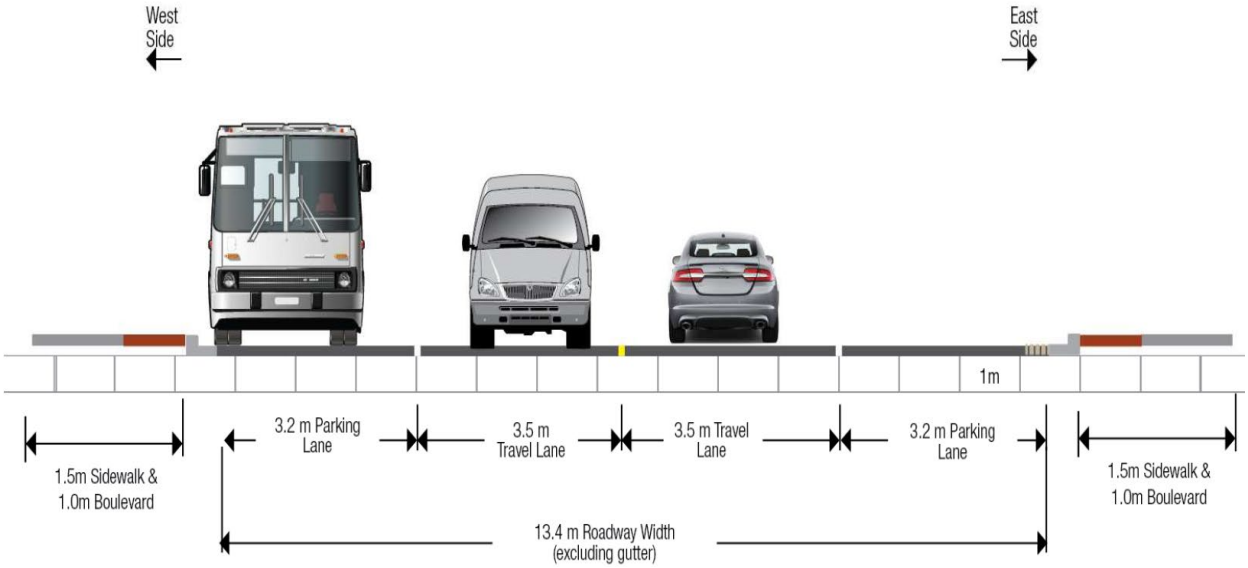


Figure 17: Urban Area - Design Alternative 2 (Provisional Cycling Facility) and Alternative 3

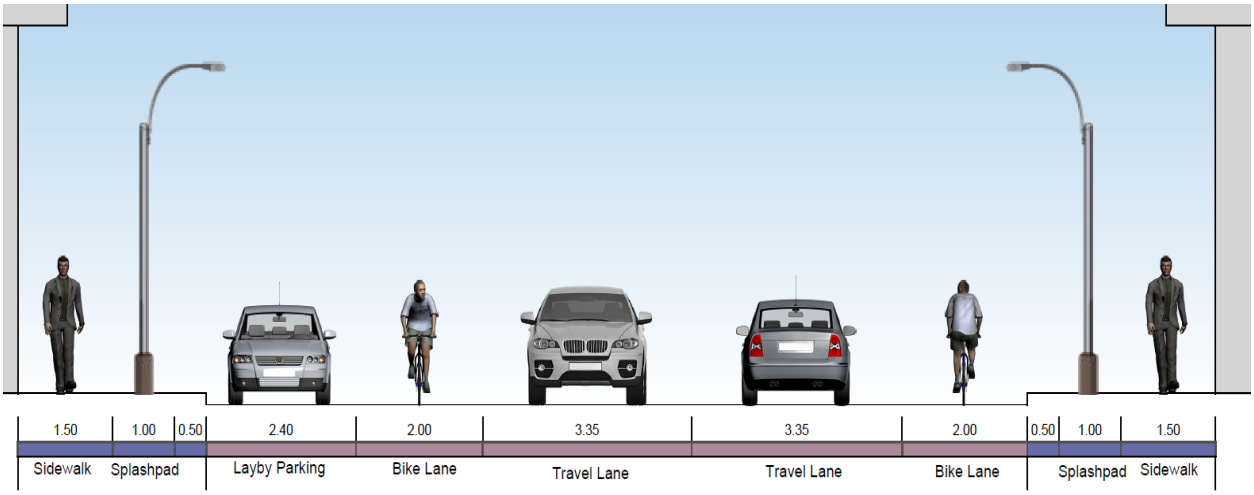


Figure 18: Urban Area - Design Alternative 4

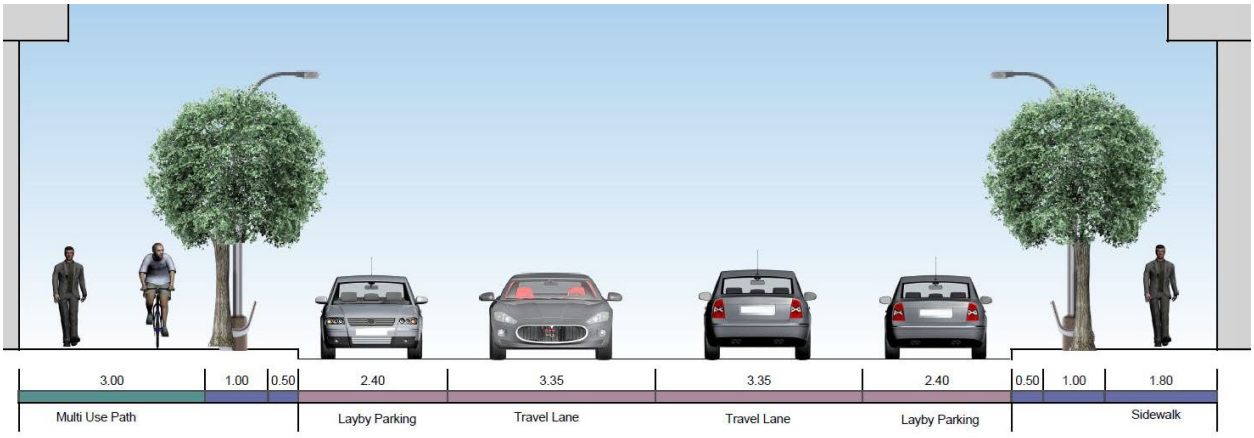


Figure 19: Urban Area - Design Alternative 5

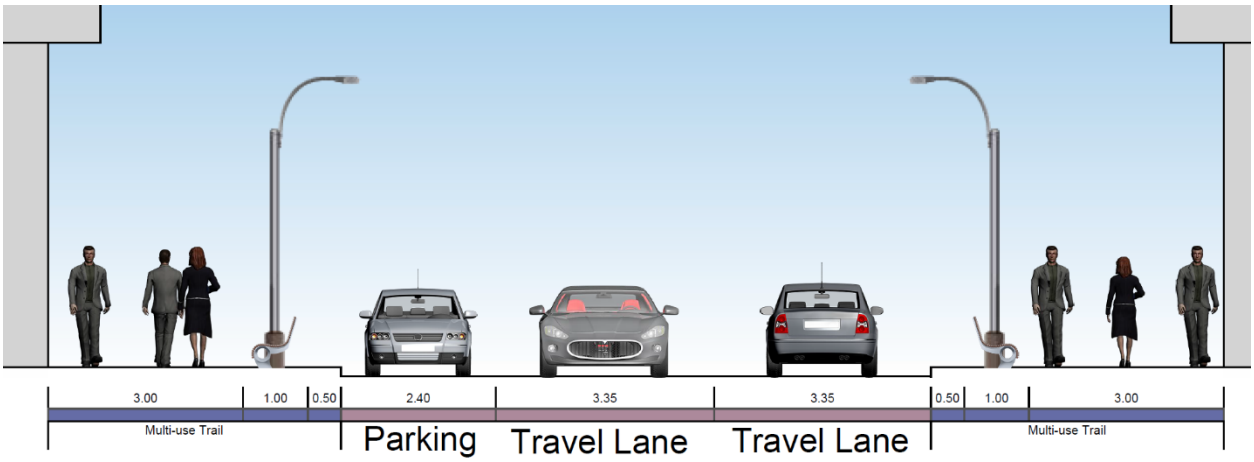
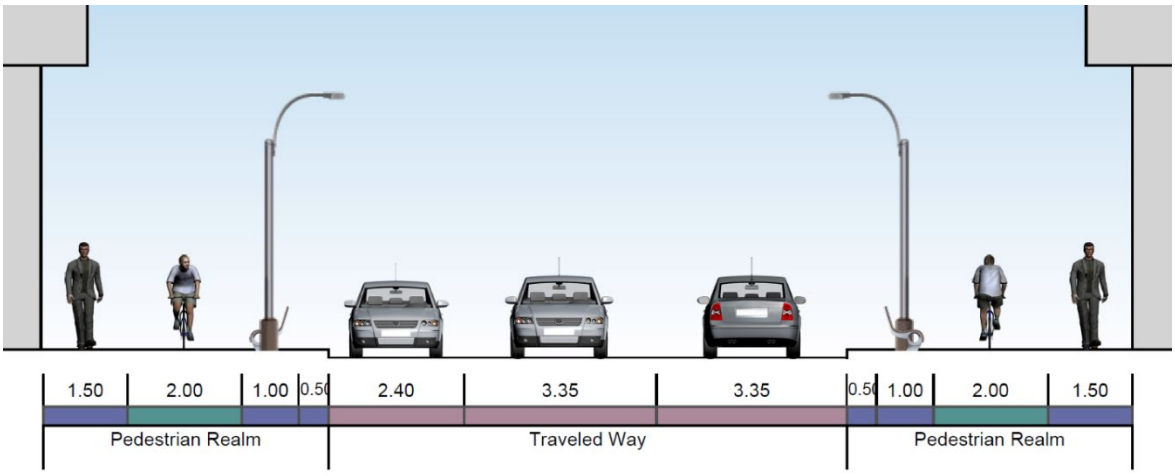


Figure 20: Urban Area - Design Alternative 6



7.1.3 Transitional Area

For the purpose of the assessment, the Transitional Area is considered to extend from Olde Base Line Road to Hilltop Drive and from Walker Road to Leamster Trail. Due to differing constraints, different active transportation options were developed for the two segments. The design alternatives that were considered are listed below, by area.

Olde Base Line Road to Hilltop Drive

This section is complicated by the relatively short transitions between the Mono Road community, rural lands between Mono Road and Caledon East, and the transition to urban within Caledon East. The following alternatives were considered:

1. Do nothing (for comparison purposes) (Figure 14).

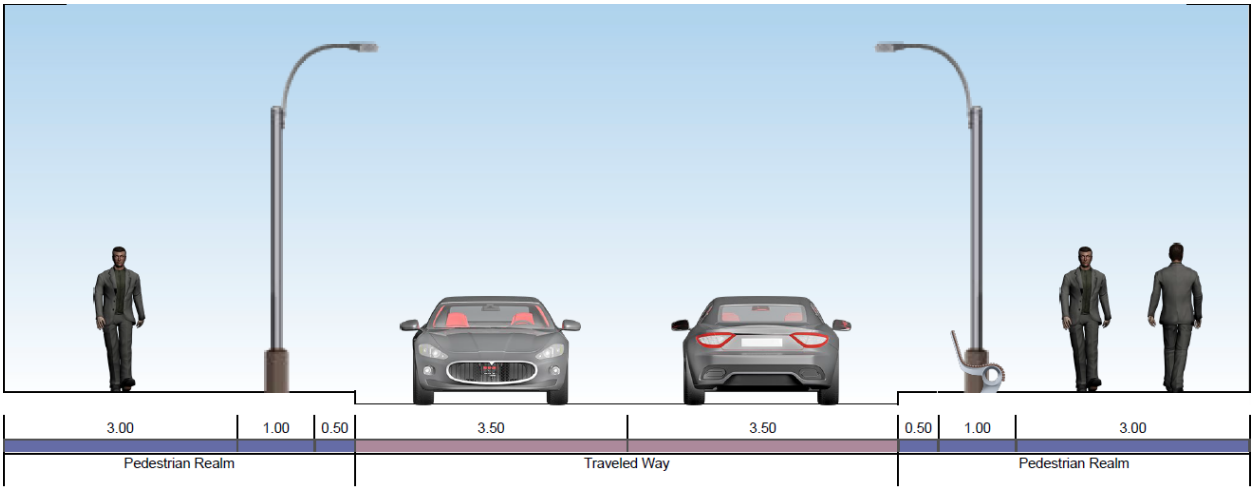
2. Reduced lane widths with paved shoulders and rumble strips (Figure 15). This alternative was introduced in the Traffic Study for the rural area from Olde Base Line Road to the Settlement boundary south of Cranston Drive. It provides continuity in road elements (e.g., paved shoulder) with the alternatives considered for the Rural Area to the south.

3. Reduced lane widths, sidewalks, and on-street buffered bike lanes. This alternative was introduced in the Traffic Study for the urban area from south of Cranston Drive to Hilltop Drive (Figure 17). It provides continuity in road elements (e.g., bike lanes) with the alternatives considered for the Urban Area to the north.

4. Reduced lane widths, sidewalk on the east side and multi-use path on the west side (Figure 18). This alternative was introduced separate from the Traffic Study for increased separation between heavy truck/vehicular traffic and cyclists. It also provides continuity of road elements (e.g., multi-use path) with the alternatives considered for the Urban Area to the north.

5. Reduced lane widths and multi-use paths (Figure 21) This alternative was introduced separate from the Traffic Study for increased separation between heavy truck/vehicular traffic and cyclists. It also provides continuity of road elements (e.g., multi-use path) with the alternatives considered for the Urban Area to the north.

Figure 21: Olde Base Line Road to Hilltop Drive - Design Alternative 5



Walker Road to Leamster Trail

This section was assessed separately from Caledon East due to the transitional nature of the road and concerns heard about traffic speeds and safety. Alternatives considered were:

1. Do nothing for comparison purposes (two travel lanes with pathway on west side and granular shoulder on east side).

2. Reduced lane widths with multi-use path on west side with raised curbs and paved shoulder and rumble strip on east side (.

3. Figure 22). This alternative was introduced in the Traffic Study. It upgrades the existing walkway on the west side to a multi-use path and provides continuity of road elements (e.g., path on the west side and paved shoulder on the east side) with the alternatives considered within the Urban Area to the south and the Rural Area to the north. Additional elements, such as a raised centre median, was introduced to provide traffic calming for southbound vehicles approaching Caledon East.

4. Reduced lane widths with multi-use path on west side and new sidewalk and buffered bike lane on east side (Figure 23). This alternative was introduced separate of the Traffic Study. It provides continuity of road elements (e.g., multi-use path on the west side and bike lane on the east side) with the alternatives considered within the Urban Area to the south and the Rural Area to the north.

Figure 22: Walker Road to Leamster Trail - Design Alternative 2

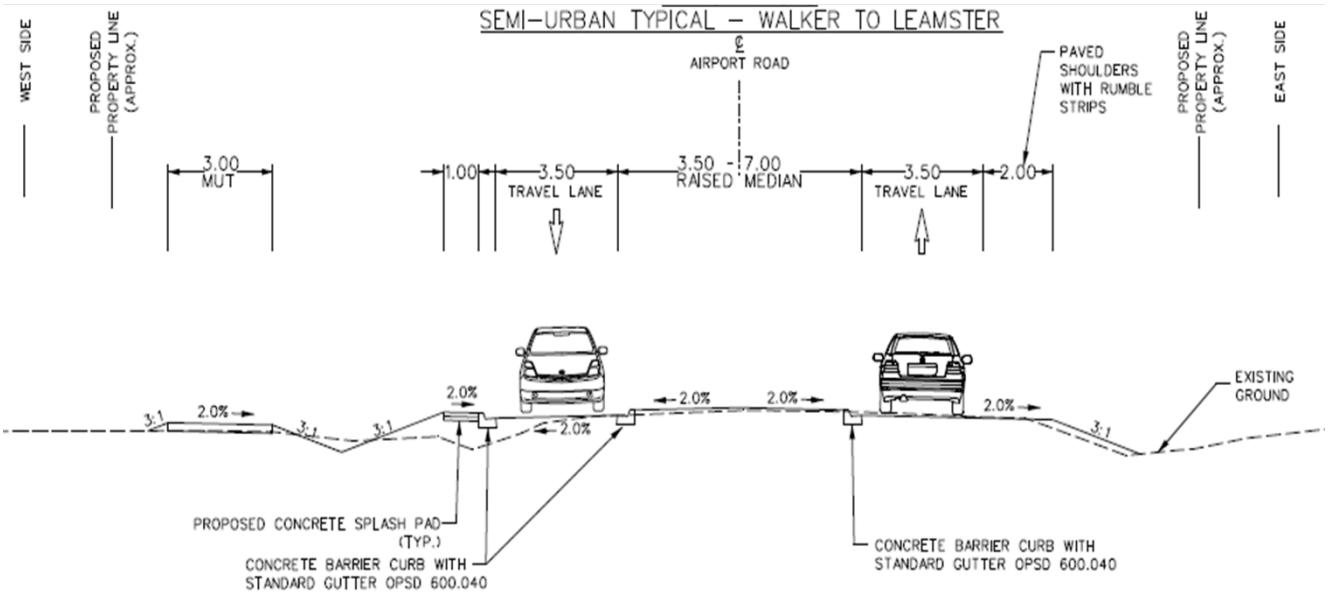
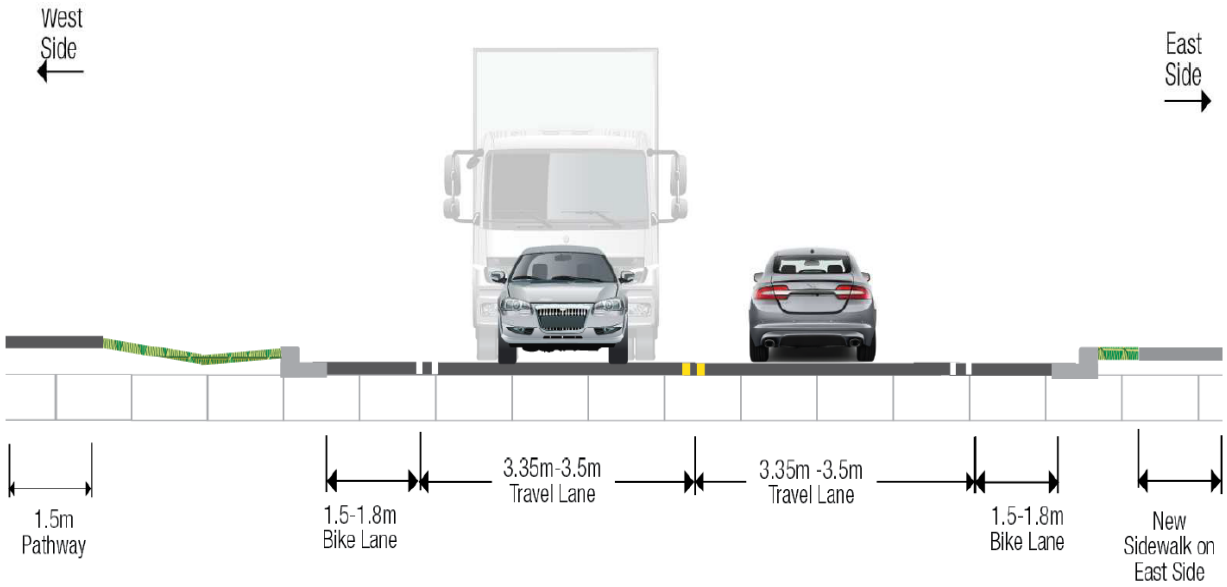


Figure 23: Walker Road to Leamster Trail – Design Alternative 3



7.2 Description of Alternative Intersection Designs

In addition to cross-section elements, intersections along the corridor were screened to evaluate the need for changes to traffic control, lane configuration, active transportation and safety, and to study the feasibility of implementing roundabouts.

The Traffic Study identified five intersections as candidates for a roundabout: Castlederg Side Road-Boston Mills Road, Olde Base Line Road, Cranston Drive, Walker Road and Huntsmill Drive. For these five locations, the following alternatives were evaluated:

1. Do nothing (for comparison purposes)
2. Conventional intersection with additional turn lanes and/or traffic signals
3. Roundabout to accommodate traffic capacity while encouraging reduced speeds

Eight options were considered for the intersection of Old Church Road and Airport Road to address the operational and safety concerns identified in the Traffic Study and by the public:

1. Do nothing (for comparison purposes)
2. Restrict access to right-in right-out. This alternative was introduced in the Traffic Study and at PIC No. 1.
3. Restrict access to one-way. This alternative was introduced in the Traffic Study to reduce driver confusion at the unsignalized driveway and reduce the potential for pedestrian and vehicle conflicts.
4. Close access. This alternative was considered separate of the Traffic Study to include as many reasonable and feasible solutions as possible to address the safety concerns at the unsignalized driveway.
5. Relocate access to the north (on adjacent properties). This alternative was introduced separate of the Traffic Study to include as many reasonable and feasible alternatives as possible to address the safety concerns at the unsignalized driveway.
6. Signalize driveway access with split phasing. This alternative was introduced in the Traffic Study and presented at PIC No. 1.
7. Extend Old Church Road to Ivan Avenue and relocate building. The alternative to extend Old Church Road was introduced in the Traffic Study and at PIC No. 1; and was separated into Alternative 7 and 8 to address the impact to the heritage building on site.
8. Extend Old Church Road to Ivan Avenue and remove building. The alternative to extend Old Church Road was introduced in the Traffic Study and at PIC No. 1; and was separated into Alternative 7 and 8 to address the impact to the heritage building on site.

It is noted that the intersection at Old Church Road was not considered for a roundabout primarily due to significant property constraints and potentially low effectiveness for speed reduction at that location. This intersection was evaluated separately to address a different range of operational and safety concerns, and alternative designs.

7.3 Assessment of Alternative Designs

The design alternatives were assessed against similar criteria used to evaluate the alternative planning solutions in Phase 2 of the Class EA. The criteria were updated as per Table 18 to provide a detailed assessment of design concepts and to incorporate feedback from the public and agencies. The criteria are grouped into five main themes: transportation, natural environment, social environment, cultural environment, and economic environment.

Table 18: Evaluation Criteria for Alternative Designs

Transportation

Criteria	Indicators
Maintains ability to address problem and opportunity	**Improves traffic operations** • Accommodates existing capacity for vehicular traffic • Accommodates future (2041) capacity for vehicular traffic
	Improves traffic safety • Facilitates lower traffic speeds • Reduces potential for and/or severity of collisions among road users
	Encourages some trucks to use other truck routes • Introduces measures to encourage trucks travelling northwest to use alternative truck routes in advance of Caledon East
	Improves road geometrics • Improves road alignment
	Maintains emergency response time • Avoids or limits barriers to emergency routes • Accommodates emergency vehicles in road design
	Conforms to transportation planning policies and plans: • Consistent with Region of Peel Long Range Transportation Plan (2019) • Consistent with Region of Peel Sustainable Transportation Strategy (2018) • Consistent with Region of Peel Vision Zero Road Safety Strategic Plan (2018 - 2022) • Consistent with Town of Caledon Transportation Planning Study (2014)

Natural Environment

Criteria	Indicators
Complies with Provincial environmental planning policies	• Adheres to Oak Ridges Moraine Conservation Plan (2017) • Adheres to Greenbelt Plan (2017) • Adheres to Niagara Escarpment Plan (2017)

Avoids or reduces negative impacts on natural heritage features and wildlife and wildlife habitat	• Environmentally sensitive land affected:
	  • Local environmentally significant areas,
	  • Locally, provincially and unevaluated significant wetlands, and
	  • Provincial areas of natural and scientific interest
	• Trees to be removed or replaced
	• Potential impact on watercourse crossings
	• Potential impact on plant, wildlife and aquatic species and habitat
	• Potential impact on plant, wildlife and aquatic species at risk and habitat

Introduces opportunity to protect or enhance natural heritage features and wildlife and wildlife habitat	• Potential for wildlife crossings
Maintains or reduces risk for natural hazards (e.g., erosion and flooding)	• Potential extent of sediment erosion • Area of impervious surface contributing to storm water runoff • Hydraulic capacity of crossing culverts • Potential treatment of storm water runoff before entering creeks
Protects sources of drinking water	• Wellhead Protection Area affected
Provides opportunity to adapt to or mitigate the effects of climate change	• Potential for Low Impact Development in storm water management • Potential to reduce greenhouse gas emissions

Healthy Communities and Social, Cultural and Economic Criteria

Criteria	Indicators
Provides for active transportation	• Adds or enhances infrastructure for walking and cycling
Promotes healthy, age-friendly and accessible environments	• Reduces risk of chronic conditions through active transportation • Supports age-friendly and accessible living • Reduces risk of respiratory and cardiovascular outcomes associated with exposure to traffic related air pollution • Avoids or reduces noise impacts
Conforms to Municipal planning policies and community plans	• Consistent with Region of Peel Official Plan (2016) and growth management policies • Consistent with Town of Caledon Official Plan (2018) and Caledon East Community Improvement Plan (2014)
Compatible with existing and planned future land uses	• Maintains the function of existing and planned future land uses
Avoids or reduces property impacts (including cultural heritage and economic impacts)	• Private properties impacted • Buildings or structures displaced • Property accesses affected (removed, consolidated or modified) • Avoids or reduces negative impacts on cultural heritage and archaeological features • Supports local economic sustainability
Supports goods movement	• Consistent with Region of Peel Goods Movement Strategic Network (2017) • Accommodates transport trucks in road design
Reduces complexity of construction	• Avoids major conflict with utilities and municipal infrastructure • Potential impacts of staging required • Construction cost (including design, permits, utility, property, staging, construction, monitoring) • Operations and maintenance cost

The Project Team completed a preliminary evaluation that led to the technically preferred design concept for each segment of road (rural, urban and transitional) and major intersection. The detailed technical evaluation was presented to the public and agencies at PIC No. 2 for comment. A summary of the evaluation process and selection of the preferred alternative design concept(s) is provided below.

7.3.1 Rural Area

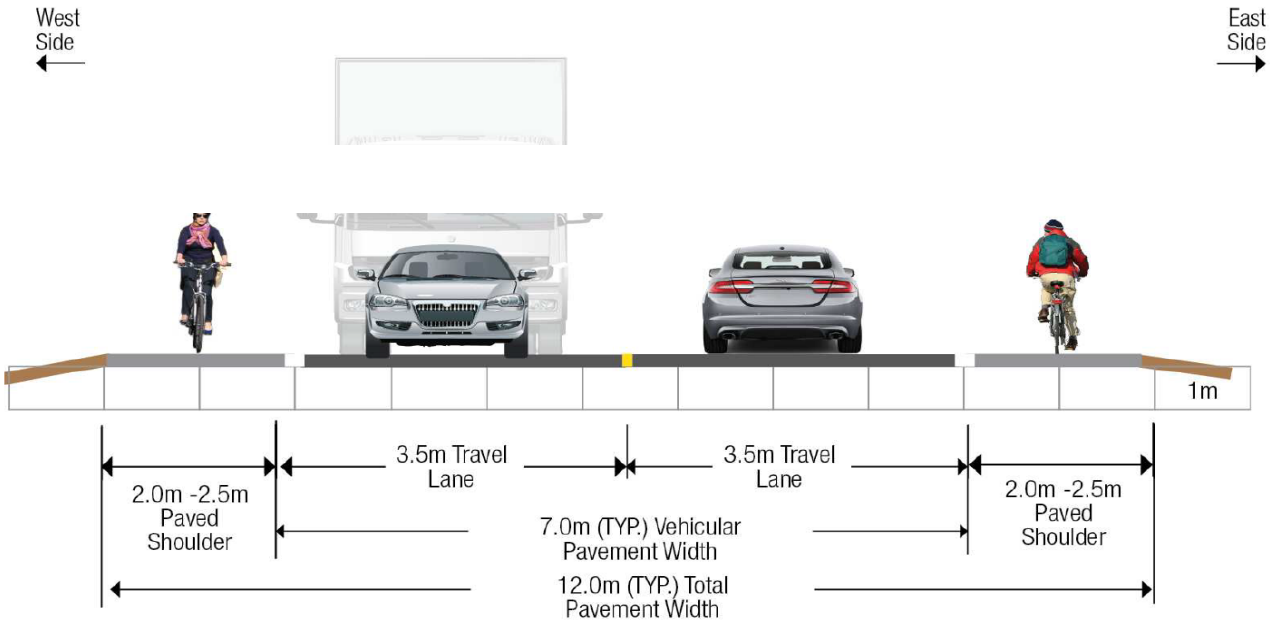
Two design alternatives were considered for the Rural Area, which extends from King Street to Olde Base Line Road and from Leamster Trail to north of Huntsmill Drive. The options are outlined above. Detailed evaluation tables are included in Appendix O and a summary is provided in Table 19**.**

Table 19: Summary Evaluation of Alternative Corridor Designs - Rural Area

Criteria \ Alternatives	Do Nothing (Two Travel Lanes with Granular Shoulders)	Reduced Lane Widths with Paved Shoulders and Rumble Strips
Transportation	**Not Preferred** • Not consistent with transportation planning policies and plans	**Preferred** • Generally consistent with transportation planning policies and plans. Reduced lane widths encourage slower traffic speeds, which in turn may encourage truck diversion.
Natural Environment	**Preferred** • No change to natural heritage features and wildlife and wildlife habitat	**Not Preferred** • Encroaches into minimum protection zones for locally significant wetlands and rare vegetation community. Unevaluated wetland community at Olde Base Line Road may experience direct loss. Minor extensions to culverts at watercourse crossings.
Healthy Communities	**Not Preferred** • No active transportation facilities which in turn does not provide an opportunity to promote a healthy (active), age friendly and accessible environment	**Preferred** • Paved shoulders accommodate pedestrians and cyclists within rural cross-section, however paved shoulders may not be comfortable for all pedestrians and cyclists
Social, Cultural and Economic Environment	**Preferred** • Does not fully conform with Region of Peel and Town of Caledon Official Plans and Growth Management Policies, however avoids negative impacts on cultural heritage features with no construction cost	**Preferred** • Conforms with Region of Peel and Town of Caledon Official Plans and Growth Management Policies, however with low construction cost and temporary traffic impact due to construction staging. Potential impacts to cultural heritage features can be avoided or mitigated.
Summary	Not carried forward Does not address problem and opportunity	**Preferred** **Will address problem and opportunity**

Based on the results of the evaluation and consultation, the preferred alterative is design alternative 2, reduced lane widths with paved shoulders and rumble strips (Figure 24). The preferred alternative is an improvement over existing conditions in the Rural Area to address the problem and opportunity identified in this Study.

Figure 24: Preferred Design Alternative - Rural Area



7.3.2 Urban Area

Six design alternatives were considered for the Urban Area, which is considered to extend from Hilltop Drive to Walker Road. The options are outlined above. Detailed evaluation tables are included in Appendix O and a summary is provided in Table 20.

Table 20: Summary Evaluation of Alternative Corridor Designs – Urban Area

Criteria \ Alternatives	Do Nothing	Two-Lane Urban Cross-Section with Reduced Lane Widths, Wider Sidewalk on Both Sides, Provisional Width for Future Designated Cycling Facility, and Streetscaping between Parking Lay-bys from Caledon Trailway to Walker Road	Two-Lane Urban Cross-Section with Reduced Lane Widths, Sidewalk and On-Street Buffered Bike Lanes on Both Sides, and Streetscaping between Parking Lay-bys on West Side from Caledon Trailway to Walker Road
Summary	**Not Carried Forward**	**Not Preferred for existing and short-term conditions**	**Not Preferred in EA due to less separation between bike and travel lanes, and loss of east side parking (Note preferred from cycling perspective)**
	Does not address problem and opportunity (included for comparison)	Provisional width of cross-section for long-term conditions does not fully support existing transportation policies or address existing opportunity for corridor improvements for vulnerable road users	Buffered bike lanes are consistent with existing transportation policy and provide continuity with local east-west on-road cycling routes and the Caledon Trailway. However, separation between bike lane and travel lane is less compared to other alternatives. Further, the buffer between the bike lane and travel lane is removed to provide door zone buffer at locations of parking layby. Further, the Town of Caledon and some of the Public have indicated a preference to maintain on-street parking to support businesses and road character. Although on-street parking appears to be utilized often as a convenient alternative to available off-street parking, it is considered by the Town of Caledon as part of the Caledon East streetscape. Presently, there are minor opportunities for parking replacement in Caledon East.

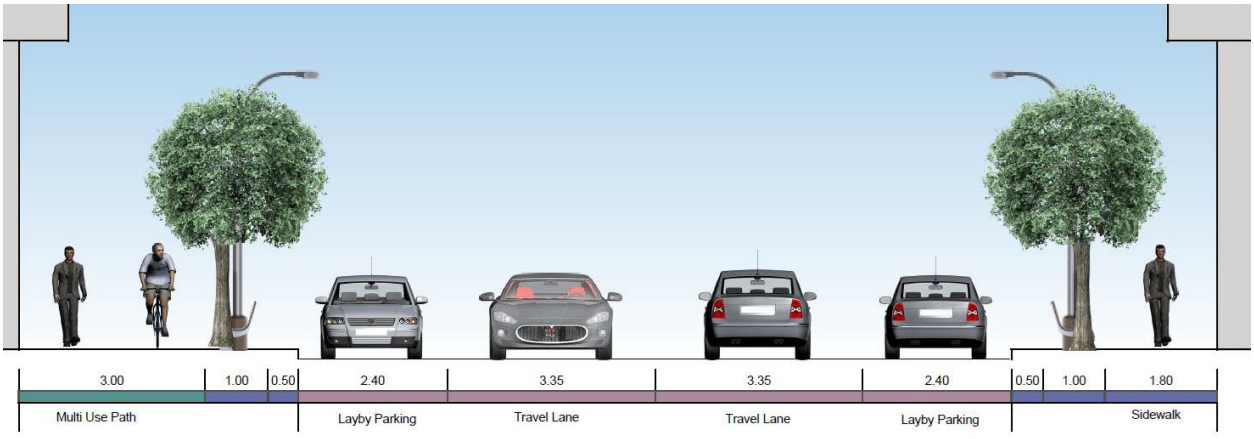
Two-Lane Urban Cross-Section with Reduced Lane Widths, Improved Sidewalk on East Side, Multi-use Path on West Side, and Streetscaping between Parking Lay-bys from Caledon Trailway to Walker Road	Two-Lane Urban Cross-Section with Reduced Lane Widths, Multi-Use Path on Both Sides, and Streetscaping between Parking Lay-bys on West Side from Caledon Trailway to Walker Road	Two-Lane Urban Cross-Section with Reduced Lane Widths, Sidewalk and Cycle Track on Both Sides, and Streetscaping between Parking Lay-bys on West Side from Caledon Trailway to Walker Road
Preferred in EA due to greater separation between bike and travel lanes, and minimum loss of parking **(Note not preferred from cycling perspective)**	**Not Preferred in EA (less preferred than multi-use path on one side) due to loss of east side parking** **(Note not preferred from cycling perspective)**	**Not Preferred in EA due to construction complexity, and loss of east side parking** **(Note preferred from cycling perspective if cost is acceptable)**
More preferred than bike lanes due to more separation between recreational cyclists and motorized traffic, and less preferred than cycle tracks due to less comfort for recreational and utilitarian cyclists from high pedestrian activity, direct business frontages, frequent driveways, and parking activity.	More preferred than bike lanes due to more separation between recreational cyclists and motorized traffic, and less preferred than cycle tracks due to less comfort for recreational and utilitarian cyclists from high pedestrian activity, direct business frontages, frequent driveways, and parking activity.	Preferred over bike lanes and multi-use path(s) due to enhanced separation between all road users. However, construction complexity and cost of burying utilities is significantly higher than other alternatives.
This alternative is preferred if parking removal on east side is not desired to accommodate multi-use paths or cycle tracks on both sides, and due to moderate construction complexity and cost. The Town of Caledon and some of the Public have indicated a preference to maintain on-street parking to support businesses and road character. Although on-street parking appears to be utilized often as a convenient alternative to available off-street parking, it is considered by the Town of Caledon as part of the Caledon East streetscape. Presently, there are minor opportunities for parking replacement in Caledon East.	This alternative is not preferred if parking removal on east side is not desired to accommodate multi-use paths on both sides. The Town of Caledon and some of the Public have indicated a preference to maintain on-street parking to support businesses and road character. Although on-street parking appears to be utilized often as a convenient alternative to available off-street parking, it is considered by the Town of Caledon as part of the Caledon East streetscape. Presently, there are minor opportunities for parking replacement in Caledon East.	Further, this alternative is not preferred if parking removal on east side is not desired to accommodate cycle tracks on both sides. The Town of Caledon and some of the Public have indicated a preference to maintain on-street parking to support businesses and road character. Although on-street parking appears to be utilized often as a convenient alternative to available off-street parking, it is considered by the Town of Caledon as part of the Caledon East streetscape. Presently, there are minor opportunities for parking replacement in Caledon East.

Based on the results of the evaluation and consultation, the preferred alterative is design alternative 4, two-lane urban cross-section with reduced lane widths, improved sidewalks on the east side, multi-use path on the west side and streetscaping between parking lay-bys from Caledon Trailway to Walker Road (

Figure 25). This alternative is more preferred than the alternative with bike lanes because it provides more separation between recreational cyclists and motorized traffic. It is less preferred than the alternative with cycle tracks due to less comfort for recreational and utilitarian cyclists from high pedestrian activity, direct business frontages, frequent driveways, and parking activity. The cross-section in Figure 25 represents layby parking with streetscaping so the trees shown may be set back further from the viewpoint and not necessarily on the splashpad. Small trees currently exist along the splashpads of the constrained right of way (north of Hilltop Drive and along Old Church Road).

This alternative was preferred among the alternatives as parking removal on the east side was not desired to accommodate multi-use paths or cycle tracks on both sides, and due to moderate construction complexity and cost. The Town of Caledon and some members of the public have indicated a preference to maintain on-street parking to support businesses and road character. Although on-street parking appears to be utilized often as a convenient alternative to available off-street parking, it is considered by the Town of Caledon as part of the Caledon East streetscape. Presently, there are minor opportunities for parking replacement in Caledon East.

Figure 25: Preferred Design Alternative - Urban Area

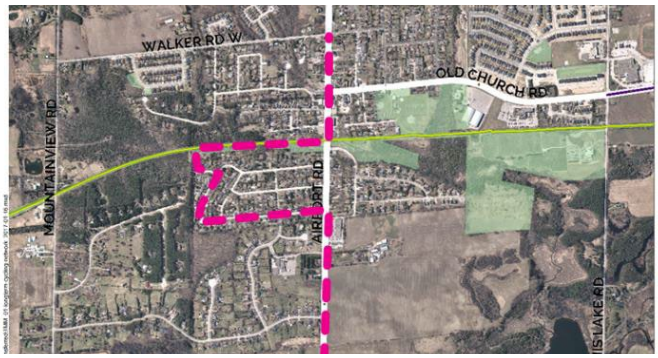


Two options were considered for a cycling detour around the highly constrained Airport Road corridor from south of Hilltop Drive to the Caledon Trailway: Signed bike route through the west neighbourhood or signed bike route through the east neighbourhood as illustrated in Figure 26. The south end of the east route is subject to the proposed development plan in the area. In the end, the east detour route along Mountcrest Drive was chosen due to having a shorter and more direct parallel route than

potential options on the west side. The signed bike route through the east neighborhood south of Caledon Trailway provides connectivity, bypassing the narrow portion of corridor.

Figure 26: Alternative Cycling Routes – South of Hilltop Drive to Caledon Trailway

Alternative Route: Potential Cycling Detour through West Neighbourhood



Preferred Route: Potential Cycling Detour through East Neighbourhood

7.3.3 Transitional Area

Olde Base Line Road to Hilltop Drive

Five design alternatives were considered for the area between Olde Base Line Road and Hilltop Drive as described above. Detailed evaluation tables are included in Appendix O and a summary is provided in Table 21. A combination of alternatives is preferred for this Area as described below.

Table 21: Summary Evaluation of Alternative Corridor Designs - Olde Base Line Road to Hilltop Drive

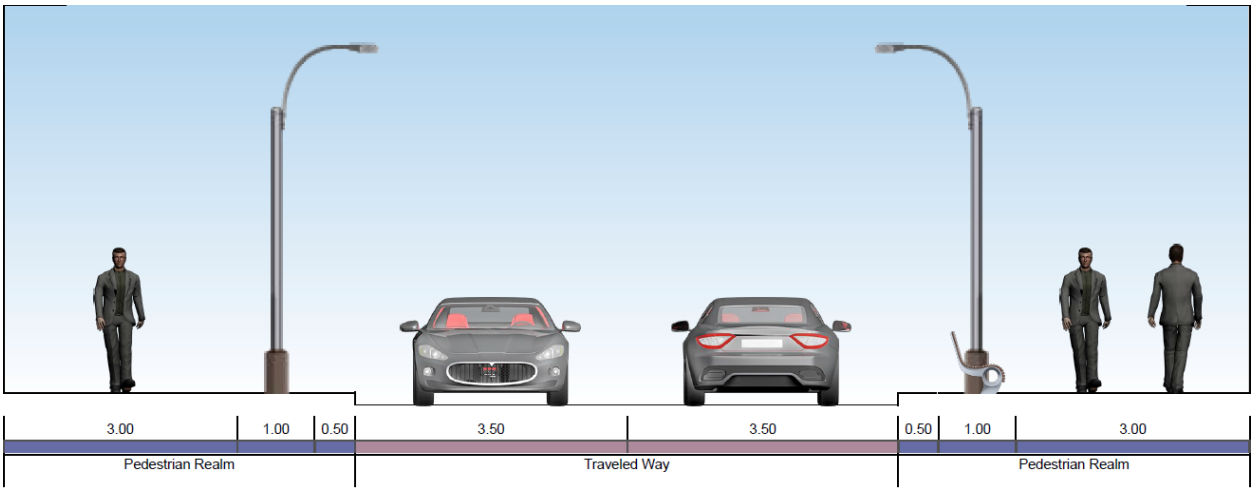
Criteria \ Alternatives	Do Nothing	Reduced Lane Widths with Paved Shoulders and Rumble Strips	Reduced Lane Widths, Sidewalks and On-Street Buffered Bike Lanes
	Not Carried Forward	Preferred in EA for the rural section between Olde Base Line Road and Cranston Drive	Not Preferred in EA due to less separation between bike lane and travel lane
Summary	Does not address problem and opportunity (included for comparison)	Provides a functional cycling and walking facility adjacent to predominately agricultural land uses between Olde Base Line Road and Cranston Drive (provides improved conditions for cycling and walking in rural area compared to existing). Low cost to construct compared to other alternatives.	Continuous with cycling facilities proposed in rural and urban areas. However, separation between bike lane and travel lane is less compared to other alternatives; and bike lanes are anticipated to be less comfortable for recreational cyclists. The cost to construct is anticipated to be higher than other alternatives, with moderate cost to operate and maintain.

Criteria \ Alternatives	Reduced Lane Widths, Sidewalk on East Side and Multi-use Path on West Side	Reduced Lane Widths and Multi-Use Paths
	Not Preferred in EA due to less separation between bike and travel lanes on east side	Preferred in EA for the urban section between Cranston Drive and south of Hilltop Drive
Summary	Semi-continuous pedestrian and cycling facilities between rural and urban area, and fills sidewalk gap between Cranston Drive and south of Hilltop Drive. More desirable than bike lanes for recreational cyclists with wide separation between cyclists and motorized traffic. Less cost to construct than bike lanes with moderate operations and maintenance costs compared to other alternatives. Less preferred than multi-use path on both sides due to less separation between bike and travel lanes on east side.	Non-continuous pedestrian and cycling facilities between rural and urban area, however fills sidewalk gap between Cranston Drive and south of Hilltop Drive. More desirable than bike lanes for recreational cyclists with wide separation between cyclists and motorized traffic. Less cost to construct than bike lanes with moderate operations and maintenance costs compared to other urban alternatives.

Based on the results of the evaluation and consultation, the preferred alternative for the more rural section between Olde Base Line Road and Cranston Drive is design alternative 2, reduce lane widths with paved shoulders and rumble strips (Figure 24). For this section, this preferred alternative provides a functional cycling and walking facility adjacent to predominately agricultural land uses between Olde Base Line Road and Cranston Drive (i.e., provides improved conditions for cycling and walking in rural area compared to existing). The cost of constructing this alternative is also low cost compared to the other alternatives.

The preferred alternative for the more urban section between Cranston Drive and Hilltop Drive is design alternative 5, reduced lane widths and multi-use paths (Figure 27). For this section, the preferred alternative provides non-continuous pedestrian and cycling facilities between the rural and urban area, however it fills the sidewalk gap between Cranston Drive and south of Hilltop Drive. The alternative is more desirable than the alternative with bike lanes for recreational cyclists with a wide separation between cyclists and motorized traffic. The construction cost of this alternative is less than the alternative with bike lanes with moderate operations and maintenance costs compared to the other urban-type alternatives.

Figure 27: Preferred Design Alternative – South of Cranston Drive to South of Hilltop Drive



Walker Road to Leamster Trail

Three design alternatives were considered for the area between Walker Road and Leamster Trail as described above. Detailed evaluation tables are included in Appendix O and a summary is provided in Table 22.

Table 22: Summary Evaluation of Alternative Corridor Designs - Walker Road to Leamster Trial

Criteria \ Alternatives	Do Nothing	Reduced Lane Widths with Multi-Use Path on West Side and Paved Shoulder and Rumble Strip on East Side	Reduced Lane Widths with Multi-Use Path on West Side and New Sidewalk and Buffered Bike Lane on East Side
Transportation	**Not Preferred**	**Preferred**	**Preferred**
	• No change to traffic operations and safety	• Acceptable traffic operations with reduced lane widths to encourage slower traffic speeds, which in turn may encourage truck diversion	• Acceptable traffic operations with reduced lane widths to encourage slower traffic speeds, which in turn may encourage truck diversion
	• No change to emergency response time	• Two-way roads with raised centre median provide less sufficient space for emergency vehicles	• Two-way roads without raised centre median provide sufficient space for emergency vehicles
Natural Environment	**Neutral**	**Preferred**	**Not Preferred**
	• No change to natural heritage features and wildlife and wildlife habitat	• Encroaches into minimum protection zones and rare vegetation community; Potential indirect impacts to Butternut Tree	• Encroaches into minimum protection zones and rare vegetation community; Potential indirect impacts to Butternut Tree
	• No opportunity to enhance natural heritage features and wildlife and wildlife habitat	• Partially urbanizing corridor may increase potential for vehicle-wildlife conflicts	• Urbanizing corridor may increase potential for vehicle-wildlife conflicts
Healthy Communities	**Not Preferred**	**Not Preferred**	**Preferred**
	• No opportunity to promote healthy (active) environments	• Continues to provide walkway between Walker Road and Leamster Trail	• Provides sidewalk on east side between Walker Road and Leamster Trail, however nearest crossing is at Walker Road
		• Non-continuous pedestrian and cycling facilities between rural and urban areas	• Continuity of paved buffered bike lane to paved shoulder on east side for cyclists entering rural area
		• Separation between pedestrians and cyclists	• No separation between pedestrians and cyclists
		• Wide separation between pedestrians and roadway on west side; Rumble strips deter vehicles from crossing over to shoulder on east side	• Wide separation between pedestrians and roadway on west side; Buffer (separation) between cyclists and travel lane on east side
	• No opportunity to support age friendly and accessible living	• Paved shoulders may not be comfortable for all cyclists	• Multi-use path may not be comfortable for all pedestrians and cyclists
Social, Cultural and Economic Environment	**Neutral**	**Preferred**	**Not Preferred**
	• Avoids negative impacts on cultural heritage features	Impacts to cultural heritage features can be avoided or mitigated	
	• No opportunity to improve local economic sustainability	• Potential for raised centre median with gateway feature between Walker Road and Leamster Trail	• No potential for raised centre median with gateway feature between Walker Road and Leamster Trail
	• No conflict with utility and municipal infrastructure	• Utility and municipal infrastructure to be relocated	• Utility and municipal infrastructure to be relocated; May require additional street lighting
	• No construction staging	• Minor temporary traffic impact due to construction staging	• Moderate temporary traffic impact due to staging of storm sewers
	• No construction cost	• Moderate cost to construct due to drainage	• High cost to construct due to drainage, street lighting and material
	• No change to operations and maintenance cost	• Moderate cost to operate and maintain	• High cost to operate and maintain
Summary	**Not Carried Forward**	**Preferred**	**Not Preferred**
	Does not address problem and opportunity	Suitable for transition from urban to rural area by retaining existing path on west side for northbound pedestrians and cyclists, and improving existing conditions on east side with paved shoulders for cyclists, resulting in less cost to construct and operate/maintain than alternative with multi-use path, sidewalk and bike lanes	Higher cost to construct and operate/maintain than alternative with pathway and paved shoulders

Based on the results of the evaluation, the preferred alternative is design alternative 2, reduced lane widths with multi-use path on the west side and paved shoulders and rumble strips on the east side. This alternative is suitable for the transition between the Urban and Rural Area by upgrading the existing walkway on the west side for northbound pedestrians and cyclists, and improving existing conditions on the east side with paved shoulders for cyclists, resulting in less cost to construct and operate/maintain than the alternative with multi-use path on the west side and sidewalk and bike lanes on the east side.

7.3.4 Intersections

Three alternatives were considered for five major intersections on Airport Road within the Study limits (see description of alternatives above). The intersections include Castlederg Side Road-Boston Mills Road, Olde Base Line Road, Cranston Drive, Walker Road and Huntsmill Drive. The evaluation of alternatives for these intersections is provided in Table 23.

Table 23: Evaluation of Alternative Intersection Designs - Five Locations

Alternatives / Criteria	Do Nothing	Conventional Intersection	Roundabout
Transportation			
Improves traffic operations	• Does not improve intersection operations	• Acceptable traffic operations where signals are warranted (Olde Base Line Road)	• Not warranted where traffic signals are not warranted (Castlederg Side Road / Boston Mills Road, Cranston Drive, Walker Road, Huntsmill Drive)
Improves traffic safety	• No change to traffic safety	• Effectiveness of roundabout versus intersection may decrease with one versus two lane roundabout, and/or transition from single lane roundabout to multi-lane roundabout or conventional intersection	• May encourage slower traffic speeds and therefore considered for traffic calming at Castlederg Side Road / Boston Mills Road, Olde Base Line Road, Cranston Drive, Walker Road and Huntsmill Drive
		• Greater chance for severe collisions compared to roundabout	• Reduces severity of collisions, however may increase likelihood of non-fatal collisions
		• Motorists are familiar with intersection configuration	• Motorists may not be familiar with unique roundabout treatment and will require enhanced driver education
		• May improve perceptions of safety for pedestrians and cyclists, improving comfort for crossing busy intersections	• Pedestrians and cyclists crossing a busy roundabout may prefer other nearby crossing locations where available
Encourages some trucks to use other truck routes	• No change to truck traffic	• Frequent stops may encourage truck diversion	• Slower traffic speeds may encourage truck diversion
Improves road geometrics	• No change to road alignment	• Opportunity to realign offset intersection at Castlederg Side Road / Boston Mills Road	• Eliminates offset intersection at Castlederg Side Road / Boston Mills Road Flared two-lane entry geometry to maximize capacity is unique in North American context and adds risk that capacity is constrained
Conforms to transportation planning policies and plans	• Not consistent with transportation planning policies and plans	• Consistent with transportation planning policies and plans	• Consistent with transportation planning policies and plans
Maintains emergency response time	• No change to emergency response time	• No change to emergency response time	• No change to emergency response time
		• Design will accommodate emergency vehicles	• Design will accommodate emergency vehicles
Natural Environment			
Complies with Provincial environmental planning policies	• Located within Oak Ridges Moraine (Olde Base Line Road, Walker Road, and Huntsmill Drive)	• Consistent with Oak Ridges Moraine Conservation Plan (Olde Base Line Road, Walker Road, and Huntsmill Drive within Oak Ridges Moraine)	• Consistent with Oak Ridges Moraine Conservation Plan (Olde Base Line Road, Walker Road, and Huntsmill Drive within Oak Ridges Moraine)
	• Located within Greenbelt Plan Area (Cranston Drive)	• Consistent with Greenbelt Plan (Cranston Drive within Greenbelt Plan Area)	• Consistent with Greenbelt Plan (Cranston Drive within Greenbelt Plan Area)

Alternatives / Criteria	Do Nothing	Conventional Intersection	Roundabout
Avoids or reduces negative impacts on natural heritage features and wildlife and wildlife habitat	• Avoids negative impacts on natural heritage features and wildlife and wildlife habitat	• Moderate negative impact on natural heritage features and wildlife and wildlife habitat:	• Moderate to high negative impact on natural heritage features and wildlife and wildlife habitat:
		• Minor to moderate tree removals	• Moderate to high tree removals
		• Minor loss of roadside and agricultural field communities at Castlederg Side Road / Boston Mills Road	• Moderate loss of agricultural field communities at Castlederg Side Road / Boston Mills Road and Cranston Drive
		• Minor loss of wildlife (birds) habitat at Walker Road	• Minor loss of wildlife (birds) habitat at Walker Road
		• Minor encroachment into minimum protection zone of locally significant wetland and Area of Natural and Scientific Interest at Huntsmill Drive	• Significant encroachment into locally significant wetland and minimum protection zone and Area of Natural and Scientific Interest at Huntsmill Drive
		• Minor encroachment into habitat for species of regional concern at Huntsmill Drive	• Loss of habitat for species of regional concern at Huntsmill Drive
		• No impact on species at risk and their habitat	• No impact on species at risk and their habitat
Introduces opportunity to protect and/or enhance natural heritage features and wildlife and wildlife habitat	• No opportunity to enhance natural heritage features and wildlife and wildlife habitat	• Topography limits opportunity to install new crossings to facilitate wildlife crossings	• Topography limits opportunity to install new crossings to facilitate wildlife crossings • Opportunity for additional culverts to increase passage of amphibians and small mammals under roadway between adjacent wetlands at Huntsmill Drive
Maintains or reduces risk for natural hazards	• No opportunity to reduce risk for natural hazards	• Increased impervious area contributing to stormwater runoff	• Increased impervious area contributing to stormwater runoff
		• Potential treatment for stormwater runoff	• Potential treatment for stormwater runoff
		• Sediment and erosion control plan will be applied during construction	• Sediment and erosion control plan will be applied during construction
Protects sources of drinking water	• Located within Wellhead Protection Area	• Part of corridor is located within Wellhead Protection Area	• Part of corridor is located within Wellhead Protection Area
	• Majority of corridor is within Highly Vulnerable Aquifer area	• Majority of corridor is within Highly Vulnerable Aquifer Area	• Majority of corridor is within Highly Vulnerable Aquifer Area
	• Sections of corridor are within Significant Groundwater Recharge Areas	• Sections of corridor are within Significant Groundwater Recharge Areas	• Sections of corridor are within Significant Groundwater Recharge Areas
Provides opportunity to adapt to or mitigate the effects of climate change	• No opportunity to adapt to or mitigate the effects of climate change	• Potential for low impact development may be restricted in wellhead protection areas	• Potential for low impact development may be restricted in wellhead protection areas
		• Vehicles continue to idle at all approaches of signalized intersections	• Less vehicles idle at roundabouts compared to conventional intersection

	Criteria / Alternatives	Do Nothing	Conventional Intersection	Roundabout
	Healthy Communities			
	Provides for active transportation	• Limited pedestrian crossing facilities	• Controlled crossing with crosswalks and/or cross rides may facilitate pedestrian and cyclist crossings	• Shared crossing for pedestrians and cyclists, although cyclists may need to dismount and walk their bikes at the roundabout
Promotes healthy, age-friendly and accessible environments	Reduces risk of chronic conditions through active transportation	• Limited active transportation facilities	• Continuous facility crossing for pedestrians and cyclists is dependent on corridor alternatives	• Continuous facility crossing for pedestrians and cyclists is dependent on corridor alternatives
			• Crosswalks and Crossrides may not provide wide separation between pedestrians and cyclists	• Crossings do not provide separation between pedestrians and cyclists
			• Reduced lane widths to cross	• Lane widths become slightly larger at roundabout (overall walking distance to cross intersection is greater)
			• Opportunity for flared sidewalks	
			• No refuge median or pedestrian islands, although may not be necessary for two-lane intersection	• Refuge median or pedestrian island
	Supports age friendly and accessible living	• No opportunities to promote healthy, age-friendly and accessible environments	• Complies with Accessibility for Ontarians with Disabilities Act	• May be challenging to cross for pedestrians with visual impairments with different auditory or tactile cues than signalized intersections
	Reduces risk of respiratory and cardiovascular outcomes associated with exposure to traffic related air pollution	• Avoids air quality impacts	• Air quality impacts are similar to air quality impacts of future no-build scenario	• Air quality impacts are similar to air quality impacts of future no-build scenario
			• Increased dust during construction will be controlled by an Emissions Management Plan	• Increased dust during construction will be controlled by an Emissions Management Plan
	Avoids or reduces noise impacts	• Avoids noise impacts	• Future sound levels are predicated to exceed threshold (60dba) at some sensitive receptors • Noise barriers will be implemented where warranted	• Future sound levels are predicated to exceed threshold (60dba) at some sensitive receptors • Noise barriers will be implemented where warranted
			• Increased noise during construction will be controlled by Construction Code of Practice	• Increased noise during construction will be controlled by Construction Code of Practice
	Social, Cultural and Economic Environment			
	Conforms to Municipal planning policies and community plans	• Not consistent with Municipal planning policies and community plans	• Consistent with Municipal planning policies and community plans	• Consistent with Municipal planning policies and community plans
	Compatible with existing and planned future land uses	• No impact on existing and planned future land uses	• Compatible with existing and planned future land uses	• Compatible with existing and planned future land uses
	Avoids or reduces property impacts	• Avoids property impacts	• Moderate to high property impacts	• High property impacts

Alternatives / Criteria	Do Nothing	Conventional Intersection	Roundabout
Avoids or reduces negative impacts on cultural heritage features	• Avoids negative impacts on cultural heritage features	• Most major intersections adjacent to identified cultural heritage resources (2 designated under Part IV of the Ontario Heritage Act)	• Most major intersections adjacent to identified cultural heritage resources (2 designated under Part IV of the Ontario Heritage Act)
		• Stage 2 Archaeological Assessment required in areas beyond disturbed right-of-way	• Stage 2 Archaeological Assessment required in areas beyond disturbed right-of-way
Supports goods movement	• Airport Road is a goods movement corridor	• Airport Road will remain as a goods movement corridor	• Airport Road will remain as a goods movement corridor
		• Design will accommodate transport trucks	• Design will accommodate transport trucks
Supports local economic sustainability	• No opportunity to improve local economic sustainability	• No impact on customer access	• Potential impact on customer access to business frontages at Olde Base Line Road
	• Avoids impacts to on-street parking	• Minor to moderate parking loss:	• Moderate to high parking loss:
		• No loss of parking spaces at Olde Base Line Road	• Potential for loss of parking spaces at Olde Base Line Road
		• Loss of side street parking at Walker Road	• Loss of side street parking at Walker Road
	• No opportunity to improve streetscape and aesthetics	• Potential for improvement to streetscape and aesthetics	• Potential gateway features at Cranston Drive and Walker Road
	• Sections between north of King Street and north of Boston Mills Road, and south of Cranston Drive and Hilltop Drive are located within Prime Agricultural Area	• No impact on Prime Agricultural Areas	• Encroaches into Prime Agricultural Area at Castlederg Side Road / Boston Mills Road and Cranston Drive
		• Design will accommodate commercial trucks and farm vehicles	• Design will accommodate commercial trucks and farm vehicles
Reduces complexity of construction	• No conflicts with utilities and municipal infrastructure	• Potential utility relocation or impacts	• Utility relocation
	• No construction staging	• Minimal and temporary traffic impacts due to construction staging	• Temporary road detours may be required for staging
	• No construction cost	• Significantly less cost to construct than roundabout due to less staging, complexity and property impacts	• Significantly greater cost to construct than conventional intersection due to temporary road detours and property impacts
	• No change to operations and maintenance cost	• Greater ongoing cost to operate and maintain than roundabout	• Less ongoing cost to operate and maintain than conventional intersection
Evaluation			
	Not Carried Forward	**Preferred at Olde Base Line Road, Walker Road & Huntsmill Drive**	**Preferred at Castlederg / Boston Mills Side Road & Cranston Drive**

Alternatives / Criteria	Do Nothing	Conventional Intersection	Roundabout
Summary	Does not address problem and opportunity (included for comparison)	Effective in improving operations. Property is a constraint for roundabouts.	Provides traffic calming corridor in combination with roundabouts south of Study Area, slowing northbound traffic toward Caledon East. Roundabout eliminates offset intersection at Castlederg / Boston Mills Side Road and provides opportunity for gateway feature at Cranston Drive.

Clarification per updated existing environmental conditions: Under local economic sustainability, lands designated as Prime Agricultural Areas abut Airport Road from north of King Street to Castlederg Side Road, interspersed from Castlederg Side Road to Olde Base Line Road, and from Olde Base Line Road to the south limit of Caledon East (south of Cranston Drive).

Based on the results of the evaluation and consultation, the preferred alternative includes two roundabouts: one at Castlederg Side Road-Boston Mills Road and one at Cranston Drive. Roundabouts at these locations are recommended to encourage slower traffic speeds and consequently some truck diversion. The effect of speed reduction may increase with the resulting 'roundabout corridor' where drivers must slow down in relative sequence from the planned roundabouts at Old School Road-Healey Road and King Street to the proposed roundabouts at Castlederg Side Road-Boston Mills Road and Cranston Drive. Although roundabouts may increase the likelihood of non-fatal collisions, they can reduce the severity of collisions. The cost to construct a roundabout is significantly higher than a conventional intersection, however the cost for ongoing operation and maintenance is less.

A conventional intersection is recommended for all other intersections considered in the evaluation.

The following sections describe the preferred designs at each intersection.

Castlederg Side Road-Boston Mills Road

A single lane roundabout is proposed at Castlederg Side Road-Boston Mills Road and Airport Road (Figure 28). The roundabout design eliminates the existing offset intersection configuration. Some property and therefore agricultural and natural environment impacts were identified that can be mitigated as described in Section 8 of this ESR. To further address safety concerns, northbound left-turn and southbound right-turn lanes are introduced on Airport Road at the commercial driveway on the west side approximately 220m north of the roundabout. Details regarding the preliminary design for this alternative are described in Section 8 of this ESR.

Figure 28: Castlederg Side Road-Boston Mills Road Roundabout

Olde Base Line Road

The first step was to consider reasonable and feasible design alternatives for the proposed intersection improvements at Olde Base Line Road. From this perspective, alternatives with major property and heritage impacts, such as widening to the west to accommodate left-turns and active transportation,

were screened from further analysis. This led to the alternatives of widening to the east and "do nothing". All alternatives generally maintained the existing centreline.

The next step was the assessment and evaluation of alternatives. In this case, one alternative was left for the impact assessment because "do nothing" was screened out during the previous evaluation of planning solutions and was included here for comparison purposes only. As a result, the technically preferred alternative was to widen to the east to accommodate the northbound left-turn on Airport Road.

Two mitigation options were considered to reduce significant property, business and heritage impacts:

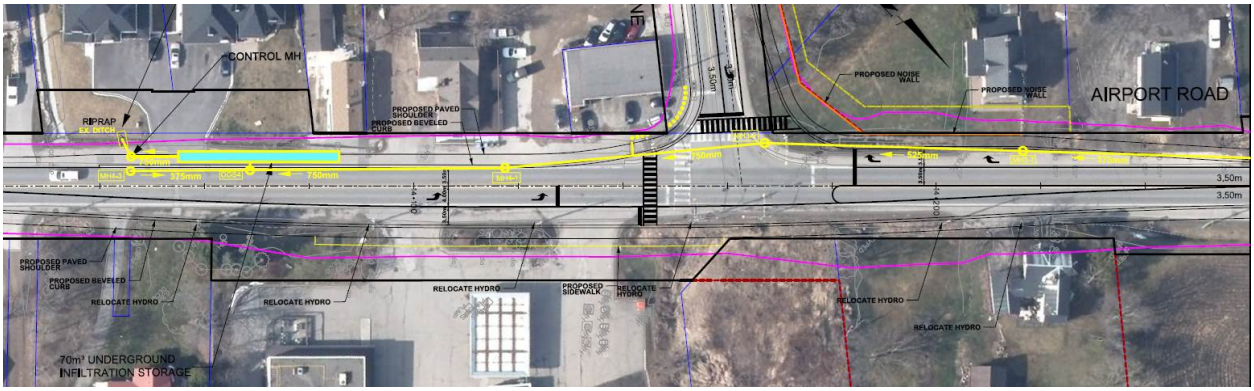
- Shifting the intersection northeast was considered not reasonable or feasible given that this shift would result in significant heritage, property and utility impacts.
- Shifting the intersection to the north resulted in significantly less impacts to the above features and was recommended as part of the preferred design.

Although the mitigated option introduces additional property impact on the north side of Olde Base Line Road, the combined property and business impact on the south side would have been greater.

In summary, the following intersection improvements were recommended (Figure 29):

- Add northbound left-turn lane on Airport Road
- Add eastbound left-turn lane on Olde Base Line Road
- Shift Olde Base Line Road centreline to the north
- Add southbound right-turn lane on Airport Road
- Widen pavement to the east side of Airport Road

Figure 29: Olde Base Line Road Intersection Improvements



Cranston Drive

The preferred alternative is a flared two-lane entry roundabout at Cranston Drive with a controlled pedestrian crossing to the north at the Caledon East Public School exit (Figure 30). The impacts to property are focused on the east side where the ultimate right-of-way under the Official Plan is protected for a two-lane roundabout. Figure 30 also shows the Foodland plaza entrance further north where a northbound right-turn lane is proposed on Airport Road.

The flared two-lane entry geometry is a unique design proposed to maximize capacity. Motorists may not be familiar with this unique treatment and will require enhanced driver education. As an added benefit, the roundabout at this location can serve as a gateway feature, further signaling northbound drivers to slow down as they approach the roundabout and enter into Caledon East.

The traffic study shows that a one-lane roundabout marginally does not work by the year 2031, and the two-lane (flared entry) roundabout is needed by 2041. From an operational perspective, implementing a one-lane roundabout in the interim will have some risk to the Region in that widening for a two-lane roundabout may be required in five to seven years. The Region must factor in the potential for additional cost and disruption to the corridor from two closely scheduled construction periods.

It is early in the process to determine whether to phase-in the two-lane entry configuration by building an interim one-lane roundabout until such time the two-lane (flared-entry) roundabout is needed. The level of risk is dependant on whether development is anticipated to generate the traffic forecasted by 2031 or 2041. Other factors, such as the COVID-19 Pandemic, may also impact future travel patterns in a way that has yet to be determined. The Region will determine the phasing of works during the detailed design phase, when the anticipated timing of forecasted traffic volumes will be better understood.

Moving forward, the EA will protect for the two-lane (flared-entry) roundabout and the Region will meet with the Town of Caledon during detailed design to discuss proceeding with one or two lanes at that time. If phased-in, the operation of a one-lane roundabout may need to be revisited in the time leading up to 2041 and may require widening to a two-lane (flared entry) roundabout to convey traffic through Caledon East.

Details regarding the preliminary design for this alternative is included in Section 8 of this ESR.

Figure 30: Cranston Drive Roundabout

Walker Road

To improve road safety and traffic operations at Walker Road, the following intersection improvements were recommended (Figure 31) (all about the centreline and within the existing protected right-of-way):

- Add a pedestrian crossover on the south leg
- Add a northbound and southbound left-turn lane on Airport Road
- Add raised centre medians with gateway features to the north

Figure 31: Walker Road Intersection Improvements

A roundabout was not recommended at this location partly due to significant property and cultural heritage impacts. Centre raised medians north of Walker Road were recommended to encourage southbound drivers to slow down as they enter Caledon East. The medians can also serve a gateway feature to further signal drivers of the community ahead.

Furthermore, traffic signals are not warranted at this intersection. A controlled pedestrian crossing was added to the south leg with the type of crossing (PXO or IPS) to be determined during detailed design upon review of traffic conditions at that time. Upon consultation with the Town of Caledon, the concept of a southbound right-turn lane on Airport Road was removed from consideration to further encourage slower speeds and reduce the crossing distance for pedestrians.

The location of the centre medians north of Walker Road could be adjusted in coordination with area development.

Huntsmill Drive

To improve road safety and traffic operations at Huntsmill Drive, the following intersection improvements were recommended (on Airport Road

Figure 32) (all about the centreline and within the existing ROW):

- Add raised medians
- Narrow general traffic lanes
- Add raised curbs and splashpads at the intersection
- Add paved shoulder and rumble strips outside of intersection
- Add northbound right (slip) lane on Airport Road

Figure 32: Huntsmill Drive Intersection Improvements

A roundabout was not considered to be an effective measure to reduce speed at Huntsmill Drive given the vertical road profile and significant impact to property access and environmentally sensitive areas. Traffic signals were also not warranted at this intersection. Centre raised medians and reduced lane widths were proposed to encourage southbound drivers to slow down as they approach Caledon East.

Old Church Road

At the intersection of Old Church Road and Airport Road, eight options were evaluated against a number of criteria to determine potential positive and negative impacts related to transportation, natural environment, healthy communities, and the social, cultural, and economic environment.

The options were grouped based on the type of improvements proposed: six involved modifying the existing driveway access while 2 involved extending Old Church Road through the 16000 Airport Road property to connect to Ivan Avenue.

As mentioned in Section 4, 16000 Airport Road was identified as a potential cultural heritage resource. To determine the extent of the property's cultural heritage value, a Heritage Impact Assessment (HIA) was completed, which is further described in Section 8. The HIA determined that the property has cultural heritage value and could be a candidate for designation under the Ontario Heritage Act, which was factored into the evaluation.

The detailed evaluation table is included in Appendix O and the results of the evaluation are summarized in Table 24.

Table 24: Summary Evaluation of Alternative Intersection Designs - Old Church Road

Alternatives		Evaluation Summary	Recommendation
Do Nothing	**No improvements**	Does not address problem & opportunity	**Not carried forward**
Modify Driveway Access	**Restrict Access to Right-In and Right-Out**	Not geometrically feasible with raised curb and not effective through signage alone	**Not carried forward**
	Restrict Access to One-Way	Not preferred due to potential traffic and economic impacts	**Not Preferred**
	Close Access (without land acquisition)	Not preferred due to potential traffic and economic impacts	**Not Preferred**
	Close Access (with land acquisition)	Not preferred due to limited benefits to road network	**Not Preferred**
	Relocate Access to the North (on adjacent properties)	Not preferred due to potential access restrictions and land development constraints	**Not Preferred**
	Signalize Driveway Access with Split Phasing	Not preferred due to increase in traffic delay / congestion at intersection	**Not Preferred**
Extend Old Church Road & Relocate/Remove Building at 16000 Airport Road	**Extend Old Church Road to Ivan Avenue and Relocate Building**	Transportation and safety benefits with heritage preservation through built heritage relocation at higher cost than removal	**Carried Forward (heritage mitigation subject to further analysis)**
	Extend Old Church Road to Ivan Avenue and Remove Building	Transportation and safety benefits with heritage preservation primarily through re-use and/or record-keeping of heritage features at lower cost than relocation	

Based on the evaluation presented at PIC No. 2, it was initially recommended that Old Church Road be extended to connect to Ivan Avenue with additional assessment of options to mitigate impact to the heritage building at 16000 Airport Road.

Following PIC No. 2, the option to extend Old Church Road to Ivan Avenue was re-evaluated based on consultation with the public, Town of Caledon and the Town's heritage advisory committee. Two options remained:

- Close access (existing option), or
- Align the west leg in the form of a driveway (new option)

Given the potential traffic and economic impacts of closing the access, the option to align the west leg in the form of a driveway was carried forward for consideration. In consultation with the Town of Caledon, it was determined that this option would be subject to a holistic study for potential future land development in the vicinity of the intersection. The study, referred to as an "urban design review", would be carried out by the Town of Caledon in collaboration with the Region of Peel to inform the ultimate solution for the west leg of the Old Church Road intersection.

Under this EA, Old Church Road will not be connected at Ivan Avenue. The Town of Caledon will undertake a separate urban design review for the broader area. The Region will continue to work with the Town through this review on possible future private access options at the intersection. Public consultation and heritage mitigation will be included in the scope of this future urban design review.

7.4 Summary of Preferred Design Concept

Based on the evaluation and consultation, a combination of design concepts were selected to improve traffic operations and corridor safety, provide for active transportation, and in turn encourage some of the heavy truck traffic to use alternative truck routes.

In summary, the following speed reduction measures are proposed:

- Reduced lane widths throughout most of the Airport Road Study corridor to reduce speeds
- Roundabouts at Castlederg Side Road-Boston Mills Road and Cranston Drive with opportunity for a gateway feature at Cranston Drive
- Layby parking with enhanced streetscaping from Caledon Trailway to Walker Road
- Raised centre medians north of Walker Road and at Huntsmill Drive with opportunities for a gateway feature north of Walker Road

The following active transportation improvements are proposed:

- Improved cycling and pedestrian crossings at all intersections with a multi-use path, including two controlled pedestrian crossings (one north of Cranston Drive and one at Walker Road)
- Active transportation facilities upgraded throughout the Study corridor (combination of multi-use paths and sidewalks in urban areas and paved shoulders in rural areas)
- Improved sidewalk on the north side and new multi-use path with crossrides on the south side of Old Church Road from Airport Road to Marilyn Street. The multi-use path will fill the gap in active transportation along this section of road, and improve access to parks and destinations predominately located on the south side.

Other operational improvements include new turn lanes at Olde Base Line Road and Walker Road; and an improved right-turn (slip) lane at Huntsmill Drive.

8. PROJECT DESCRIPTION

The preliminary design for improvements to Airport Road from 100m north of King Street to 300m north of Huntsmill Drive, and Old Church Road from Airport Road to the eastern intersection of Marilyn Street, is included in Appendix P. The following sections describe key features of the preliminary design.

8.1 Road Design

Airport Road Segment	Preliminary Design
100m north of King Street to approximately 140m south of Cranston Drive	Reduced lane widths from 4.0m or greater to 3.5m (total 7.0m vehicular pavement width) to encourage speed reduction. 2.0 to 2.5m wide paved shoulders on both sides of the road to encourage active transportation. Total 12.0m pavement width plus 1m of rounding on each side.
South of Olde Base Line Road	Curbs will be adjusted to beveled curbs in the commercial area immediately south of Olde Base Line Road to encourage speed reduction.
Approximately 140m south of Cranston Drive to approximately 140m south of Hilltop Drive	Reduced lane widths from 4.0m or greater to 3.5m to encourage speed reduction. 3.0m wide multi-use paths with streetlighting on both sides of the road to encourage active transportation. Varied boulevard for trees, streetscaping, rest areas and streetlighting, with 1.0m splashpad on both sides of the road.
Caledon East Public School exit to Mountcrest Road	Signed on-road cycling detour (in coordination with the Town of Caledon) from the future development access on the east side, opposite the Caledon East Public School exit, northerly via Mountcrest Road to Airport Road, approximately 40m south of the Caledon Trailway.
Approximately 140m south of Hilltop Drive to Mountcrest Road	Road resurfacing. Sidewalk and streetlighting replacement on both sides of the

Airport Road Segment	Preliminary Design
	road.
Mountcrest Road to the Caledon Trailway crossing	The approximate 40m section between Mountcrest Road and the Caledon Trailway will provide for a multi-use path on the east side and a sidewalk on the west side to allow for cyclists to cross at the Trailway and continue north using the multi-use path on the west side.
Caledon Trailway crossing to Walker Road	Reduced lane widths from 3.6m to 3.35m to encourage speed reduction. Raised curbs that accommodate bulb-outs for layby parking on both sides of the road to encourage speed reduction. 3.0m wide multi-use path on the west side and 1.8m (wider) sidewalk on the east side of the road to encourage active transportation. 2.4m wide on-street layby parking with streetscaping on both sides of Airport Road between Emma Street and Walker Road. The number of parking spaces on Airport Road will be reduced from 38 to 25 to accommodate improvements within this segment. Streetlighting replacement on both sides of the road. Boulevard for trees, streetscaping, rest areas and streetlighting, with 0.5-1.0m splashpad on both sides of the road (between the multi-use path / sidewalk and layby parking). The horizontal road alignment of Airport Road from north of the Caledon Trailway to Parsons Avenue will be shifted approximately 0.6m to the east to accommodate for the multi-use path and layby parking on the west side. The horizontal road alignment of Airport Road from north of Old Church Road to Walker Road will be shifted approximately

Airport Road Segment	Preliminary Design
	0.9m to the east to accommodate for the multi-use path and layby parking on the west side.
Walker Road to Leamster Trail	Reduced lane widths from 4.0m or greater to 3.5m to encourage speed reduction. 3.0m wide multi-use path on the west side and 2.0m wide paved shoulder on the east side of the road to encourage active transportation. 1.0m wide splashpad on the east side.
Leamster Trail to 300m north of Huntsmill Drive	Reduced lane widths from 4.0m or greater to 3.5m (total 7.0m vehicular pavement width) to encourage speed reduction. 2.0 to 2.5m wide paved shoulders on both sides of the road to encourage active transportation. Total 12.0m pavement width plus 1.0m of rounding on each side.
Old Church Road Segment	Preliminary Design
Airport Road to Marilyn Street (approximately 500m)	3.0m wide multi-use path with crossrides on the south side and 1.8m (wider) sidewalk on the north side of the road to encourage active transportation. 2.4m wide on-street layby parking with streetscaping where feasible on the south side from Airport Road to Greer Street to encourage speed reduction.

8.2 Intersection Design

Intersections	Preliminary Design
Airport Road and Castlederg Side Road-Boston Mills Road	One lane roundabout (55m diameter) to alleviate the offset intersection and provide traffic calming.

Intersections	Preliminary Design
Airport Road and Olde Base Line Road	New northbound left-turn lane on Airport Road. New southbound right-turn lane on Airport Road. New eastbound left-turn lane on Olde Base Line Road. Realignment of west leg approximately 3.5m to the north to accommodate the eastbound left-turn lane on Olde Base Line Road. Pavement widening to the east to accommodate the northbound left-turn lane on Airport Road. Improved crosswalks on the west and south legs.
Airport Road and Cranston Drive	Flared two-lane entry roundabout (52m diameter). Opportunity for gateway feature on the roundabout for northbound drivers approaching Caledon East.
Airport Road and School Exit (south of Foodland Plaza)	Controlled pedestrian crossing with pushbutton.
Airport Road and Old Church Road	West leg (driveway access) will be subject to a separate urban design study by the Town of Caledon. Crossride on the south leg and improved crosswalks on the south, east and north legs.
Emma Street Parsons Avenue	Crossride on the west leg.
Airport Road and Walker Road	Controlled pedestrian crossing with pushbutton on the south side of the intersection. Crossride on the west leg and improved crosswalks on the south and west legs. New northbound and southbound left-turn lanes on Airport Road. Series of 3 raised centre medians north of Walker Road to encourage slower speeds for southbound drivers. Opportunity for gateway feature on top of the median(s) for southbound drivers approaching Caledon East.

Intersections	Preliminary Design
Airport Road and Huntsmill Drive	Improved northbound right-turn (slip) lane. Raised curbs for the intersection. Raised centre median at the intersection.

Accessibility features at intersections will be confirmed during detailed design and may include:

- Tactile walking surface indicators to warn people with visual disabilities at intersections and crosswalks,
- Accessible Signal Control at crosswalks with tactile directional arrows, high contrast push buttons, letterings and pictogram,
- Audible and vibro-tactile walk indicators at crosswalks, and/or
- Depressed curbs at sidewalks.

8.3 Access Management

Access	Preliminary Design
Commercial (nursery) access approximately 220m north of Boston Mills Road, on the west side of Airport Road	New northbound left-turn lane on Airport Road. New southbound right-turn lane on Airport Road.
Commercial (plaza) entrance approximately 370m north of Cranston Drive, on the east side of Airport Road	New northbound right-turn lane.
Commercial (LCBO) access at Old Church Road	Access will be subject to a separate urban design review study by the Town of Caledon.
Intersecting side-streets on the west side of Airport Road between the Caledon Trailway and Walker Road	Crossrides on the west side of Airport Road at the intersections with side-streets.

8.4 Structures

The design requires two structural crossings: one north of Huntsmill Drive (C1) and one at Centreville Creek (C3). The structures are described below and the general arrangement and staging drawings are provided in Appendix M.

Upper Huntsmill Culvert (C1)

The existing 900mm CSP culvert will be removed and replaced with a precast concrete open footing culvert with 3.658m span and 1.067m rise. The structure will be constructed perpendicular to the roadway alignment with a total length of 24.1m to accommodate a road width of 11.0m comprised of two 3.5m traffic lanes and two 2.0m paved shoulders. The maximum fill on the culvert is 1555mm and a new steel beam guiderail system will be installed on both sides of the roadway.

In general, borehole logs indicate that the site is an asphalt pavement or topsoil, underlain by compact to dense fill and a very stiff clayey silt deposit. The precast structures will be supported on conventional spread footing and founded in the clayey silt till. The bottom of the footing level will be approximately 3.4m below the existing ground surface.

Centreville Creek Bridge (C3)

The existing concrete box culvert will be removed and replaced with a new structure which will be a precast open footing culvert with 12.192m span and 1.372m rise (1.829m above invert) with a 150mm reinforced concrete distribution slab. The retaining wall will be a cast-in-place concrete or Retained Soil System (RSS) wall. A box beam railing with concrete end walls will be provided on each side of the sidewalk. The structure will be constructed perpendicular to the roadway alignment with a total length of 18.4m to accommodate the following features:

- Two 3.35m Traffic Lanes
- Two 0.65m Shoulders
- Two 1.2m Concrete Buffer Zones
- Two 3.5m Multi-Use Paths
- Two Steel Tube Railing on Sidewalks

In general, borehole logs indicate that the site is an asphalt pavement or topsoil, underlain by weak/loose peat deposits. The total settlements are expected to exceed 25mm if the structure is founded on this native soil and therefore a deep foundation is recommended. The geotechnical investigation and design report recommends Chance helical piles to support the proposed structure.

A preliminary structural assessment was carried out for the proposed structural loads and impractical footing size and number of piles were determined based on the provided geotechnical resistance values. In detailed design, further geotechnical investigations are required within the footprint of the new structure to explore the depth of competent strata capable of providing sufficient design information for feasible deep foundations design.

See Appendix M for the **Structural Inspection and Assessment Report**, including General Arrangement and Staging Drawings. Due to limited detour options and high average annual daily traffic (AADT) on Airport Road, the replacement will be carried out in stages with two traffic lanes maintained during construction.

8.5 Retaining Walls

Huntsmill Drive to Caledon Trailway

At the time of completing this ESR, the Region observed the potential need to rehabilitate the veneer on the retaining walls along Airport Road from Huntsmill Drive to the Caledon Trailway. The condition of the retaining walls will be assessed during detailed design and any improvements required will be coordinated with the improvements on Airport Road.

Old Church Road and Airport Road

Based on the Region's condition evaluation in 2016, the cast-in-place concrete retaining wall at the northwest corner of Airport Road and Old Church Road is in need of replacement. At the time, the retaining wall was recommended for replacement in 5 years based on the following observations:

- Significant deterioration at the retaining wall return, which may be attributed to freeze-thaw and movement,
- Cracking in the retaining wall, which may be attributed to differential movement, and
- Concrete scaling on top of the retaining wall, which may be attributed to freeze-thaw or salt scaling.

Two replacement options were recommended:

- Remove retaining wall and re-grade soil, or
- Replace retaining wall with a new cast in place or modular wall.

A cost-benefit analysis for the retaining wall is recommended during the detailed design phase to confirm the preferred replacement method. The replacement may be coordinated with future work on the west leg of the Old Church Road intersection, subject to the Town of Caledon's urban design review study.

8.6 Environmental Impacts, Mitigation Measures and Commitments

Impact assessments were completed to identify the recommended design's potential impact on the environment. Mitigation measures are proposed to minimize potential negative impacts and result in a net benefit to the environment. Impacts and mitigation measures are outlined in the following sections.

8.6.1 Natural Environment

The following section identifies the potential impacts of the proposed improvements on the natural environment. Mitigation measures are proposed to help minimize potential negative impacts.

Environmentally Significant Areas

The Caledon East Complex is unlikely to be impacted by the recommended design. To further reduce the potential for negative impacts, the mitigation measures outlined in this Section should be applied.

No direct or indirect impacts are expected to the Caledon East Swamp. If there are changes to the disturbance limit in detailed design, avoidance or mitigation measures should be considered.

Areas of Natural and Scientific Interest

The Innis-Gibson Lakes Kettles Candidate ANSI is outside the disturbance limit. As such, no negative impacts to this feature are anticipated. If there are changes to the disturbance limit in detailed design, avoidance or mitigation measures should be considered.

Provincially Significant Wetlands

The Provincially Significant Wetland (PSW), Widgett-Innis Lakes Wetland Complex, is outside the disturbance limit. Since no direct impacts are proposed, the greatest potential for indirect impacts to the PSW is construction-related, and includes impacts of stormwater runoff, contaminant spills, and sedimentation.

To address the potential indirect impacts, Erosion and Sediment Control (ESC) measures should be implemented:

- All ESC measures should be consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.
- Appropriate ESC measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any PSW unit.
- When native soil is exposed, ESC works, in the form of heavy-duty sediment fencing, shall be positioned along the edge of the areas to be developed, graded, and otherwise disturbed.
- Sediment fencing must be constructed of heavy material and solid posts and be properly installed to maintain integrity during inclement weather events. Additional sediment fencing and appropriate control measures must be available on site so that any breach can be immediately repaired.

- Regular inspection and monitoring will be necessary to ensure that the structural integrity and continued functioning of the sediment control measures is maintained.
- All stockpiled aggregates should be stored in a location that will prevent the movement of sediment laden runoff into the PSW units.
- All stockpiled topsoil/overburden should be stabilized as quickly as possible to minimize the potential for runoff.
- Machinery should arrive on site in clean condition and maintained free of fluid leaks.
- Machinery must be refueled, washed, and serviced a minimum of 30m from wetlands that occur near the subject property boundary on adjacent lands.
- Locate all fuel and other potentially deleterious substances a minimum of 30m from wetlands and drainage features. Minimize fuels and chemicals stored onsite and ensure a spills management plan and the associated spill response equipment is available on-site at all times for implementation in the event of a spill of deleterious material.
- Temporary storage locations of aggregate/fill material should be located no less than 30m from wetlands and drainage features. This material is to be contained by heavy-duty sediment fencing.
- Offloading of construction and aggregate/fill materials should be completed during fair weather conditions.

Locally Significant Wetlands

The Locally Significant Wetlands (LSWs), Caledon East Wetland Complex, and Mono Road Wetland Complex, are outside the disturbance limit. Since no direct impacts are proposed, the greatest potential for indirect impacts to the LSW is construction-related, and includes impacts of stormwater runoff, contaminant spills, and sedimentation.

To address the potential indirect impacts, the ESC measures outlined above should be implemented.

Unevaluated Wetlands

The majority of the unevaluated wetland communities are outside the disturbance limit. However, a single wetland community located at the intersection of Airport Road and Olde Base Line Road will experience direct loss. Approximately 165m^2 of the Forb Mineral Meadow Marsh will have to be removed. This wetland community is not associated with any documented Flora or Fauna Species of Concern by TRCA. TRCA documented a Fauna Species of Regional Concern (L3) within this wetland; however, the actual species is not listed. Compensation measures to result in no net wetland loss will be discussed as part of the permitting process.

Trees and Natural Vegetation Communities

The recommended design has the potential to result in impacts to tree resources within the corridor. A tree inventory was undertaken to determine how many trees would be removed. A total of 92 trees require removal to implement the recommended design. This number does not include the dead trees that require removal due to safety issues.

The only identified SAR tree within the Study Area is the Butternut Tree, which is protected by the Ontario Endangered Species Act (ESA, 2007). However, no direct impacts are anticipated.

To mitigate impacts, the following measures are proposed:

- Tree protection fence should be placed along the perimeter of the edge of disturbance.
- Replacement of trees should occur consistent with a landscaping plan containing native species suitable to site conditions.
- Following completion of the project works any disturbed and/or exposed soil should be stabilized and revegetated via a native seed mixture suitable to site conditions. The seed mix should be consistent with CVC/TRCA Plant Selection Guidelines.
- Prior to applying the seed mix, prepare the areas to be seeded by eliminating uneven areas and low spots, removing weeds to the extent achievable, and removing branches and stones in excess of 50mm.
- In areas of slopes greater than 3:1, jute mat, Bonded Fibre Matrix or equivalent shall be laid on top of the seed mix to further stabilize disturbed soils in these areas. Where slopes are less than 3:1, seeding and mulch should be used to stabilize disturbed soils.
- All necessary vegetation removal (e.g., tree/shrub clearing, etc.) should be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). If limited vegetation removal must occur early during this period (i.e., between April 1-April 15), a nest

survey should be conducted by a qualified biologist within five days of commencement of vegetation removal activities to identify and locate active nests of bird species covered by the federal Migratory Bird Convention Act, 1994 or provincial Fish and Wildlife Conservation Act, 1997. If a nest is located or evidence of breeding noted, a mitigation plan should be developed to avoid any potential impacts on birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.

During detailed design, the number of trees to be removed may be further refined. At this time, the number of replacement trees should be determined using the TRCA tree replication ratio (Table 25).

Table 25: Individual Tree Replacement

DBH Range (cm)	Replication Ratio
0 – 10	1:1
10.1 – 20	1:3
20.1 – 30	1:10
30.1 – 40	1:15
40.1 – 50	1:20
50.1 – 60	1:30
60.1 – 70	1:40
70.1 +	1:50

DBH – Diameter at Breast Height

Endangered and Threatened Species Habitat

In total, six Endangered / Threatened species may be present in the Study Area: two birds, three bats, and one tree.

Birds

Habitat does not appear to be a limiting factor for the two bird species that may be present in the Study Area: Barn Swallow and Bobolink. Numerous agricultural lands are present and will continue to provide habitat. The proposed improvements do not extend into the identified agricultural communities and therefore have a limited likelihood of damaging or destroying habitat for these species. Additionally, as Bobolink are known to avoid selecting edge habitat for nesting, the likelihood of this species being impacted is further reduced.

To mitigate impacts, the following measures are proposed:

- During detailed design, if the footprint of disturbance is proposed to encroach into potential habitat for Bobolink, additional targeted surveys for this species may be required.
- During detailed design, all existing culverts shall be reviewed to ensure that Barn Swallows are not actively nesting in any of these structures.
- Should Barn Swallow be encountered nesting in a culvert, staff from MECP should be contacted to obtain direction on how to proceed.

Bats

Three bat species have the potential to be present within the northern, forested portion of the Study Area. While no suitable hibernation habitat was identified within the Study Area, the forest cover present in the northern portion of the Study Area has the potential to contain suitable trees for roosting. Avoidance of roosting habitat will minimize the potential for individual Endangered bats and their summer roosting habitat to be negatively impacted by the recommended design.

To mitigate impacts, the following measures are proposed:

- Tree removal only occur within the Study Area between October 1 and May 1 to avoid the active roosting season for endangered bat species.
- The extent of tree removal within the Study Area be limited to the extent possible.
- Should tree removal of entire stands of trees be identified as a requirement during detailed design, MECP should be contacted to determine if a permit under the ESA is required.
- If any suitable anthropogenic roosting structures are proposed for removal, exit surveys to confirm presence or absence of SAR bats may be required at the design stage.

Trees

The Butternut tree identified within the Study Area is located approximately 30m from the edge of disturbance. Direct impacts are unlikely.

During detailed design, a formal health assessment of the identified Butternut shall be completed to determine if measures are required to protect this individual to ensure compliance with the Provincial ESA (2007).

Terrestrial Waterfowl Stopover and Staging Areas

Terrestrial Waterfowl Stopover and Staging Areas may be present within the Study Area. Minimal encroachment into existing field communities is expected to occur due to the recommended design.

Given the extent of encroachment, the potential for negative impacts as a result of lost field communities within the Study Area is minimal suggesting that these communities will continue to function as terrestrial Waterfowl Stopover and Staging Areas.

To mitigate impacts, the following measures are proposed:

- Development and site alteration within field communities found to contain standing water in the spring, should not occur until water levels have receded.
- Grading plans must ensure that alteration to field margins will not result in substantial draining of surface water from these communities.

Bat Maternity Colonies

As outlined above, the Study Area contains several potentially suitable maternal roosting sites for Big Brown Bat and Silver-haired Bat. The impacts to potential roosting habitat for bats within the Study Area were considered as part of the assessment for Endangered bat species. The mitigation measures outlined in this Section are anticipated to maintain the ecological features and functions as they relate to Bat Maternity Colonies.

Turtle Wintering Areas

Based on the information provided by TRCA, larger wetland and river communities within the Study Area have the potential to function as overwintering habitat for turtles. Land clearing, changes to water levels, water quality, and alterations to the thermal regime can negatively impact the potential overwintering habitat for turtles. Additionally, maintaining access to overwintering areas by turtles is important.

To mitigate impacts, the following measures are proposed:

- In general, a 30m buffer from wetland communities within the Study Area must be maintained.
- Vegetation within the 30m buffer is to remain in a natural state.
- Water balance within wetlands is to be maintained to ensure suitable water levels for hibernation are present and ensure consistency with the Centreville Creek Subwatershed Study (TRCA 2003).
- Where construction activities are proposed in proximity to wetland communities, suitable exclusion fencing must be erected to prevent sediment from entering wetlands or their associated buffers.

- Where possible, enhancement of existing wetland buffers, between wetlands and the existing roadway should be considered.
- Wetland removal should occur in late summer during periods of low water levels to minimize impacts.

Sand Barrens

The Sand Barren Community is outside the disturbance limit. Since no direct impacts are proposed, the greatest potential for indirect impacts is construction related.

To mitigate impacts, the following measures are proposed:

- Prior to the onset of construction, the edge of the Treed Sand Barren Community proximate to Airport Road shall be isolated using standard sediment and erosion control practices.
- No disturbance or site alteration is to occur within the Treed Sand Barren Community.
- No plantings or installation of additional vegetation is to occur within this community as part of final site stabilization.

Woodland Amphibian Breeding Habitat

The recommended design avoids impacts to the extensive areas of woodland amphibian breeding habitat within the northern portion of the Study Area, therefore no direct impacts are proposed.

Wetland Amphibian Breeding Habitat

The recommended design mostly avoids wetland communities within the Study Area. As previously stated, a single wetland community located at the intersection of Airport Road and Olde Base Line Road will experience direct loss. The proposed 165m^2 loss of the Forb Mineral Meadow Marsh will result in a loss of Amphibian Breeding Habitat. It is anticipated that the remainder of the wetland community will continue to function as breeding habitat for amphibians indicating that the feature and its ecological function will be largely maintained.

To mitigate impacts, the following measures are proposed:

- All measures outlined in this Section to be adhered to.
- Direct wetland loss should be reviewed by TRCA and compensation measures to result in no net wetland loss discussed as part of the permitting process.
- In general, a 30m buffer from wetland communities within the Study Area be maintained.

- Vegetation within the 30m buffer is to remain in a natural state.
- Water balance is to be maintained to ensure suitable water levels for hibernation are present.
- Where construction activities are proposed in proximity to wetland communities, suitable exclusion fencing be erected to prevent sediment from entering wetlands or their associated buffers.
- Where possible, enhancement of existing wetland buffers, between wetlands and the existing roadway be considered.
- Wetland removal should occur in late summer during periods of low water levels to minimize impacts.

Habitat for Species of Conservation Concern (excluding Endangered / Threatened species)

Snapping Turtle, Eastern Ribbonsnake, Eastern Wood Peewee, Wood Thrush, and Monarch habitat may be present within the Study Area.

Both Snapping Turtle and Eastern Ribbonsnake are primarily associated with wetlands and aquatic communities. To mitigate impacts to Snapping Turtle and Eastern Ribbonsnake, mitigation measures outlined in this Section for PSW, Turtle, and Fish should be adhered to.

Eastern Wood Peewee and Wood Thrush are commonly found in forested communities. The proposed loss of trees may impact these species' habitat. However, the loss of minimal forest habitat is not anticipated to result in negative impacts to these species. Avoidance of vegetation removal during the active nesting season for this and other avian species will further reduce the potential for negative impacts.

To mitigate impacts, the following measures are proposed:

- The extent of tree removal within the Study Area be limited to the extent possible.
- Site alteration (i.e., felling of trees, clearing, grading, etc.) shall not occur within the Study Area between April 1 and August 31, as this time corresponds to the peak nesting/breeding period for most avian species.
- Monarch butterflies may be present within the Study Area. No breeding was documented, but this species' host plant Milkweed was noted by TRCA. Based on the extent of the recommended design, there is a low likelihood of the proposed improvements removing all of the areas containing Milkweed.

To mitigate impacts, the following measures are proposed:

- Restoration designs should consider the inclusion of Milkweed in planting plans for areas that are disturbed by construction.

Animal Movement Corridors

Deer Movement Corridors and Amphibian Movement Corridors are likely present within the Study Area. Most notably, TRCA identified areas in proximity to Huntsmill Drive, Mountcrest Road, and just north of Boston Mills Road as having the potential to contain wildlife movement corridors. Additionally, roadkill data indicate that this location is a high incident area for wildlife/motor vehicle collisions.

The area in proximity to Huntsmill Drive contains a variety of ecological communities and features that support wildlife populations (e.g., forest, wetland, watercourses). Ideally culverts in this area would be oversized to facilitate passage for the largest number of species.

The crossing in proximity to Mountcrest Road contains a large culvert; fencing or other structures could be considered in this location to enhance the existing crossing functionality.

The crossing located north of Boston Mills Road links wet portions of an agricultural field and a narrow strip of vegetation in proximity to a commercial nursery; this area extends into the Mono Road Wetland Complex to the west. The elevated nature of the road in this location may provide opportunities to enhance movement for smaller wildlife (i.e., small mammals and amphibians).

To mitigate impacts, the following measures are proposed:

- Wildlife Crossing signage be considered at each of the locations identified by TRCA.
- During detailed design, where culvert replacements are proposed, and the general structure size permits, the following should be considered to improve the likelihood of drainage culverts functioning as movement corridors:
- The culvert should be backfilled to create a low flow channel with dry “benches” along the edges.
- Backfilling should leave a low flow channel approximately one third of the width of the culvert. This channel should meander along the length of the culvert.
- Backfilling and imbedding of the culvert should maintain a minimum of 1m of clearance between substrates and the top of the culvert.
- Boulders (300-500mm) should be placed throughout the length of the culvert on the dry “benches” at a density of 1-2 boulders per 2m of culvert length.

- CVC recommends that the openness ratio should be no less than 0.1 (ideal is 0.4 or greater).

Culvert Ends:

- Culvert ends can be constructed using either a retaining wall or wing walls; however, wing walls are preferred as they act to funnel wildlife into the culvert.
- Materials used for culvert end treatments should be relatively smooth to discourage climbing by wildlife (e.g., precast concrete).

Fencing Design:

- Fencing should be tied into the end of culvert treatment.
- Fencing should extend across the roadside ditch, away from the culvert to the edge of the road right-of-way. Keeping the fencing as far from the road as possible will minimize damage from snow removal activities.
- Where the fence crosses the ditch, the gap below the fence should be filled with rip-rap to permit water flow but exclude wildlife.
- CVC recommends that fencing be constructed of galvanized steel chain-link fencing that is 1-2m in height.
- To exclude smaller animals (mice, voles, frogs, etc.), panels of galvanized hardware cloth or similar material with a mesh size of 6mm (0.25 inches) be added to the lower 1m portion of the chain-link fencing.
- The bottom of the fencing should be buried between 0.2-0.4m underground to deter wildlife from digging under the fence.

Fish Habitat

Three crossings of Airport Road were identified as direct or indirect fish habitat. The following activities may result in impacts to fish habitat:

- Land-based construction activities such as excavation, grading, use of industrial equipment, dewatering, and vegetation clearing may result in inputs of soil/sediment, nutrients, and/or toxic substances to the drainage features during construction. They may adversely affect water

quality and fish habitat via increased turbidity, nutrient enrichment, contamination by toxic substances, changes in pH, etc.

- In-water activities required during culvert replacement, which will temporarily affect flow patterns and could result in the stranding of fish.
- Permanent alterations to channel gradients and culvert lengths.
- Potential fish passage issues if the new crossing structures are undersized.

To mitigate impacts, the following measures are proposed:

- Minimize riverbank and riverbed hardening to the extent possible (any replacement structures should be designed to maintain the existing natural substrates and gradients with an invert that allows continued fish passage).
- Where culvert replacements are required, open bottomed structures are recommended.
- Adherence to recommendations provided in this Section will help to ensure that Fish Habitat is protected from deposition of deleterious substances.
- During detailed design, a Request for Review should be submitted to the Department of Fisheries and Oceans (DFO) to demonstrate the proposed works will not result in serious harm to fish as defined by the Fisheries Act, 1985.
- All in-water and near-water works will be undertaken during the relevant fisheries timing window.
- Crossings 1, 2, 3, 4, and 7 are identified as coldwater systems and as such in-water works must be undertaken between June 15 and September 15 at these crossings.
- Crossings 5 and 6 were identified as warmwater systems and as such in-water works must be undertaken between July 15 and April 30 at these crossings.
- Vegetation within 30m of watercourses is to be maintained to minimize channel bank erosion and maintain water quality.
- All in-water works are to occur ‘in the dry’ with flows being maintained to downstream reaches of the watercourses.
- Where possible, during detailed design, increasing the diameter of the culvert at Crossing 7 should be considered.

- Where pumping is to occur, water intakes will be screened to inhibit fish from becoming entrained or impinged by the pumping activities, and the screen face must be oriented in the same direction as flow.
- A sediment and erosion control report and plan (including phasing and staging plans) is to be developed that is consistent with the Erosion and Sediment Control guidelines for Urban Construction (December 2006) and these works are to be maintained in good working order until completion of this project.
- Appropriate sediment and erosion control measures shall be employed to prevent the erosion of unstable soils and the movement of sediment and/or other deleterious substances into any watercourse. These measures shall be in place prior to the onset of site preparation.
- Upon isolation of the work area, and during draw down of water, any fish trapped within the work area will be immediately collected and moved to a suitable habitat downstream by a qualified biologist under a MNRF issued “License to Collect Fish for Scientific Purposes”.
- At construction, Fisheries and Oceans must be notified immediately if a situation occurs or if there is imminent danger of an occurrence that could cause serious harm to fish. If there is an occurrence, corrective measures must be implemented.
- Stormwater management should be designed to maintain water balance to all identified watercourses that provide fish habitat to ensure that existing levels of channel instability at sensitive sites downstream are not increased.

Headwater Drainage Features

The recommended design has limited potential to impact the HDFs at Crossing 4, 5 and 6.

To mitigate impacts, the following measures are proposed:

- No actions or recommendations are required for Crossing 4.
- At Crossing 5, replacement of functions is recommended for HUM5-C (see Appendix C).
- At Crossing 6, replacement of functions is recommended for both HUM6-B and HUM6-D (see Appendix C).

Summary

Overall, the proposed improvements have the potential to result in impacts to an unevaluated wetland, vegetation, trees, and wildlife and wildlife habitat, however no significant or rare environmental features or SAR will be impacted by the improvements.

The Study Area is largely agricultural and/or urban in nature. It is likely that wildlife have become acclimatized to the noise, light and visual conditions associated with the presence of the road and urban settings and only those that are tolerant of human activities tend to persist, therefore the proposed improvements are not anticipated to result in any long-term detriment to the natural environment. However, animal movement corridors should be enhanced, where possible.

Where negative impacts are unavoidable, mitigation measures have been proposed to limit and/or prevent adverse effects.

8.6.2 Property

Some property will be required to accommodate the proposed road improvements. Since the proposed design does not include widening for additional through traffic lanes, property impacts are generally located at intersections to accommodate the proposed improvements. Roundabouts generally require the most property.

8.6.3 Air Quality

To quantify the effects of the project on surrounding air quality, a Future No-Build and Future-Build scenario were modelled. The No-Build scenario represented Airport Road with planned build-outs to 2022, and the Future-Build scenario included the planned build-outs, plus a proposed extension of Ivan Avenue to Old Church Road, and roundabouts at Olde Base Line Road and Cranston Drive. The Future-Build scenario also included sidewalks, bike lanes and on-street parking. These configurations were assessed early in the Study to capture the potential impacts of the worse case scenario. Full details are included in Appendix E.

For both Future No-Build and Future Build scenario, vehicle emissions were represented using projected 2041 traffic volumes and 2021 vehicle emission factors, which is a maximum impact combination. The Future-Build scenario was expected to redistribute minor volumes of traffic from Emma Street and Parsons Avenue to Ivan Avenue and was expected to have an insignificant effect on traffic along Airport Road. Thus, removal of proposed features in the preferred design (e.g., removal of proposed roundabout at Olde Base Line Road, road extension at Old Church Road, and bike lanes replaced by multi-use paths or paved shoulders) will not likely affect air quality.

Air contaminants assessed included $PM_{2.5}$, PM_{10}, CO, NO_2, acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde.

Impacts

Overall, the project will have similar air quality impacts to the Future No-Build scenario, and therefore, has little implications for air quality.

The pollutant closest to its limit was benzene at 94% and 96% of the threshold for annual average concentration, in the Future No-Build and Future-Build scenarios, at the most impacted receptor location. For NO_2, the 1-hour cumulative maximum predicted concentration is less than the current ambient air quality criteria, but higher than the proposed 2020 Canadian Ambient Air Quality Standards for both the Future-Build and No-Build scenarios.

Mitigation

No mitigation is required for the Future-Build scenario. It is recommended that in order to minimize potential air quality impacts during construction, an emissions management plan should be implemented.

There are two types of construction emissions: dust from operations and emissions from construction equipment, which is typically powered by diesel engines. Such emissions will be temporary in nature and the impact is expected to be localized.

To mitigate the potential construction impacts, the following mitigation measures should be applied:

- Water to limit dust emissions from surfaces.
- Cover excavated materials or fill materials stored on site.
- Street clean to limit tracking of materials.
- Cover all trucks hauling dirt, sand, soil, or other loose materials.
- Clean all adjacent streets if visible soil materials are present due to operations.
- Install wheel washers where vehicles enter and exit the work site onto public roads.
- To minimize the potential impacts from diesel powered construction equipment, the following mitigation measures should be applied:
- Locate truck staging zones away from potential receptors.
- Minimize idling time for all diesel-powered equipment.

8.6.4 Noise

Changes in future sound levels resulting from the Project are expected to be small. However, future sound levels are predicted to exceed 60 dBA at some receptors. Full details of the noise assessment are included in Appendix F.

Mitigation

Three locations are recommended for noise barriers as part of this Project:

- Northwest corner of Airport Road and Olde Base Line Road (approximately 80m in length)
- South of Mountcrest Road on the west side of Airport Road (approximately 40m in length)
- Northeast corner of Airport Road and Walker Road (approximately 40m in length)

The approximate location of these noise walls are shown in Figure 2 of the noise assessment report in Appendix F. The location and type of noise barriers will be confirmed during detailed design.

Noise barriers were also recommended at two sites of potential future development. These locations will be confirmed through a separate development planning process. The recommendations at these locations could change in the event front facing lots are proposed.

In addition, four existing noise walls within the Project Limits will be replaced (at the right-of-way property line) and converted from "private" to "Regional" noise walls in conjunction with Airport Road construction through Caledon East. The location of these existing noise walls are shown on the Preliminary Design in Appendix P.

8.6.5 Archaeology

A Stage 1 Archaeology Assessment was completed on December 7, 2017 and October 17, 2018. The study determined that eight previously registered archaeological sites are located within one kilometre of the Study Area, two of which are within the Study Area and retain Cultural Heritage Value or Interest (CHVI). Portions of the Study Area were found to have archaeological potential. Full details are included in Appendix G.

Mitigation

To mitigate impacts to the areas with archaeological potential, the following measures are proposed:

Parts of the Study Area that exhibit archaeological potential will require a Stage 2 assessment, by test pit and pedestrian survey, both at five metre intervals, where appropriate, prior to any impacts. Figures 12-18 in Appendix G show areas requiring Stage 2 assessments.

Part of the Tarbox Site is within the Study Area and retains CHVI. If impacted by the Airport Road project, the site will require a Stage 3 site-specific assessment, in order to more fully identify the character, extent and significance of the archaeological deposits, prior to any proposed development.

- The Stage 3 assessment should commence with the creation of a recording grid on a fixed datum, the position of which has been recorded using a Global Positioning System (GPS). A series of one-metre by one-metre units will then be excavated across

the entire site area at five metre intervals within an established grid to determine the nature and extent of the cultural deposits. An additional 20% of the total number of units excavated on the grid will be strategically excavated at five metre intervals throughout the site, around units of high artifact counts, or in other significant areas of the site. The test units should be excavated five centimetres into the sterile subsoil and soil fills screened through six millimetre wire mesh to facilitate artifact recovery. The sterile subsoil should be troweled, and all soil profiles examined for undisturbed cultural deposits.

- The results of the Stage 3 assessment will be used to evaluate the significance of the site and to develop a series of recommendations concerning any further mitigative options that may be necessary.

Part of the Yeoman Site is within the Study Area and retains CHVI. If impacted by the Airport Road project, the site will require Stage 4 mitigation, prior to any proposed development.

- As no midden area was identified, Stage 4 excavation of the Site should begin with the mechanical topsoil removal of fill on the east side of the site to expose natural topsoil. Additional one-metre units should be placed on the existing Stage 3 grid at five-metre intervals under the area of fill. If a midden is identified, it must be hand excavated. Once complete, mechanical topsoil removal can resume for the remainder of the property. The exposed subsoil surface should be cleaned by shovel or trowel to identify any subsurface cultural features. Two opposing quadrants at minimum should be hand excavated in larger cellar features and all exposed profiles will be recorded. Any architectural or structural remains should be documented with scale drawings and photographs. Where removal of architectural or structural remains is required by excavation, they should be mapped and drawn, and any intact cultural layers beneath should be hand excavated.

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

Confirmation of impacts to the two archeological sites is required in detailed design.

8.6.6 Cultural Heritage

The Cultural Heritage Resource Assessment determined that 63 cultural heritage resources are located within the Study Area. Of the 63 cultural heritage resources, 13 have the potential to be impacted by the recommended design. Impacted properties are listed below. Full details are included in Appendix H.

Potentially impacted properties:

1. 15388 Airport Road
2. 15420 Airport Road
3. 15421 Airport Road
4. 15426 Airport Road

5. 16000 Airport Road
6. 16075 Airport Road
7. 16078 Airport Road
8. 16114 Airport Road
9. 5 Walker Road West
10. 14799 Airport Road
11. 14892 Airport Road
12. 15049 Airport Road
13. 15717 Airport Road

Mitigation

To mitigate impacts to the cultural heritage resources, the following measures were proposed:

- Construction activities and staging should be suitably planned and undertaken to avoid impacts to identified cultural heritage resources. In particular, no-go zones should be established adjacent to all identified cultural heritage resources and instructions to construction crews should be issued in order to prevent impacts.
- A resource specific HIA should be conducted where the preferred solution is anticipated to impact any identified cultural heritage resource.
- Upon completion of the detailed design, the cultural heritage reports should be updated to ensure there are no changes or additional negative impacts to the identified cultural heritage resources.
- Should future work require an expansion of the Study Area then a qualified heritage consultant should be contacted.

A Heritage Impact Assessment (HIA) was completed for 16000 Airport Road to help inform the development of the design option which involved extending Old Church Road to connect with Ivan Avenue (see Appendix H-1). The intent of the HIA is to determine the cultural heritage value of the property using the criteria described in O. Reg. 9/06 and the Town of Caledon's Official Plan and to determine the impact of the proposed development on any parts of the property determined to possess cultural heritage value.

The evaluation of the property determined that the property has cultural heritage value. The building has direct associations with the Herbert and Burrell-Cannon families, some of the earliest families to settle in Caledon East. Also, members of the families were prominent figures within the community. As a commercial property situated within the settlement area of Caledon East, the property is physically, functionally, visually, and historically linked to its surroundings. Full details are included in Appendix H-1.

It should be noted that the Town of Caledon is undertaking further planning studies for 16000 Airport Road and incorporating the findings of the HIA.

- For the option of extending Old Church Road (not preferred), the HIA recommended the following to mitigate impacts to the cultural heritage resource at 16000 Airport Road:
- Since the subject property was found to retain cultural heritage value under O. Reg. 9/06, it should be considered eligible for designation. As such, the proposed extension of Old Church Road west of Airport Road to Ivan Avenue should be realigned to avoid impacts to identified heritage attributes, where technically feasible.
- Should it be determined that it is not technically feasible to realign the proposed extension to avoid the subject property, consideration should be given to relocating the structure to ensure the retention of physical heritage attributes.
- If relocation of the subject structure is under consideration, a structural engineer with experience in heritage architecture should be hired to determine if relocation is feasible. Additionally, a relocation and documentation plan should be prepared by a qualified heritage professional to document the resource prior to relocation.
- Should it be determined that it is not technically feasible to realign the proposed extension to avoid the subject property or to relocate the structure, the building should be documented as per “best practices” in the form of a Salvage and Documentation Report, including detailed photographs and measured drawings.
- Such a documentation report should be submitted to the Town of Caledon for its records and any local institution (such as the Peel Art Gallery, Museum and Archives) that may have interest.
- In addition, as part of the Heritage Impact Assessment report, a list of salvageable materials should be created and submitted to the Town of Caledon. The property owner and Town should cooperate to determine the potential appropriate reuse of any materials.
- Further mitigation including the completion of a 3D scan of the building and construction of a 3D model should be investigated.
- Consideration should be given to a heritage interpretive strategy including (but not limited to) a commemorative plaque with historical information and archival photographs of the structure. Heritage staff at the Town of Caledon should be consulted regarding this heritage interpretive strategy.

Confirmation of impacts to the 13 properties is required in detailed design.

8.6.7 Geotechnical Conditions

From a geotechnical perspective, it is recommended that the new culverts at C1 and C7 be supported on spread footings. This foundation scheme has a high probability of acceptable structural performance and requires relatively shallow excavations.

The new structure at Centreville Creek (C3) can likely be supported on Chance helical piles, a specialty product. Because of the specialized nature of this pile type, the final design and type will be the Contractor's responsibility. The existing borehole data is inadequate for deep foundation designs (Helical Piles). Therefore, further investigations are required within the footprint area of the new structure abutments to explore the depth of competent strata and to provide geotechnical recommendations for foundation designs.

Recommendations include:

- All excavations shall be carried out in accordance with the guidelines outlined in the Occupational Health and Safety Act and Regulations for Construction Projects.
- Granular material salvaged from under the existing pavement and shoulders is not recommended for re-use to construct the pavement base and subbase.
- All topsoil, organics, soft/loose and otherwise disturbed soils should be removed from the subgrade areas. The fine-grained soils will be weakened by construction traffic when wet. During wet weather conditions, an adequate granular working surface would be required in order to minimize subgrade disturbance. Subgrade preparation and fill construction should not be done in the winter.
- Immediately prior to placing the granular base course, the subgrade soils should be compacted and then proof rolled with a heavy rubber-tired vehicle.

Refer to Appendix J for more information on geotechnical recommendations and pavement design.

8.6.8 Contamination Overview

The Contamination Overview Study determined the scope of work for a Phase 2 Environmental Site Assessment, which is recommended to be completed during detailed design. The scope of work for the Phase 2 Environmental Site Assessment is detailed in Table 26.

Table 26: Recommended Scope for Phase 2 Environmental Site Assessment

Location	Design impact on property (amount of property required)	Scope	Analysis
15421 Airport Road (House Northeast of Mono Road community)	Full property taking may be required to accommodate hydro pole relocation and/or active transportation infrastructure.	4-6m Borehole with Monitoring Well, where property is required	M, PHC, VOC
15369 Airport Road (Empty property in Mono Road community North of Gas Station)	Property required due to widening intersection for turn lanes.		
15426 Airport Road (Northwest of Mono Road community)	Additional property required to accommodate for paved shoulder.	4-6m Borehole with Monitoring Well	M, PHC, VOC
15420 Airport Road (Northwest of Mono Road community)	Additional property required to accommodate for truck turning movement onto Olde Base Line Road as well as daylight triangle.		

8.6.9 Fluvial Geomorphology

The fluvial geomorphology assessment determined that the proposed spans at Crossings 1 and 3 (3.658m and 12.192m, respectively) are satisfactory from a fluvial geomorphological perspective. In each case, the span of the box culvert is more than three times the bankfull channel width and exceeds CVC's (2015) recommendation (while it is recognized that both crossings are located within TRCA's jurisdiction). Neither watercourse warrants a crossing structure that spans the meander belt due to the lack of notable channel erosion or migration observed near Airport Road as well as the conflicts with existing surrounding infrastructure that such a structure would present.

The watercourses at Crossings 1 and 3 should be restored to a condition that is better than existing and more natural. Given the wider culvert spans, the channel banks can be re-established across Airport

Road. This would not only help to partially restore channel form and function, but also improve habitat conditions for resident fish populations and encourage fish passage through the culverts. The recommended bed restoration strategy differs at these two crossings, as the maintenance of the marsh (and prevention of box culvert footing exposure) at Crossing 1 requires a bed with materials that will be stable over the range of expected flows, while the substrate at Crossing 3 can be more natural to facilitate sediment transport.

Mitigation

To mitigate impacts, the following measures are proposed:

- Both crossing structures should be designed to be as short as possible so as not to deter fish from entering.
- All work within areas regulated by the TRCA or CVC must be conducted during the appropriate in-water timing window to protect fish and fish habitat.
- The in-water work area should be isolated to prevent sediment from entering the watercourse.
- Any fish trapped within the isolated work area must be removed and transferred to a suitable downstream habitat by a technician with a License to Collect Fish for Scientific Purposes.
- Natural flow levels upstream and downstream of the isolated work area must be maintained.
- Intake ends of pump hoses used for bypass pumping around isolated works areas must have a screen in accordance with Fisheries and Oceans Canada requirement.
- Work within the isolated in-water work area should be conducted in the dry by pumping water into a water filtration system located at least 30m from the receiving watercourse or other waterbody.
- Minimize the area and duration of in-water works to the extent possible.

8.6.10 Groundwater

It is anticipated that groundwater control can be achieved by pumping from filtered sumps installed at the base of excavations. The discharge location should also be established prior to the start of dewatering. It is anticipated that groundwater discharge can be directed via overland flow to the various tributaries crossing the Site or to the municipal sewer system (sanitary or storm). Prior to discharge to the municipal sewer, a discharge permit agreement with the Region of Peel would be required and water quality compliance with applicable discharge By-Laws would need to be confirmed. For discharge to surface water bodies, water quality compliance with Provincial Water Quality Objectives would have to be confirmed. Treatment of discharged groundwater may be required to meet the discharge standards of the proposed discharge receiver.

Notwithstanding the above, a water quality sampling and sediment control plan will also be required for dewatering activities which would be the Contractor's responsibility. The dewatering system must also be appropriately filtered in order to prevent the pumping of fines and loss of ground during the dewatering activities.

Sediment control should include, but not be limited to, filtered sumps, filter socks and rock check dams/hay bales or temporary settlement ponds. Daily monitoring of dewatering discharge should be carried out to verify that the discharge is visually clear and free of suspended solids, sheens, or foam.

Detailed dewatering records should also be maintained by the Contractor with information on dewatering locations, duration and volume of pumping and timing for open cut excavations.

Dewatering is anticipated to be required for Culverts 1, 3, 7 and 9, where it is envisaged that open cut excavations will be required to install the new culverts:

- For preliminary design purposes, the estimated water taking volume from excavations required to install Culverts 1 and 3 simultaneously is approximately 156,500 L/day. The dewatering system should also be designed to accommodate a typical 2-year design storm event (32mm rainfall event), which will generate approximately 11,000 L/day, hence resulting in a total anticipated dewatering volume of approximately 167,500 L/day.
- Negligible seepage into excavations is anticipated at Culverts 4 and 5 since the groundwater level is estimated to be below the base of excavation.
- Construction dewatering activities will require a posting to the MECP Environmental Activity and Sector Registry (EASR). Posting to the EASR is required for construction dewatering activities where the dewatering volume is more than 50,000 L/day and less than 400,000 L/day.
- It is expected that construction dewatering activities will not require an application to MECP for a Permit to Take Water (PTTW). A PTTW is only required for dewatering volumes that exceed 400,000 L/day.
- The dewatering zone of influence is expected to range from about 5 to 10m around open excavations. Potential sources of contamination are not expected within zones of influence of dewatering activities.

8.6.11 Drainage and Stormwater

A stormwater assessment was undertaken to develop a stormwater management plan to convey external and internal runoff across Airport Road after the implementation of the recommended design. Results of the pavement area analysis revealed that the proposed improvements to Airport Road will

slightly increase the existing minor and major flows within five of the catchment areas (catchments C3A, C4A, C4B, C4C, and C5A). Minor and major flows within the remainder of the project corridor are decreased in the proposed condition.

As a result of hydraulic deficiency, C1, C3, C4, C7, C8, and C9 will be replaced and upsized in the proposed condition. C6 will also be replaced due to poor physical condition. Although hydraulically deficient, C2 cannot be upsized at this time due to road profile restrictions. As such, C2 will be maintained in the proposed condition, however, upsizing of this culvert should be considered in future road profile changes and rehabilitation work. C5 currently meets all hydraulic criteria and will also be maintained in the proposed condition. A comparison of existing and proposed culvert sizes is presented in Table 27**.**

Table 27: Comparison of Existing and Proposed Culvert Sizes

Culvert	Existing			Proposed		
	Size (mm)	Type	(m)	Size (mm)	Type	(m)
C1	900	CSP	22.35	3658 x 1067	Open Footing Concrete Box	24.10
C2	850	CSP	150.00	Culvert to Be Maintained		
C3	4350 x 870	Concrete Box	18.18	12192 x 1372	Open Footing Concrete Box	18.4
C4	450	CSP	24.05	825	Concrete Pipe	26.00
C5	2000 x 1100	Concrete Box	63.50	Culvert to Be Maintained		
C6	700	CSP	21.22	750	Concrete Pipe	25.85
C7	450	CSP	23.19	1830 x 900	Concrete Box	23.70
C8	600	CSP	21.24	750	Concrete Pipe	21.30
C9	600	CSP	23.66	825	Concrete Pipe	49.40

A 2019 IDF hydraulic assessment found that all proposed culverts meet the hydraulic criteria with the exception of C3 and C7. Both culverts do not meet the required freeboard and are constrained by the Airport Road roadway profile. As a result, these culverts cannot be upsized further to meet hydraulic criteria without significantly impacting the road profile. Although it is not possible at this time, upsizing of C3 and C7 should be considered in future road profile changes and rehabilitation work.

C2 fails to meet the freeboard criteria in the proposed condition and overtops the roadway for the design flow. Since C2 was hydraulically deficient in the existing condition and was unable to be upsized at this time due to road profile constraints, C2 continues to be deficient in the proposed condition. Upsizing of C2 should also be considered in future road profile changes and rehabilitation work.

C5 also fails to meet the freeboard requirement in the proposed condition. Although C5 is to be maintained, there is a road profile decrease at the location of the culvert in the proposed condition. As a result of this decrease, the freeboard at C5 drops below 1.0m in the proposed condition, however, it is still within an acceptable limit.

In the proposed condition, all proposed culverts will reduce the existing Regional storm water surface elevations.

Under proposed conditions at urban sections along Airport Road, runoff resulting from major storm events will continue to be conveyed to existing watercourse crossings as roadway overland flow, while runoff from minor storm events will be conveyed by the proposed condition storm sewer system (comprising a combination of existing sewers, replacement sewers, and new sewers).

At rural sections, both minor and major system flows will continue to be conveyed by roadside ditches towards receiving watercourses. The rural sections include the section from Olde Base Line Road to south of Cranston Drive. This section was assessed in the Stormwater Management Report as urban to capture the worst case impact scenario of all alternatives considered. The preferred design for this section reflects a rural versus urban cross-section.

General Mitigation

Mitigation measures related to water quality, water quantity and water balance are provided in the following sections.

Low Impact Development Measures

Four underground infiltration chambers are proposed along the Airport Road corridor as Low Impact Development (LID) measures to provide storage volume, reduce the quantity and rate of runoff leaving the proposed site, and provide water quality treatment through infiltration.

As another LID measure, vegetation is proposed within the centre island and four entry/exit pedestrian islands at the Boston Mills Road-Castlederg Sideroad/Airport Road roundabout, as well as within the centre island at the Cranston Drive/Airport Road roundabout. The vegetation within the roundabouts is proposed to reduce hard surfaces and promote water balance and peak flow reduction through infiltration.

The use of stormwater to irrigate new or replacement trees within the Airport Road Study corridor was considered. This can be achieved by turning road catchbasins into filterra side inlets. However, the location of trees within the right-of-way will be driven by side inlet locations. The unit requires a maximum of 2 maintenance visits in a year to remove debris, replace pre-treatment mulch, and prune the vegetation. This concept can be explored and reviewed in the context of source water protection policies during detailed design.

The potential for stormwater infiltration through pervious pavement and the use of underground storage for irrigation was also considered. This concept would work only when flooding recedes to normal water level in the creek. Based on the EA review, permeable paving/porous concrete was eliminated from the design. With the removal of permeable paving, infiltration chambers will be required at some locations to offset increased water quantities. Infiltration chambers cannot be utilised for irrigation as these are not storage tanks. Although the trees around infiltration chambers will receive extra moisture and require lesser irrigation.

Water Quantity Control

As a result of the increased flow rates in catchments C3A, C4A, C4B, C4C, and C5A, specific techniques to reduce the quantity and rate of runoff are required. Underground infiltration chambers are proposed within C3A upstream of OUTLET 1, within C4A upstream of OUTLET 2 (to provide combined storage for C4A and C4B), within C4C upstream of OUTLET 3, and within C5A upstream of OUTLET 6.

The four proposed infiltration chambers will provide 126m^3, 142m^3, 70m^3, and 42.24m^3 of storage volume, respectively, to address quantity control requirements within the corridor. Orifice plates will be proposed downstream of the infiltration chambers within control manholes to control the 100-year post-development peak flows to 100-year predevelopment levels.

Water Quality Control

Under proposed conditions, the existing roadside ditches will continue to provide water quality treatment for the rural corridor through vegetation runoff velocity reduction and infiltration as outlined by the MECP and stipulated in the Region of Peel Draft Stormwater Design Criteria and Procedural Manual (June 2019). For the urban corridor, water quality control will be addressed through a combination of Oil and Grit Separator (OGS) units, underground infiltration chambers, and Jellyfish Filters. When implemented in tandem, the OGS units, infiltration chambers, and/or Jellyfish Filters will form treatment trains and provide Enhanced Level water quality protection for runoff prior to discharge into receiving systems. In total, five OGS units, two Jellyfish Filters, and four underground infiltration chambers have been proposed within the Study Area.

Water Balance Control

Water balance calculations yielded a required infiltration volume of 6560.76m^3 for the proposed site. Based on the total vegetative area within the Project limits, the infiltration rate of the underlying soil, and a 24-hour detention time, the proposed Airport Road corridor will be capable of infiltrating 16,282.19m^3 of runoff which is equivalent to a rainfall depth of 67mm, substantially exceeding the Region of Peel requirements.

8.6.12 Culvert Replacement Mitigation

Mitigation measures will be required due to culvert replacements at crossing locations within the Study Area. The following mitigation measures are recommended to offset negative impacts of the project on the terrestrial and aquatic features in the vicinity of the crossings:

- Detailed staging drawings, to minimize temporary effects to the watercourse during construction, will be provided in the detailed design stage.
- Water management plans will be developed to facilitate completion of works “in the dry” through the use of by-pass pumping, dam and flume, partial coffer dams or timing of the works during dry conditions in the ephemeral channels.
- An in-water construction timing restriction must be implemented based on the recommendations provided by the TRCA and CVC. For coldwater systems (Crossings 1, 2, 3, 4, and 6), no in-water works are to be undertaken between October 1 and May 31. For warmwater systems (Crossings 5, 7, 8, and 9), no in-water works are to be undertaken between May 1 and July 15.
- A detailed restoration plan will be prepared for channel and bank areas associated with the culvert replacements. The restoration plans will include erosion and sediment control, vegetation strategies, and permanent stabilization measures.
- All culvert replacements will maintain or improve the current hydraulics of the crossings and will be designed to maintain the current watercourse gradient with appropriate embedding to promote fish passage.
- Incorporate habitat diversity into the final structure design (i.e., bank diversity and substrate placement associated with any scour protection requirements).
- All materials and equipment used shall be operated and stored in such a manner that prevents any deleterious substance from entering watercourses, wetlands, or other sensitive area.
- Work areas should be delineated with construction fencing to minimize the area of disturbance.
- Where cofferdams are to be employed, dewatering effluent should be treated prior to discharge to receiving watercourse. Dewatering must be discharged in a vegetated area 30m from the creek.
- Cofferdams should be constructed using pea gravel bags to isolate the work area and maintain flow.

- Fish isolated by construction activities should be captured and safely released to the watercourse. Fish capture and release are to be conducted by fisheries professionals.
- Apply standard sediment and erosion control measures (e.g., silt fence, flow checks, silt curtain, sedimentation basins) consistent with Ontario Provincial Standards and Specifications (OPSS) to ensure no effects to the surface waters. The control measures shall be implemented prior to construction of the work and be maintained during construction and until disturbed areas have been effectively stabilized with permanent vegetation cover.
- All disturbed areas of the work site shall be stabilized and re-vegetated promptly, and/or treated with appropriate erosion protection materials. In riparian and aquatic habitats, all temporarily disturbed areas will be reinstated to original condition upon completion of works.
- Any stockpiled materials shall be stored and stabilized away from the water.
- Crossings which are within the TRCA and CVC Regulated areas will require TRCA and CVC permits, respectively. Within the TRCA's jurisdiction, C1, C2, and C3 are Regulated watercourse crossings and within the CVC's jurisdiction, C5 is a Regulated watercourse crossing.

8.6.13 Utilities and Municipal Infrastructure

To implement the recommended design, relocation and/or protection of various utilities will be required. Utility companies will continue to be consulted as the design progresses.

Throughout the corridor, streetlights will be installed and/or relocated in accordance with the Region of Peel's standards. Streetlights will be located on new and/or relocated hydro poles, or standalone direct buried concrete poles at rural intersections. In urban areas, streetlights will be located on new and/or relocated base mounted poles. Streetlights will be located on aluminum poles where the clearance setback is not met. In areas where decorative poles are required, steel or aluminum poles will be used.

8.7 Detailed Design and Construction Schedule

The project and construction schedule is based on the assumption that the Class EA study will be completed in 2021. Design and construction of the proposed improvements will be undertaken in two phases. Phase 1 construction of Airport Road improvements from north of Cranston Drive to north of Huntsmill Drive, including Old Church Road from Airport Road to east of Marilyn Street, is currently scheduled in 2024. Phase 2 construction for the remainder of the Study corridor, from north of King Street to the proposed roundabout at Cranston Drive, is scheduled in 2026. The construction schedule is subject to the detailed design phase (including property requirements, utility coordination and contract administration) and Regional Council approval of the annual Capital programme.

8.8 Estimated Construction Cost

The estimated cost of construction is $56.3 million.

Table 28 provides the estimated cost breakdown. The estimate is based on the project and construction schedule outlined above. This estimate does not include costs for detailed design, property requirements and contract administration. A 20% contingency is included for each of the items below.

Table 28: Construction Cost Estimate

Description	Cost ($)
Road corridor and intersection improvements For Airport Road and Old Church Road corridors, including noise walls ($1,634,195) and utility infrastructure ($1,270,006.12)	$ 37,141,977.17
Traffic signals	$ 898.061.48
Streetlighting	$ 5,298,013.51
Streetscaping and landscaping	$ 1,393,086.18
Structural and culvert works	$ 2,559,196.27
Retaining walls, subject to assessment in detailed design	$ 161,107.92
Storm sewers and drainage works	$ 2,613,533.16
Sidewalk and multi-use path	$ 1,239,425.51
Staging	$ 5,006,497.57
Grand Total	**$ 56,310,898.77**

9. PERMITS, APPROVALS, MONITORING AND COMMITMENTS TO FUTURE WORK

Table 29 outlines the various permits and approvals that will be required as the project proceeds to detailed design and implementation. This section also outlines monitoring and commitments to future work to be completed during detailed design, construction and/or post-construction.

Table 29: Permits, Approvals, Monitoring and Commitments to Future Work

Matter	Phase	Permits, Approvals, Monitoring & Commitments
Accessibility	Detailed Design / Construction	Implement AODA according to legislated guidelines, which typically requires implementation at reconstruction or new construction. In this Study the following intersections have been identified as undergoing significant change where AODA should be implemented: • Improvement to the west leg of Old Church Road, subject to the Town of Caledon Urban Design Review Study • Controlled pedestrian crossing at Caledon East Public School Driveway and at Walker Road • Intersection widening at Airport Road and Olde Base Line Road
Agriculture	Detailed Design / Construction	Consider timing of road construction and detours to avoid the peak agricultural planning and harvesting season.
Archaeology	Detailed Design	Complete Stage 2 Archaeological Assessments, and Stage 3 and 4 Archaeological Assessments as recommended by Stage 2 and 3, in advance of any activities that have the potential to disturb archaeological resources. Indigenous communities (HWFN and MCFN) will be informed of Archaeological Assessment findings. The MCFN Field Representatives will be invited to be present during field investigations.
		Complete a Stage 3 Archaeological Assessment if the Tarbox Site is impacted. • The Stage 3 assessment should commence with the creation of a recording grid on a fixed datum, the position of which has been recorded using a GPS. A series of one-metre by one-metre units will then be excavated across the entire site area at five metre intervals within an established grid to determine the nature and extent of the cultural deposits. An additional 20% of the total number of units excavated on the grid will be strategically excavated at five metre intervals throughout the site, around units of high artifact counts, or in other significant areas of the site. The test units should be excavated five centimetres into the sterile subsoil and soil fills screened through six millimetre wire mesh to facilitate artifact recovery. The sterile subsoil should be troweled and all soil profiles examined for undisturbed cultural deposits.
		Complete a Stage 4 Archaeological Assessment if the Yeoman Site is impacted. • As no midden area was identified, Stage 4 excavation should begin with the mechanical topsoil removal of fill on the east side of the site to expose natural topsoil. Additional one-metre units should be placed on the existing Stage 3 grid at five-metre intervals under the area of fill. If a midden is identified, it must be hand excavated. Once complete, mechanical topsoil removal can resume for the remainder of the property. The exposed subsoil surface should be cleaned by shovel or trowel to identify any subsurface cultural features. Two opposing quadrants at minimum should be hand excavated in larger cellar features and all exposed profiles will be recorded. Any architectural or structural remains should be documented with scale drawings and photographs. Where removal of architectural or structural remains is required by excavation, they should be mapped and drawn, and any intact cultural layers beneath should be hand excavated.
		Conduct an additional Stage 1 Archaeological Assessment if the proposed work extends beyond the current Study Area.
Communication	Detailed Design	The section between Olde Base Line Road and Hilltop Drive was labelled as a transitional area for the purpose of evaluating alternative road designs that transition from rural to urban. This label can be reconsidered during detailed design so that it is not confused with other planning terms or designations.
Construction Permit	Prior to construction	Obtain a Permit to Take Water under the Ontario Water Resources Act for any water takings that exceed 50,000 L per day, unless exempt under O. Reg. 63/16. If groundwater and stormwater taking is between 50m^3 and 400 m^3/day, then the activity must be registered on the Environmental Activity and Sector Registry.
		Obtain permits and approvals for works in regulated areas from TRCA under O. Reg. 166/06.
		Obtain permits and approvals for works in regulated areas from CVC under O. Reg. 160/06.
Cultural Heritage	Detailed Design	The following mitigation measures will be forwarded to the Town of Caledon for consideration in the event that the heritage building at 16000 Airport Road is impacted by their Urban Design Review Study: • Determine feasibility of relocating the cultural heritage resource at 16000 Airport Road. A structural engineer with experience in heritage architecture should be hired to determine if relocation is feasible. • Additionally, a relocation and documentation plan should be prepared by a qualified heritage professional to document the resource prior to relocation.

Matter	Phase	Permits, Approvals, Monitoring & Commitments

		• If 16000 Airport Road cannot be relocated, the building should be documented in the form of a Salvage and Documentation Report, including detailed photographs and measured drawings.
		  • Such a documentation report should be submitted to the Town of Caledon for its records and any local institution (such as the Peel Art Gallery, Museum and Archives) that may have interest.
		  • In addition, as part of the Heritage Impact Assessment report a list of salvageable materials should be created and submitted to the Town of Caledon. The property owner and Town should cooperate to determine the potential appropriate reuse of any materials.
		  • Further mitigation including the completion of a 3D scan of the building and construction of a 3D model should be investigated.
		  • Consideration should be given to a heritage interpretive strategy including (but not limited to) a commemorative plaque with historical information and archival photographs of the structure. Heritage staff at the Town of Caledon should be consulted regarding this heritage interpretive strategy.

	Detailed Design	Conduct resource specific HIAs for any impacted cultural heritage resources.
	Detailed Design	Should future work require an expansion of the Study Area, then a qualified cultural heritage consultant should be contacted in order to confirm the impacts of the proposed work on potential cultural heritage resources.
	Detailed Design / Construction	Plan and undertake construction activities and staging to avoid impacts to identified cultural heritage resources. In particular, no-go zones should be established adjacent to all identified cultural heritage resources (BHRs 1-50 and CHLs 1-13) and instructions to construction crews should be issued in order to prevent impacts.
	Prior to Construction	Update the Cultural Heritage Resource Assessment report upon completion of detailed design to ensure that there are no changes or additional negative impacts to identified cultural heritage resources.
Design	Detailed Design	Coordinate design and implementation with improvements recommended in the Olde Base Line Road Feasibility Study.
		Property requirements will be refined through detailed design. A property acquisition strategy will be developed. Property will be acquired through negotiations and/or expropriation, as necessary.
		Coordinate active transportation and streetscape elements along Airport Road with the site organization and built form of adjacent development projects.
		Design streetscape and boulevard treatments in consultation with the Town of Caledon and adhere to the Town's urban design guidelines (Town of Caledon Comprehensive Town-Wide Design Guidelines, 2017). Review the Region's Streetscaping Toolbox Update (2017) for detailed streetscaping enhancements.
		Confirm utility conflicts and coordinate utility relocations within the Project limits.
		Grant MECP reviewer status for the detailed design phase of this project.
Drainage and Stormwater Management	Detailed Design	Develop detailed staging drawings to minimize temporary impacts to watercourses during construction.
		Develop water management plans to facilitate completion of works "in the dry" through the use of by-pass pumping, dam and flume, partial coffer dams or timing of the works during dry conditions in the ephemeral channels.
		Prepare a detailed restoration plan for channel and bank areas associated with the culvert replacements. The restoration plans will include erosion and sediment control, vegetation strategies, and permanent stabilization measures.
		Explore the feasibility of using stormwater to irrigate new or replacement trees (e.g., by turning road catchbasins into filterra side inlets). Review this concept in the context of source water protection policies.
		Review final design of Stormwater Management and Low Impact Development with the Ministry of the Environment, Conservation, and Parks.
	Prior to Construction	Develop an Erosion and Sediment Control Plan. Best management practices should be implemented during construction.
		Obtain an Environmental Compliance Approval under the Ontario Water Resources Act for municipal stormwater management works.
	Prior to / During Construction	Adhere to construction timing restrictions provided by the TRCA and CVC. For coldwater systems (Crossings 1, 2, 3, 4, and 6), no in-water works are to be undertaken between October 1 and May 31. For warmwater systems (Crossings 5, 7, 8, and 9), no in-water works are to be undertaken between May 1 and July 15.
		Incorporate habitat diversity into the final structure design (i.e., bank diversity and substrate placement associated with any scour protection requirements).

Matter	Phase	Permits, Approvals, Monitoring & Commitments
		Store all materials and equipment in a manner that prevents any deleterious substance from entering watercourses, wetlands or other sensitive area.
		Delineate work areas with construction fencing to minimize the area of disturbance.
		Treat dewatering effluent, where cofferdams are to be employed, prior to it being discharged to a receiving watercourse. Dewatering must be discharged in a vegetated area 30m from the creek.
		Construct cofferdams using pea gravel bags to isolate the work area and maintain flow.
		Capture and release any fish that become isolated by construction activities. This is to be conducted by fisheries professionals.
		Stabilize and re-vegetate all disturbed areas, or treat with appropriate erosion protection materials. In riparian and aquatic habitats, all temporarily disturbed areas will be reinstated to original condition upon completion of work.
		Store and stabilize all stockpiled materials away from the water.
		Construct inceptor ditches and/or surface drains prior to commencement of any related cut or fill activities.
		Handle discharge in a manner that prevents sediment from entering watercourses, scouring and erosion at the outlet, where dewatering is required and where culverts are cleaned by hydraulic means.
		Develop an erosion and sediment control plan that adheres to Erosion and Sediment Control Guidelines for Urban Construction, December 2006, Greater Golden Horseshoe Area Conservation Authorities.
		Include erosion and sediment control measures in the contract drawings and documents.
Fluvial Geomorphology	Detailed Design	Include low-flow channels to maintain or enhance flow characteristics, sediment conveyance and fish passage through the new culverts recommended at Crossing 1 and 3.
		Align upstream and downstream ends of the culverts with the channel to avoid unanticipated erosion hazards.
		Develop proposed crossing structure designs to minimize the degree and duration of in-water works.
		Avoid barriers to fish passage by implementing open-bottom culverts or embedding replacement crossing structure at a minimum of 0.3m.
	Construction	Use natural substrate to improve aquatic habitat conditions when reconstructing the bed.
		Conduct in-water works at Crossings 1, 2, 3 and 7 in the dry during the appropriate in-water timing window.
Illumination	Detailed Design	Check streetlighting levels against applicable standards.
Natural Heritage	Detailed Design	Undertake a self-assessment to determine if a DFO screening is required (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html).
		Complete wildlife survey investigations where any data gaps exist.
		Re-examine the presence of species at risk and continue consulting with MECP to confirm any general habitat protection measures that may be required.
		Complete additional screening as required based on future changes to species' listings or habitat regulations of the ESA.
		Develop an Erosion and Sedimentation Control Plan to minimize construction-related impacts on water quality and fish habitats. The plan should cover the installation, maintenance, and removal of the temporary erosion and sediment control measures, and the removal of sediment accumulated by the control measures.
		Avoid the active roosting season for endangered bat species by removing trees only between October 1 and May 1.
		Limit tree removals to the extent possible.
		Contact MECP to determine if a permit under the ESA is needed if a stand of trees is identified to be removed by the project.
		Complete exit surveys to confirm presence or absence of SAR bats if any suitable anthropogenic roosting structures (i.e., old houses, barns, etc.) are proposed for removal.
		Complete a formal health assessment of the identified Butternut to determine if measures are required to protect this individual to ensure compliance with the ESA (2007).

Matter	Phase	Permits, Approvals, Monitoring & Commitments
		Avoid impacting Provincially and Locally Significant Wetlands during detailed design, to the extent possible.
		Develop a tree removal, restoration and compensation plan.
		Develop a landscape plan for tree replacements and potential roundabout treatments within the Project limits. The landscaping plan should contain native species suitable to site conditions.
		Develop Tree Preservation Plan and complete a follow-up survey where any data gaps exist.
		Update the recommendations for tree preservation, removal and mitigation measures included in the Natural Environment Impact Assessment Report, as required.
		Develop an Invasive Species Management Plan.
		Develop a grading plan that ensures that alteration to field margins will not result in substantial draining of surface water from these communities.
		Review any proposed direct wetland loss with the TRCA and review compensation measures to result in no net wetland loss as part of the permitting process.
		Enhance existing wetland buffers where possible.
		Consider wildlife crossing signage at each of the locations identified by the TRCA.
		Minimize riverbank and riverbed hardening to the extent possible by designing any replacement structures to maintain the existing natural substrates and gradients with an invert that allows continued fish passage.
		Consider open bottomed structures where culvert replacements are required.
		Design stormwater management to maintain water balance to all identified watercourses that provide fish habitat to ensure that existing levels of channel instability at sensitive sites downstream are not increased. This is consistent with the management objectives of the Centreville Creek Subwatershed Study (TRCA 2003).
		Consider replacement of functions at the headwater drainage features at Crossing 5 and Crossing 6.
		Consider the inclusion of Milkweed in planting plans for areas that are disturbed by construction.

		Improve the likelihood of drainage culverts functioning as movement corridors by considering the following recommendations in detailed design where culvert replacements are proposed, and the general structure size permits the recommendations:
		• The culvert should be backfilled to create a low flow channel with dry “benches” along the edges. Backfill material should include:
		  ○ a layer of native soil
		  ○ overlaid with coarse gravel (0.01-0.03m)
		  ○ overlaid with a 50-50 mix of coarse gravel (0.01-0.03m) and cobble (0.1-0.3m) with interstitial spaces filled with native soil on only the edges of the culvert to create two (2) dry “benches” each approximately one third (1/3) of the width of the culvert.
		• Backfilling should leave a low flow channel approximately one third (1/3) of the width of the culvert. This channel should meander along the length of the culvert.
		• Backfilling and imbedding of the culvert should maintain a minimum of 1m of clearance between substrates and the top of the culvert.
		• Boulders (300-500mm) should be placed throughout the length of the culvert on the dry “benches” at a density of 1-2 boulders per 2m of culvert length.
		• CVC recommends that in order to increase the likelihood of use of a culvert by wildlife, the openness ratio ([height x width] / length) should be no less than 0.1 (ideal is 0.4 or greater).

		Improve the likelihood of drainage culverts functioning as movement corridors by considering the following recommendations related to culvert ends in detailed design: • Culvert ends can be constructed using either a retaining wall or wing walls; however, wing walls are preferred as they act to funnel wildlife into the culvert. • Materials used for culvert end treatments should be relatively smooth to discourage climbing by wildlife (e.g., precast concrete).

Matter	Phase	Permits, Approvals, Monitoring & Commitments
		Improve the likelihood of drainage culverts functioning as movement corridors by considering the following recommendations related to fencing design at culverts in detailed design: • Fencing should be tied into the end of culvert treatment. • Fencing should extend across the roadside ditch, away from the culvert to the edge of the road right-of-way. Keeping the fencing as far from the road as possible will minimize damage from snow removal activities. • Where the fence crosses the ditch, the gap below the fence should be filled with rip-rap to permit water flow but exclude wildlife. • CVC recommends that fencing be constructed of galvanized steel chain-link fencing that is 1-2m in height. • To exclude smaller animals (mice, voles, frogs, etc.), panels of galvanized hardware cloth or similar material with a mesh size of 6mm (0.25 inches) be added to the lower 1m portion of chain-link fencing. • The bottom of the fencing should be buried between 0.2-0.4m underground to deter wildlife from digging under the fence.
		Consider potentially increasing the diameter of the culvert at Crossing 7 during detailed design.
		Tree replacement ratios per CVC's requirements on applicable land. Wetland offsetting for any affected wetlands as appropriate.
	Prior to Construction	Obtain a Fish Collect Permit for the capturing and safely releasing of fish isolated by construction activities (if applicable) at the applicable watercourses.
		Isolate the edge of the Treed Sand Barren Community using standard Erosion and Sediment Control practices.
		Avoid any site alterations or disturbance within the Treed Sand Barren Community.
	Construction	Undertake all in-water and near-water works during the appropriate fisheries timing windows: • Crossings 1, 2, 3, 4, and 7 are identified as coldwater systems and as such in-water works must be undertaken between June 15 and September 15 at these crossings. • Crossings 5 and 6 were identified as warmwater systems and as such in-water works must be undertaken between July 15 and April 30 at these crossings.
		Maintain vegetation within 30m of watercourses to minimize channel bank erosion and maintain water quality.
		Undertake in-water works "in the dry" with flows being maintained to downstream reaches of the watercourses.
		Screen water intakes to inhibit fish from becoming entrained or impinged by pumping activities. The screen must be oriented in the same direction as flow.
		Collect and move any fish trapped within the work area to a suitable habitat downstream. This work must be completed by a qualified biologist under a MNRF issued "License to Collect Fish for Scientific Purposes".
		Notify DFO immediately if a situation occurs or if there is imminent danger of an occurrence that could cause serious harm to fish. If there is an occurrence, corrective measures must be implemented.
		Prohibit plantings and installations of additional vegetation within the Treed Sand Barren Community during the final site stabilization.
		Install tree protection fencing along the edge of disturbance to protect trees and natural vegetation communities.
		Stabilize and revegetate any disturbed and/or exposed soil via a native seed mixture suitable to site conditions. The seed mix should be consistent with CVC/TRCA Plant Selection Guidelines.
		Prepare the areas to be seeded by eliminating uneven areas and low spots, removing weeds to the extent achievable, and removing branches and stones in excess of 50mm.
		Lay a jute mat, Bonded Fibre Matrix or equivalent on top of the seed mix to further stabilize disturbed soils in areas of slopes greater than 3:1. Where slopes are less than 3:1, seeding and mulch should be used to stabilize disturbed soils.
		Complete all necessary vegetation removal (e.g., tree/shrub clearing, etc.) outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). If limited vegetation removal must occur early during this period (i.e., between April 1-April 15), a nest survey should be conducted by a qualified biologist within 5 days of commencement of vegetation removal activities to identify and locate active nests of bird species (where present) covered by the federal Migratory Bird Convention Act, 1994 or provincial Fish and Wildlife Conservation Act, 1997. If a nest is located or evidence of breeding noted, a mitigation plan should be developed to avoid any potential impacts on birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.
		Maintain a 30m buffer from wetland communities within the project area.

Matter	Phase	Permits, Approvals, Monitoring & Commitments
		Allow vegetation within the 30m buffer to remain in a natural state.
		Maintain water balance within wetlands to ensure suitable water levels for turtle hibernation are present and ensure consistency with the Centreville Creek Subwatershed Study (TRCA, 2003).
		Undertake wetland removals, if required, in late summer during periods of low water levels to minimize potential impacts.
		Obtain a Fish Collect Permit for the capturing and safely releasing of fish isolated by construction activities (if applicable) at the applicable watercourses.
		Contact MECP staff if Barn Swallows are found to be nesting in culverts. Work should halt until advice from MECP is obtained on how to proceed.
		Undertake site alteration outside of the April 1 to August 31 window, as this time corresponds to peak nesting / breeding period for avian species.
		Employ appropriate Erosion and Sediment Control measures to prevent the erosion of unstable sols and the movement of sediment and/or other deleterious substances into any Provincially Significant Wetlands. These measures shall be in place prior to the onset of site preparation.
		Implement Erosion and Sedimentation Control Plan to minimize construction-related impacts on water quality and fish habitats.
		Implement best management/construction practices and control of all construction operations to reduce the potential for spills or other materials/equipment from entering the watercourses/pond within the Study Area.
		Ensure appropriate provisions are taken by the Contractor as to not block or prohibit wildlife access to culverts and to the wildlife corridor.
		Pause development and site alteration within field communities found to contain standing water in the spring until water levels have receded.
		Complete in-water works inside the appropriate timing windows.
		Establish tree protection zones and install protective materials prior to construction to prevent damage including, but not limited to, root destruction and soil compaction.
		Clear vegetation outside of the bird timing window. An ecologist will confirm that nests are no longer active, if encountered during clearing.
		Ensure appropriate provisions are taken by the Contractor as to not block or prohibit wildlife access to culverts and to the wildlife corridor.
Noise	Detailed Design	Confirm location and type of noise walls during detailed design. Construct noise walls at locations verified during detailed design.
	Construction	Adhere to the Town of Caledon noise by-law requirements.
		Adhere to MECP's NPC-105 for construction equipment.
Retaining Walls	Detailed Design	Complete a detailed condition assessment of the retaining walls along Airport Road from Huntsmill Drive to the Caledon Trailway, and coordinate any improvements required with the construction on Airport Road.
		Complete a cost-benefit analysis for the retaining wall at the northwest corner of Airport Road and Old Church Road to confirm the preferred replacement method. The replacement may be coordinated with future work on the west leg of the Old Church Road intersection, subject to the Town of Caledon's urban design review study.
Servicing	Prior to Construction	Obtain Environmental Compliance Approvals (ECAs) from MECP for new/relocated sewers and stormwater management outfalls, sewer use for discharge of dewatering effluent (compliant with Section 53 of the Ontario Water Resources Act and relevant MECP guidelines), as appropriate. Should potable water lines be relocated, ECA will be sought from MECP prior to relocation.
Traffic	Detailed Design	Prepare a detailed traffic management plan that provides work zones, roadway lane closure extents, and times.
		Confirm type of controlled crossing (PXO or IPS) in consultation with the Town of Caledon at the Caledon East Public School Exit and Walker Road.
		Coordinate crossing improvements with proposed development plans for the north access to 15717 Airport Road.
		Monitor pedestrian, cyclist and vehicular activity at the Walker Road intersection.
		Review and incorporate, as feasible, detailed traffic calming measures between Boston Mills Road and Cranston Drive (specifically before and after the community of Mono Road) and confirm the type and location of the traffic calming measures in consultation with the Town of Caledon. Examples of detailed measures include pavement markings, flashing "slow" signs or radar speed signs, and visual cues.

Matter	Phase	Permits, Approvals, Monitoring & Commitments
		Complete additional analysis to determine if there is an opportunity for a phased-in approach to construct the roundabout at Cranston Drive (e.g., one lane initially with provision to add a second lane in the future if or when required). Review results or opportunity for phased-in approach with the Town of Caledon.
		Extend the proposed multi-use path and urbanization to the south limit of the Caledon East Settlement boundary to coordinate with approved residential development on the east side.
		Confirm the design of all transition points between multi-use paths and signed bike routes, such as the conversion at Airport Road and Mountcrest Road, in consultation with the Town of Caledon.
		Confirm whether lane widths can be reduced to 3.35m in the road section from Hilltop Drive to south of Cranston Drive, in consultation with the Town of Caledon.
		Confirm sightlines at Parsons Avenue in the context of layby parking design and in the absence of an alternate signalized egress to Airport Road.
		Work with the Town of Caledon through their Urban Design Review Study to review possible future private access options for the west leg of the Old Church Road intersection.
		Complete a speed limit review north of Huntsmill Drive to Patterson Side Road while considering the proposed improvements at Huntsmill Drive and public suggestions for advanced warning signs north of Huntsmill Drive and flashing lights at Huntsmill Drive.
		Continue advocating the Province for regular mobile truck inspection units on Airport Road through Caledon East.
		Coordinate improvements to Airport Road and Olde Base Line Road with potential future improvements to upgrade Olde Base Line Road from Airport Road to Highway 10 (Hurontario Street), including improvements to the shoulder for cycling.
		Implement enhanced driver education for roundabouts, including the two-lane flared entry design at Cranston Drive.
Winter Operations and Maintenance	Detailed Design / Prior to Construction	Discuss and confirm winter maintenance of active transportation facilities along Airport Road and Old Church Road.
Geotechnical	Detailed Design	Further geotechnical investigations are required within the footprint of the new structure at the Caledon Trailway crossing to explore the depth of competent strata capable of providing sufficient design information for feasible deep foundations design.
Hydrogeological	Detailed Design	Confirm that groundwater meets quality criteria for discharge into the municipal sewer (Region of Peel Sewer Use By-Laws) or to surface water (Provincial Water Quality Objectives).
		The design of a dewatering system and associated sediment control plan is the responsibility of the Contractor. Dewatering can be achieved by pumping from strategically placed filtered sumps within the base of excavations.
		Where necessary, carry out additional field investigations to further refine the hydrogeological recommendations based on the detailed design concepts. A more rigorous assessment of dewatering requirements and zone of influence calculations is recommended.
		Additional groundwater instrumentation is recommended in the vicinity of an artesian pond at 16399 Airport Road to investigate local groundwater and surface water conditions and to evaluate the potential for impacts from construction.
		Investigate the hydraulic characteristics of the meltwater channel that runs from Boyce's Creek to south of the Caledon East urban area, as the potential exists for high dewatering volumes in areas north of Walker Road (e.g., at Culvert No. 1) in the vicinity of this channel.

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APPENDIX A: CONSULTATION PLAN

APPENDIX A - 1: PUBLIC CONSULTATION

APPENDIX A - 2: INDIGENOUS COMMUNITIES CONSULTATION

APPENDIX A - 3: AGENCY CONSULTATION

APPENDIX B: TRANSPORTATION STUDIES

APPENDIX B - 1: TRANSPORTATION STUDY REPORT

(INCLUDING DETAILS ON DEVELOPMENTS, ARCADY RESULTS AND ROUNDABOUT SCREENING)

APPENDIX B - 2: OLD CHURCH ROAD EXTENSION TRAFFIC UPDATE

APPENDIX B - 3: ROUNDABOUT TRAFFIC & SAFETY ASSESSMENT AND FUNCTIONAL DESIGN REVIEW

APPENDIX B - 4: PARKING ANALYSIS

APPENDIX B - 5: MULTI-MODAL LEVEL OF SERVICE PILOT

APPENDIX C: NATURAL ENVIRONMENT REPORT

(INCLUDING EXISTING CONDITIONS AND IMPACT ASSESSMENT)

APPENDIX D: TREE INVENTORY AND PRESERVATION PLAN

APPENDIX E: AIR QUALITY ASSESSMENT REPORT

APPENDIX F: ROAD TRAFFIC NOISE ASSESSMENT REPORT

APPENDIX G: STAGE 1 ARCHAEOLOGICAL ASSESSMENT REPORT

APPENDIX H: CULTURAL HERITAGE RESOURCE ASSESSMENT REPORT

APPENDIX H - 1: HERITAGE IMPACT ASSESSMENT REPORT

APPENDIX I: CONTAMINATION OVERVIEW STUDY REPORT

APPENDIX J: GEOTECHNICAL AND PAVEMENT DESIGN REPORT

APPENDIX K: FLUVIAL GEOMORPHOLOGICAL ASSESSMENT REPORT

APPENDIX L: HYDROGEOLOGICAL REPORT

APPENDIX M: STRUCTURAL ASSESSMENT AND INSPECTION REPORT

(INCLUDING GENERAL ARRANGEMENT AND STAGING DRAWINGS)

APPENDIX N: STORMWATER MANAGEMENT REPORT

APPENDIX O: DETAILED EVALUATION TABLES

APPENDIX P: PRELIMINARY DESIGN