Regional Municipality of Peel

Environmental Study Report

For

Winston Churchill Boulevard Class Environmental Assessment Study

H-136921
Rev. 0
April 21, 2023

Municipal Class Environmental Assessment
Environmental Study Report

Winston Churchill Boulevard
Region of Peel from Highway 401 to Embleton Road

Prepared for:
The Regional Municipality of Peel
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2023-04-24	0	Public Review	Carling MacDonald	John Hemingway	Melissa Alexander
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**
HATCH					

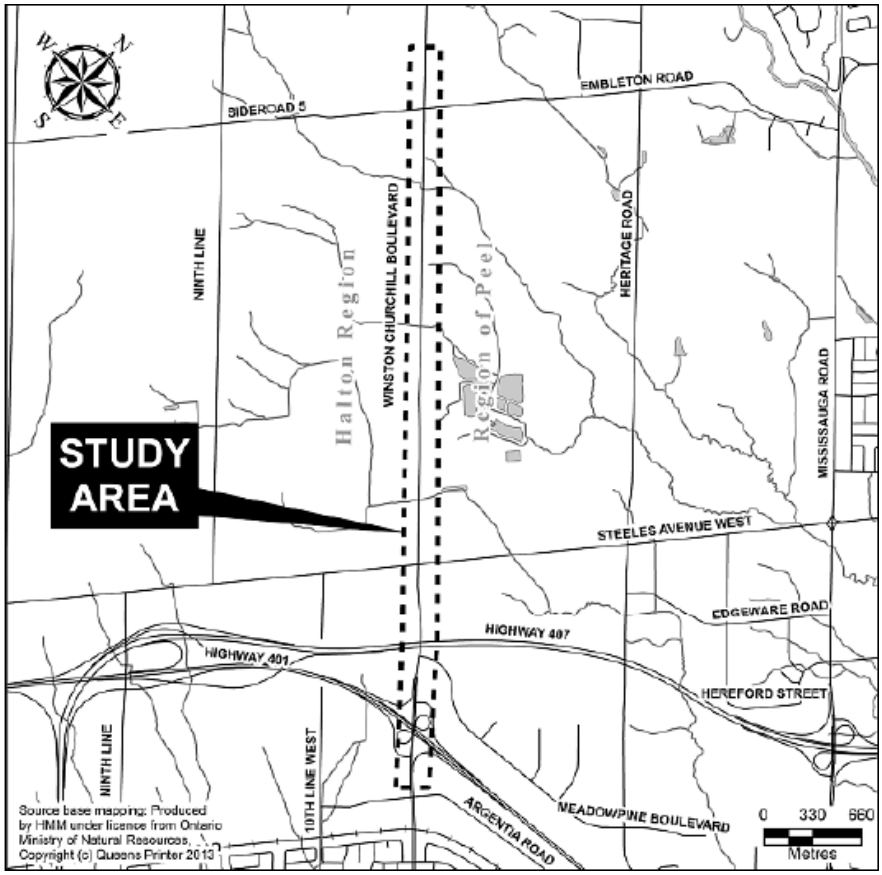
Executive Summary

This study was completed under the requirements of a Schedule "C" Class Environmental Assessment (EA) per the Ontario Municipal Engineers Association (MEA) *Municipal Class Environmental Assessment (Class EA)* document (October 2000, as amended in 2007, 2011 and 2015). Schedule C Municipal Class EAs are reserved for those projects which have the potential for significant environmental effects and include new facilities and major expansions to existing facilities. Schedule C projects must follow the full planning and consultation process outlined in the Class EA process, including the preparation of an Environmental Study Report (ESR).

Background to the Study

The Regional Municipality of Peel (Region of Peel) initiated a Schedule C Municipal Class EA ("Study") to examine the need and justification for improvements to a 4.2 km section of Winston Churchill Boulevard from Highway 401 to Embleton Road (the "Study Area" shown in **Figure ES-1** below). Winston Churchill Boulevard is a Regional Boundary Road, bordering the Region of Peel and the Halton Region, as well as being a north-south arterial road forming the boundary between the City of Brampton, City of Mississauga and the Town of Halton Hills.

Figure ES-1: Study Area



Hatch (formerly Hatch Mott MacDonald (HMM)) was retained by the Region of Peel to undertake the Study to assess the need for road improvements to accommodate existing and future traffic demands, and ultimately provide a preferred design. The Study is being led by the Region of Peel in accordance with the Peel/Halton Boundary Road Agreement. While the Region of Peel will be responsible for leading the efforts, the Project is considered a shared project, and in accordance with the Terms of the Agreement, the Region of Peel is obligated to involve Halton Region in each step of the EA process.

The purpose of the proposed roadway improvement is to address planned future growth, operational and servicing deficiencies, and road link capacity limitations. The Study also reviewed opportunities to accommodate and encourage alternative modes of transportation, including walking, cycling, and public transit along both sides of the corridor.

Existing and Future Conditions

As a part of the Study, a review of existing and future conditions was completed. The objective of these studies was to confirm the need and justification for improvement and expansion of the roadway and identify potential environmental constraints related to the proposed alternative solutions. The following components were covered in the review of the existing and future conditions:

- Air quality
- Archaeology
- Soil contamination
- Cultural heritage
- Foundations
- Geomorphology
- Geotechnical
- Hydrogeology
- Natural heritage
- Noise
- Structural
- Stormwater management
- Transportation and safety

The technical reports for each of these topics can be found in the attached appendices.

Problem/Opportunity Statement

Winston Churchill Boulevard currently operates at an acceptable level of service, safety and traffic operations. However, the forecasted growth for the Region of Peel suggests that Winston Churchill Boulevard will experience increasing congestion, safety and operational issues if no improvements are implemented by 2031. Active transportation and transit facilities in the corridor will also require additional improvement to provide greater opportunities for multimodal travel. Based on the review of the existing and future conditions, as well as through consultation with the public, stakeholders and Indigenous communities, it has been determined that improvements are needed on Winston Churchill Boulevard corridor to address:

- Existing and future traffic demands;
- Safety and operational issues;
- Aesthetics and streetscaping along the corridor; and

- Active transportation and transit facility improvement.

Development and Evaluation of Alternative Planning Solutions

The following alternative solutions were considered for addressing existing and future travel demand, aesthetics and streetscaping and multimodal travel on Winston Churchill Boulevard within the Study Area:

Alternative Solution #1: **Do Nothing** – Maintain the existing configuration of Winston Churchill Boulevard with no improvements other than regular maintenance. This alternative is used as a baseline comparison for other alternatives.

Alternative Solution #2: **Transportation Demand Management/System Management –** To encourage and support alternative transportation behaviours to reduce peak travel demand.

Alternative Solution #3: **Widen/Improve** Winston Churchill Boulevard – Widen and improve Winston Churchill Boulevard from Highway 401 to Embleton Road to increase capacity and reduce congestion along this corridor.

Alternative Solution #4: **Widen Other Roads** or Construct New Roads – Improve adjacent parallel roads to accommodate the projected future traffic conditions along Winston Churchill Boulevard.

These alternative planning solutions were evaluated based on their impact to the socio-economic and cultural environment, natural heritage, land use, engineering, and from the capital costs associated with each solution. These components were reviewed by the public, stakeholders, regulatory agencies, and Indigenous communities and groups to evaluate the above alternative solutions against each criterion to determine a preferred solution.

Preferred Solution

Alternative Solution #3 (to widen/improve Winston Churchill Boulevard) was identified as the preferred solution, as it adequately addresses the transportation needs along the corridor and improves the socio-economic environment. This Alternative has potential to impact the natural and cultural environment, however, after applying the appropriate mitigation measures, this solution was weighed against the other options and determined to address the need and justification for the project.

Evaluation of Alternative Design Concepts

The following Alternative Design Concepts for the preferred solution were considered in this Study for each section of the roadway:

- Do nothing (i.e., maintain current conditions or the “status-quo”);
- Widen along the centreline;
- Widen to the East; or
- Widen to the West.

The roadway was segmented for analysis into three sections based on traffic and physical differences. The sections included: Highway 401 to Steeles Avenue; Steeles Avenue to 2km south of Embleton Road (Maple Lodge Farms); and Maple Lodge Farms to Embleton Road. An evaluation was completed based on transportation, engineering, socio-cultural, natural environment and cost criteria.

Description of the Preferred Design Concept

The preliminary preferred design concepts were presented to the public as follows:

- Highway 401 to Steeles Avenue: Widen to the East
- Steeles Avenue to Maple Lodge Farms: Widen along the Centre
- Maple Lodge Farms to Embleton Road: Widen along the Centre

Based on further refinement of this preferred design concept and feedback received from the public, the details related to the preferred design concept are presented below:

- Winston Churchill Boulevard is to be widened to six lanes (three 3.5-metre wide driving lanes in both directions) between Highway 401 and Embleton Road.
- A continuous central flush median is proposed to provide two-way left-turn lanes to allow access to the existing residential and commercial properties located along both sides of the roadway. In areas with safety concerns, sections of raised median are proposed.
- A 3-metre wide Multi-Use Path (MUP) on both sides between Steeles Avenue and Embleton Road. There will be a sidewalk on the west side and a MUP on the east side between Highway 401 and Steeles Avenue.
- A 2.5-metre green space buffer is recommended between the travelled portion of the roadway and the MUP where feasible.
- Stormwater management to be constructed at each section of the roadway, including underground storage chambers and oil/grit separators. The green space buffer will provide enough space to accommodate the stormwater management plan.
- In the segment between Steeles Avenue and 2 km south of Embleton Road, the preferred design concept includes a cross section with reduced features with an approximate 40-metre right-of-way to reduce impact to existing properties.
- For all pavement widening, the new pavement thickness should match or exceed the thickness of the existing pavement so that positive subsurface drainage is maintained across the widened area. The substrate is intended to match the existing conditions of the roadway.

Summary of Consultation Activities

Phase 1 Consultation

During Phase 1 of consultation, a Notice of Commencement was published in local newspapers on November 17 and November 27, 2014, and sent to property owners, stakeholders, review agencies, and

Indigenous communities via mail. The Notice detailed the Study Area, summarized the objectives of the Study, and requested feedback/comments to those interested.

A Technical Advisory Committee (TAC) meeting (TAC #1) was held on August 27, 2015, to present preliminary information on the Study, including the need and justification for improvements and an assessment of the planning alternatives. The meeting provided an avenue for feedback on the baseline studies, alternative solutions and provided an opportunity for agencies to make comments on the Study.

Phase 2 Consultation

During Phase 2, consultation included a Notice of Public Information Centre (PIC) #1 (PIC #1) which was published in local newspapers and mailed to appropriate contacts on October 8 and October 15, 2015, for the PIC being held on October 22, 2015.

Following PIC #1, a meeting was held between the 407 ETR Project Team and the Ministry of Transportation Ontario (MTO) on September 15, 2016 to address concerns prior to the second TAC meeting (TAC #2) held on October 4, 2016.

Phase 3 Consultation

In Phase 3, during preparation for the second PIC (PIC #2), a concern was raised regarding the potential for the project to encroach upon Mount Zion Cemetery within the Study Area. Multiple meetings were held between 2016 and 2017 with the Region of Peel, Halton Region and City of Brampton to discuss the issue and develop appropriate mitigation measures and to initiate the required archaeological assessments.

The third (and final) TAC meeting (TAC #3) was held on October 28, 2021. One of the main issues raised during TAC #3 was related to access to residential properties along the roadway. Further discussion with the Region of Peel and Halton Region was required to come to an agreement prior to PIC #2. Furthermore, additional risk analysis may be required during detailed design to mitigate potential impacts on affected property owners related to access.

Following the completion of the Stage 2 Archaeological Assessment, and adjustments to the preliminary preferred design concept to address concerns regarding access to residential and commercial properties, the team decided to proceed with PIC #2, and the Notice was published in local newspapers on May 5 and May 12, 2022, for the virtual PIC #2. The material was made available online at: https://www.peelregion.ca/pw/transportation/construction/environmental-assessment/winston-churchill-boulevard.asp . The PIC #2 presentation was publicly available online for comment between May 19 and June 19, 2022. PIC #2 summarized the topics covered in PIC #1, the studies that had occurred since, a revisit of the existing conditions, the evaluation of alternative design concepts, and introduced the preferred design concepts for each section of the roadway. A number of meetings were held with the CVC to ensure that they were in agreement with the natural heritage and stormwater management and drainage reports. Meetings were held to discuss comments and agreed upon responses.

The Draft ESR report was distributed to government agencies, stakeholders and Indigenous communities and organizations on November 4, 2022. The formal review period for agencies and stakeholder remained open until November 25, 2022, and for Indigenous communities it remained open until

December 9, 2022. Late comments received up until December 20, 2022, were also considered and incorporated into the final ESR. An additional extension for review of the Draft ESR was granted to Haudenosaunee Confederacy upon request, and funding was provided by the Regional of Peel to assist with their review of the report.

Potential Environmental Effects and Mitigation Measures

The Study has identified potential environmental impacts associated with the project, as well as proposed mitigation measures to avoid or minimize the risks associated with these impacts. In addition to the proposed mitigation measures outlined in this report, the Region of Peel has already committed to certain undertakings to implement during detailed design and/or construction to further inform mitigation measures and/or avoid environmental impacts where possible. Environmental features that were examined during this stage of the Study include:

Natural Environment:	• Terrestrial environment • Wildlife • Species at risk • Watercourses and wetlands • Woodlots • Air quality
Socio-economic Environment:	• Archaeology, built heritage and cultural heritage • Residential and commercial properties • Aesthetic / visual components
Transportation:	• Active transportation • Public transit
Engineering:	• Stormwater management • Noise during construction
Utilities / Services:	• Water services and sewage • Municipal infrastructure • Hydro • TransCanada pipeline

Some of the potential impacts associated with the Preferred Design Concepts include:

- Permanent changes to access to some residential and employment land uses;
- Temporary disruption to residents, businesses, and road users during construction due to increased noise, dust, traffic delays, and access;
- Potential to impact Redside Dace (SAR) habitat during extension of Culverts 8 and 10 associated with Levi Creek South and Levi Creek North;

- Potential to impact Barn Swallow (SAR) if properties to be acquired include structures that have open barns, and/or as part of extensions of structural culverts 3, 8 and 10;
- Potential to impact Bobolink (SAR) if properties to be acquired include suitable habitat for the species;
- Potential to impact Levi Creek Wetland Complex PSW associated with Levi Creek South and North;
- Removal of some roadside vegetation and some mature trees;
- Impact to seven cultural heritage landscapes and built heritage resources, requiring a heritage impact assessment to understand impact; and
- Impact to archaeological resources requiring the need for additional investigations during detailed design.

Commitments to Future Work

In addition to the mitigation measures proposed in this report, the Region of Peel has made commitments to examine and incorporate certain items during the detailed design stage of the project to minimize and where possible avoid the potential impacts identified during this Study. These commitments to address potential impacts are outlined below in **Table ES-2.**

Table ES-2: Region of Peel's Commitments to Future Works

Potentially Impacted Features	Region of Peel's Commitments to Future Work
Terrestrial Vegetation:	• Replanting trees in nearby locations to compensate for tree removal activities. • Restoration of disturbed areas immediately after construction is completed.
Wildlife:	• Undertake additional studies during detailed design to identify if the hibernaculum is located within the construction footprint. • Undertake nesting surveys prior to construction commencement. • Develop and implement an illumination plan during detailed design that reduces impact to wildlife resulting from increased light pollution.
Species at Risk:	• Minimize work within the watercourse channel to minimize the potential impact to Redside Dace. • Limit construction activities to periods outside of sensitive bird breeding windows. • Undertake additional surveys (where required) to confirm presence of suitable Bobolink habitat.

Potentially Impacted Features	Region of Peel's Commitments to Future Work
Watercourses/Wetlands:	• Reduce impacts to watercourses, provincially significant wetlands, and marsh areas associated with Levi Creek South and Mullet Creek, including the implementation of an Erosion and Sediment Control Plan. • Develop plan during detailed design for ground improvements and in-water work for culvert extensions.
Archaeology, Built Heritage, and Cultural Heritage:	• Undertake a Stage 3 Archaeological Assessment to confirm the need for a Stage 4 excavation within Mount Zion Cemetery. • Conduct a cemetery investigation to confirm that there are no burial features present within the effected areas. • Implement an avoidance strategy including a temporary barrier along the interface between the protected area and the project limits during construction. • Prepare a Heritage Impact Assessment to document direct impacts to affected built heritage and cultural heritage properties.
Residential/Commercial Properties:	• Provide compensation for property purchases in accordance with the Region of Peel and Halton Region policies. • Develop traffic management plans to be implemented during construction to reduce congestion and maintain safe access to residential homes and commercial establishments during construction. • Completion of Phase 1 ESA prior to land acquisition by Region of Peel.
Safety / Access / Farm Vehicles	• Maintain communication during construction to keep the public, and agencies informed of potential delays / detours.
Active Transportation	• Conduct feasibility study of extending MUP across Hwy 401 structure (east side) and connecting to City of Mississauga facilities. • Implement cross rides with bicycle traffic signals at signalized intersections where feasible to increase the comfort, convenience, and safety of cyclists along the corridor. • Step the stop-bars back from pedestrian crossings and cross rides at all intersections to improve sightlines. • Maintain 3.0 m clear space throughout entire multiuse path/trail to allow for adequate equipment to clear the multiuse path /trail

Potentially Impacted Features	Region of Peel's Commitments to Future Work
	in winter. Ensure that pinch points at intersections are avoided.
Public Transit	• Incorporate bus stops, design features, and transit priority measures as required by transit providers. • Consult with City of Brampton regarding potential changes to transit along the corridor during detailed design. • During detailed design for the section of the corridor between Steeles Avenue and Highway 401 (south limit) consider incorporation of transit priority measures including transit signal priority, queue jump and bypass lanes and bus stop relocation.
Infrastructural Ontario (IO) Property	• Complete an IO EA during detailed design for the property to be acquired from the Province between Highway 401 E-N/S ramp and Meadowpine Boulevard. • Region of Peel / Halton Region to revisit access during detailed design to determine opportunity for direct access to Winston Churchill Blvd for property located in the northwest quadrant of 407ETR and Winston Churchill Blvd.
MTO	• During detailed design, review opportunities to reduce property impacts. • Coordination with MTO during detailed design of Winston Churchill Blvd Class EA regarding lane configurations and tie-in points for a future Hwy 413 interchange. • Coordination with MTO/Brampton/Peel regarding the location of the Financial Drive intersection.
Stormwater Management	• Stormwater management strategy was developed in consultation with CVC and will control quantity increases to pre-development conditions. • Hydraulic modelling to be completed during detailed design to assess impacts of road widening and structural design of three regulated watercourse crossings. • Stormwater management criteria shall meet all requirements of the Regional of Peel and Credit Valley Conservation Authority and additional criteria identified within this Study. • Detailed design of bioretention facilities and stormwater planters to be prepared during detailed design.

Potentially Impacted Features	Region of Peel's Commitments to Future Work
	• At the Detailed Design Stage, re-assess the EA recommendations against the CLI ECA criteria and make the necessary adjustments and changes to the stormwater recommendations to be in compliance. • During Detailed Design discussions with the Region's operations staff will be required for understanding and developing regular maintenance procedures of LID features.
Water Services and Sewage	• Consider potential water servicing solutions during construction.
Municipal Infrastructure	• Review potential for impacts to watermains during detailed design. • Review opportunities for watermain extension construction at same time as Winston Churchill Blvd improvements. • Review the need for a separate eastbound left turn lane at the Embleton Road intersection with Winston Churchill Blvd.
Illumination	• Illumination Design to be completed to confirm location of poles along full length of corridor. • The need for lighting for the MUP on the west side of Winston Churchill Blvd from Steeles Avenue to Embleton/5 Sideroad to be reviewed during detailed design.
Hydro	• Potential impacts to minimum span requirements resulting from grade differentials will be addressed during detailed design. • Impacts and easement requirements will be determined during detailed design.
TransCanada Pipeline	• Written approval from TransCanada to be acquired should grading affect ROW or drainage.

Implementation Schedule

Land acquisition is planned to occur starting in early 2026, through until late 2027/early 2028. Followed by utility relocation, construction is anticipated to commence in 2028 as follows:

1. Widen Highway 401 to Steeles Avenue from 4 to 6 lanes. Improvements to Steeles Avenue intersection planned to commence in 2028.
2. Widen the segment 2 km south of Embleton Road to Embleton Road from 2 to 4 lanes, construction to commence in 2028.

3. Widen the segment 2 km south of Embleton Road to Embleton Road from 4 to 6 lanes, construction to commence in 2034.
4. Widen the segment from Steeles Avenue to 2 km south of Embleton Road from 4 to 6 lanes, construction to commence in 2034.

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Glossary of Terms and Acronyms

Term / Acronym	Meaning
AAQC	Ambient Air Quality Criteria
ANSI	Area of Natural and Scientific Interest
ATMP	Active Transportation Master Plan
Blvd.	Boulevard
BHR	Built Heritage Resource
CAA	*Conservation Authorities Act*
CAAQS	Canadian Ambient Air Quality Standard
CAV	Connected Automated Vehicles
CBOP	City of Brampton Official Plan
CHL	Cultural Heritage Landscape
CSS	Context Sensitive Solutions
CVC	Credit Valley Conservation
COSEWIC	Committee o the Status of Endangered Wildlife in Canada
DDG	Design Development Guidelines
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAA	*Environmental Assessment Act* (Ontario)
ECA	Environmental Compliance Approval
ESR	Environmental Study Report
GGH	Greater Golden Horseshoe
GHG	Greenhouse Gas
GPGGH	Growth Plan for the Greater Golden Horseshoe
HHSP	Heritage Heights Secondary Plan
Hwy	Highway
IAA	*Impact Assessment Act*
IO	Infrastructure Ontario
Km	Kilometre
LCV	Long Combination Vehicles
LOS	Level of Service
LRATP	Long Range Active Transportation Plan
LRTP	Long Range Transportation Plan
MEA	Municipal Engineers Association
MECC	Ministry of the Environment and Climate Change
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MLF	Maple Lodge Farms
MNR/ MNDMNRF/ MNRF	Ministry of Natural Resources/Ministry of Natural Resources and Forestry. The Department of Lands and Forests became the Ministry of Natural Resources in in 1972. The Ministry of Natural resources

	changed its name to the Ministry of Natural Resources and Forestry on June 24, 2014. In June 2021, Northern Development, mines, natural resources, forestry and Indigenous affairs all merged into one portfolio. In June 2022, the agency returned to MNRF. Thus, MNR, MNDMNRF and MNRF are considered to be synonymous for the purposes of this Report.
MOE/MOEE/ MOECC/MECP	Ministry of the Environment/Ministry of the Environment and Energy/Ministry of the Environment and Climate Change. The Ministry of the Environment was created in 1972 and merged with the Ministry of Energy to form the Ministry of Environment and Energy (MOEE) from 1993 to 1997 and again in 2002. The Ministry of the Environment changed its name to the Ministry of the Environment and Climate Change (MOECC) on June 24, 2014. The Ministry changed its name to Ministry of the Environment, Conservation and Parks (MECP) on June 29, 2018. Thus, the MOE/MOEE/MOECC and MECP are considered to be synonymous for the purposes of this Report.
MTO	Ministry of Transportation Ontario
MUP	Multi-use Path
NAAQS	National Ambient Air Quality Standards
NER	Natural Environment Report
NHIC	Natural Heritage Information System
OBBA	Ontario Bird Breeding Atlas
OGS	Oil and Grit Separators
O. Reg.	Ontario Regulation
LOS	Level of Service
PIC	Public Information Centre
PPS	Provincial Policy Statement
PTTW	Permit To Take Water
RPOP	Region of Peel Official Plan
SAR	Species at Risk
Study Area	4.2 km section of Winston Churchill Boulevard from Highway 401 to Embleton Road.
TAC	Technical Advisory Committee
TDM	Transportation Demand Management
TMP	Transportation Master Plan

1. Introduction

1.1 Introduction

The Regional Municipality of Peel (Region of Peel) initiated a Schedule 'C' Municipal Class Environmental Assessment (Class EA) Study (the "Study") to examine the need and justification for improvements to Winston Churchill Boulevard from Highway 401 to Embleton Road (captured in **Figure 1-1**). Winston Churchill Boulevard is a Regional Boundary Road, between the Region of Peel and the Halton Region, as well as being a north-south arterial road forming the boundary between the City of Brampton, City of Mississauga and the Town of Halton Hills.

Hatch (formerly Hatch Mott MacDonald (HMM)) was retained by the Region of Peel to undertake the Study for Winston Churchill Boulevard to assess the need for road improvements to accommodate existing and future traffic demands, and ultimately provide a preferred design that best addresses the issues within the Study Area along Winston Churchill Boulevard.

In 1996 the Region of Peel completed a Class EA for the widening of Winston Churchill Boulevard between Steeles Avenue and Embleton Road. The preferred design alternative was to widen Winston Churchill Boulevard to three lanes from Steeles Avenue to Maple Lodge Farms and upgrade the remaining portion to current standards. The report, although dated, provides valuable insight for the present EA.

The *Region of Peel Long Range Transportation Plan* (LRTP) (2019) identifies long-term transportation network issues in the Region and proposes roadway infrastructure improvement as one element of the solution to these issues. This includes the widening of Winston Churchill Boulevard to six lanes between Steeles Avenue and Embleton Road by the year 2031. The purpose of the proposed roadway improvement is to address planned future growth, operational and servicing deficiencies, and road link capacity limitations. The Study also reviewed opportunities to accommodate and encourage alternative modes of transportation, including walking, cycling, and access to public transit along both sides of the corridor.

The LRTP identified the need to widen a 4.2 km section of Winston Churchill Boulevard from Highway 401 to Embleton Road to accommodate existing and future transportation needs.

The Study is being led by the Region of Peel in accordance with the Peel/Halton Boundary Road Agreement. While the Region of Peel will be responsible for leading the efforts, the Project is considered a shared project, and in accordance with the Terms of the Agreement, the Region of Peel has involved Halton Region in each step of the EA.

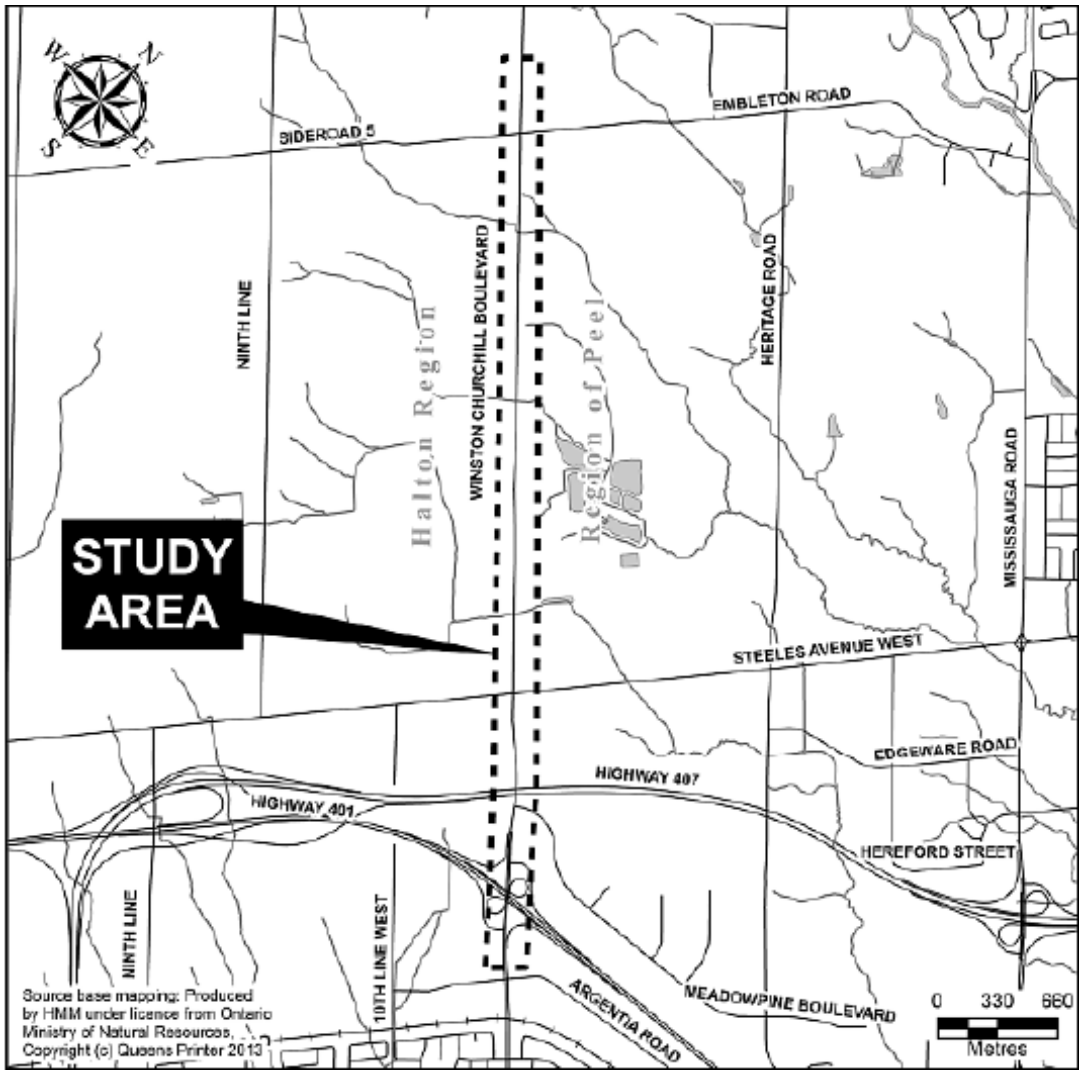

Figure 1-1: Study Area

1.2 Purpose of the Project

In order to best address deficiencies (short-term and long-term issues related to future growth, capacity, operation, and accommodation of multimodal users along Winston Churchill Boulevard from Highway 401 to Embleton Road), a number of road improvement alternatives were identified as part of the Class EA process, including several solutions for widening the roadway, cross-section improvements, intersection improvements, and accommodation of active transportation. In addition, the impact of such improvement on the socio-economic and natural environments was examined.

A major objective of the Study was to undertake consultation with a wide range of stakeholders in order to identify and resolve or mitigate issues of concern, while meeting the

requirement of the Class EA process to permit the Region of Peel to proceed to detail design and construction of the preferred design concept. The Study addresses the following specific deficiencies and concerns:

- Accommodate existing and future transportation demands;
- Enhance the aesthetics and streetscaping through the corridor;
- Address any geotechnical deficiencies and opportunities related to stormwater management;
- Accommodate active transportation, namely for pedestrians and cyclists, throughout the corridor; and
- Provide opportunities for improved access to transit.

The need for and justification for roadway improvements are discussed Section 4.

1.3 Environmental Study Report

The Environmental Study Report (ESR) documents the planning and decision-making process followed meeting each of the four Phases of the Class EA. The Class EA process is discussed in further detail in **Section 2**. This report identifies and evaluates the alternative solutions and alternative design concepts to select the technically preferred preliminary design concept. The ESR is finalized with the issuance of a Notice of Completion inviting the public to review and provide input on the document within the 30-calendar day review period. The Notice will identify the location(s) where the ESR can be reviewed.

2. Class Environmental Assessment Process

2.1 Municipal Class Environmental Assessment Process

The purpose of the Study is to identify a solution to address the identified deficiencies along the 4.2 km section of Winston Churchill Boulevard by following the Schedule C Municipal Class EA process. The scope for Schedule C projects includes completion of Phases 1 through 4 of the Class EA process as follows:

- **Phase 1**: Identify the problem and opportunity related to transportation within the Study Area.
- **Phase 2**: Evaluate Alternative Solutions to address future travel demands, and select a Preferred Solution to address the problem and opportunity statement.
- **Phase 3**: Evaluate Alternative Design Concepts and select a Preferred Design Concept.
- **Phase 4**: Prepare and file an ESR for a minimum 30-day review period. The ESR documents the Class EA process, including mitigation and other commitments to implement the proposed improvements.

Consultation is required throughout all phases to receive input from the public, stakeholders, review agencies, and Indigenous communities and groups.

Under the provisions of Ontario's *Environmental Assessment Act* ("EA Act") (R.S. O. 1990, c. E. 18) and Ontario Regulation (O. Reg.) 334, certain types of provincial and municipal undertakings can meet the requirements of the Act using an approved environmental planning process referred to as a Class EA.

The Municipal Class EA process is a self-assessing procedure by which a Group or "Class" of undertakings can be planned and implemented in a way that fulfills the requirements of the Act without proponents having to prepare an Individual EA for approval. These undertakings do not require formal submission to the Ministry of the Environment, Conservation and Parks for approval. Upon completion of the appropriate process, the undertaking is considered approved.

All municipal road reconstruction or widening Projects in Ontario require approval under the EA Act. As individual EAs can be quite onerous, as well as time consuming, to assist municipalities in undertaking many infrastructure Projects each year, the Municipal Engineers Association (MEA) (dated October 2000, as amended in 2007, 2011 and 2015) Municipal Class EA process allows for planning of municipal infrastructure to be undertaken in accordance with an approved procedure designed to protect the environment. The Municipal Class EA process provides the decision-making framework that enables the requirements of the EA Act to be met in an effective manner

The Municipal Class EA outlines the approved process for the planning and decision-making process for municipal infrastructure projects. Figure 2-1 summarizes the five phases of this process. As the figure notes, the public, stakeholders, review agencies, and Indigenous communities and groups are engaged to solicit input and comments at key consultation milestones. This input is essential to ensure that issues are identified early in the process and can be addressed prior to moving forward and making final recommendations.

The Municipal Class EA process recognizes that there are varying levels of impact requiring a greater or lesser amount of assessment, depending on the nature of the work, the estimated cost, and the potential impacts on the environment (which include natural, social, economic, cultural and technical). There are four levels or "schedules" of undertakings defined in the Municipal Class EA to account for this variation, being:

- **Schedule A**: These projects are limited in scale and include emergency operational and maintenance activities. Schedule A projects are deemed pre-approved without the need for further assessment.
- **Schedule A+**: As introduced in the 2007 amendment to the Municipal Class EA, Schedule A+ projects are also pre-approved, but require the proponent to advise the public of the initiative prior to implementation.
- **Schedule B**: These projects have the potential for some adverse environmental effects and include improvements and minor expansions of existing facilities. For Schedule B projects, the proponent must undertake a screening process, including consultation with those who may be affected by the undertaking. At the conclusion of the process, the proponent prepares a Project File, often in the form of a report, to document the findings.
- **Schedule C**: These projects have the potential for significant environmental effects and include new facilities and major expansions to existing facilities. Schedule C projects must follow the full planning and consultation process outlined in the Class EA, including the preparation of an Environmental Study Report.

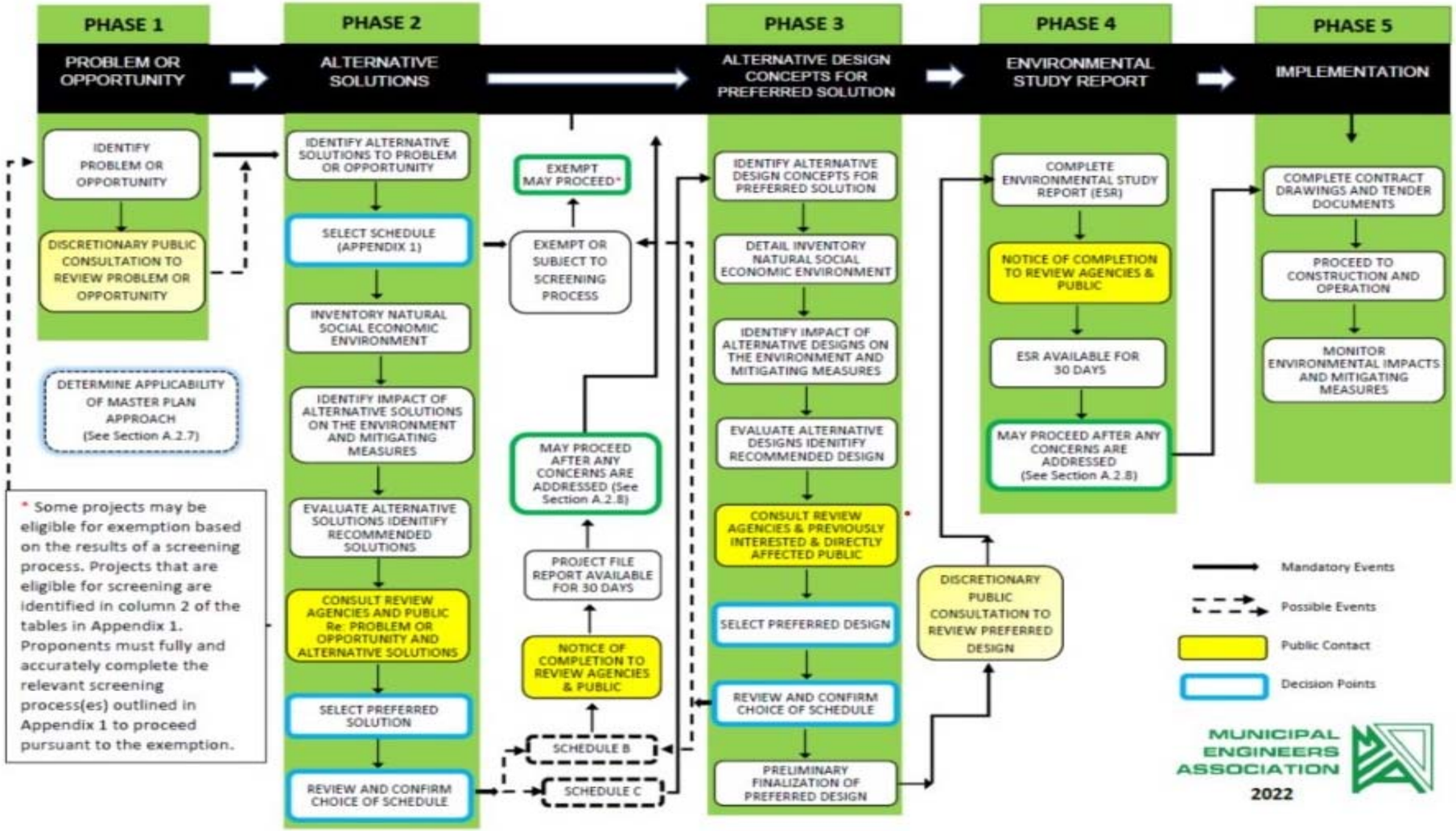

Figure 2-1: Municipal Class EA Process

2.1.1 Section 16(6) Order

It is recommended that all stakeholders work together to determine the preferred means of addressing the problem. If concerns regarding the project cannot be resolved through discussions with the proponent (for this Study, the proponent is Peel Region), the person or party raising the objection may request that the MECP elevate the level of study through a Section 16(6) order or "bump up" request, formerly referred to as a Part II Order, which may require the completion of an individual/comprehensive EA or that additional conditions be imposed before being able to proceed.

Section 16(6) Orders will only be permitted to prevent, mitigate, or remedy potential adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered.

Order requests should clearly identify the reason for the request, whether additional conditions are to be imposed or if an individual/comprehensive EA should be undertaken, and include the requester's contact information.

The Minister may also submit a Section 16(6) Order on their own behalf and impose conditions or elevate the level of study. Requests by the Minister must be submitted within 30 days of the end of the comment period following the Notice of Completion, unless otherwise stated.

The order request must be sent to both the Minister and the Director of the Environmental Assessment and Permissions Branch noted below and Peel Region's Project Manager prior to the end of the 30-day public review period. If no requests are received and subject to the receipt of the necessary approvals, Peel Region intends to proceed to implementation of the Project, that is, detailed design and construction. Order requests should be sent in writing or by e-mail to:

Minister of the Environment, Conservation and Parks
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto, ON M7A 2J3
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3. Regulatory / Planning Context

The following sections outline the federal, provincial, regional and local municipal policies and plans relevant to the Study. Since Winston Churchill Boulevard is a boundary road this section includes regulations from the Region of Peel (the Proponent) and Halton Region, as well as City of Brampton, Town of Halton Hills, and the City of Mississauga.

3.1 Federal Legislation

3.1.1 Impact Assessment Act

Under the *Impact Assessment Act* (IAA) (S.C. 2019, c. 28, s. 1), a federal Impact Assessment (IA) may be required for activities identified as "designated projects", which are listed in the Physical Activities Regulations (SOR/2019-285). The purpose of the Project List is to help ensure that federal Impact Assessments focus on major projects which have a higher likelihood of causing significant adverse environmental effects.

This Study is not considered to be a designated project and therefore does not require a federal IA.

3.2 Provincial Planning Policies

3.2.1 Provincial Policy Statement, 2020

The Provincial Policy Statement (PPS) was issued under section 3 of the *Planning Act* (R.S.O. 1990, c. P. 13) and came into effect May 1, 2020, for matters of provincial interest related to land use planning and development. The statement aims to provide direction for appropriate development while protecting public health and safety, and the quality of both the natural and built environment. The PPS states that to maintain Ontario's long-term prosperity, environmental health and social well-being, land use and development within Ontario must be properly managed. The PPS contains several objectives related to transportation planning, including:

- Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs;
- Efficient use shall be made of existing and planned infrastructure, including the use of transportation demand management strategies, where feasible;
- A land use pattern, density and mix of uses should be promoted that minimize the length and number of vehicle trips and support current and future use of transit and active transportation; and
- As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be maintained and, where possible, improved including connections which cross jurisdictional boundaries.

This Study is aligned with the transportation planning objectives stated in the PPS and will help guide the long-term growth of Ontario.

3.2.2 *A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020*

Under the provisions of the *Places to Grow Act* (S.O. 2005, c. 13*)*, the initial regional growth plan known as the *A Place to Grow: Growth Plan for the Greater Golden* Horseshoe (GPGGH) was originally created and adopted by the Government of Ontario in 2006 and most recently consolidated in 2020. Since the Plan's inception, there have been initiatives for better land-use planning through the development of urban growth centres and other strategic growth centres, and improvements to transportation planning through investment in regional transit. The GPGGH seeks to build upon the 2006 framework and guide the growth in the Greater Golden Horseshoe (GGH) area through integration of land use, infrastructure planning and public services, intensification efforts, protection and enhancement of natural and cultural heritage resources, and promotion of diverse and sustainable communities.

The GPGGH works in conjunction with other provincial policy and planning documents including the PPS, Greenbelt Plan, Oak Ridges Moraine Conservation Plan (ORMCP) and Niagara Escarpment Plan (NEP). The goals and policies of the GPGGH to build complete and prosperous communities are targeted to be achieved by 2041, the horizon year for the growth plan. These goals and policies pertain to important issues such as transportation, infrastructure, land-use planning, urban form, affordable housing, natural heritage, resource protection and resiliency against climate change. In particular, the GPGGH provides population and employment forecasts for municipalities across the GGH, and develops principles to accommodate the projected growth through the design of complete communities.

The GPGGH's policies on transportation focus on providing connectivity for people and goods through a multi-modal, safe, efficient and sustainable transportation network. The integration of land-use planning and transportation investments is key in implementing the plan. The GPGGH prioritizes transit as a major transportation investment. The specific criteria for transit planning and investment decisions require ensuring that areas with existing or planned higher residential or employment densities are prioritized, capacity of existing systems are increased to support strategic growth areas, service is expanded to areas with transit-supportive densities and better regional linkages are made available between municipalities. The GPGGH also identifies the need to provide better connectivity for active transportation users between strategic growth areas, major trip generators and transit stations. Infrastructure needed to increase the modal share of active transportation include dedicated lanes for bicyclists on the major street network, secure bicycle parking facilities, and sidewalks with minimal interruptions for vehicular access.

3.2.3 *The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area, 2008*

In accordance with the *Metrolinx Act* (S.O. 2006, c. 16), the province created Metrolinx to develop, fund, coordinate and promote transportation with in the GTHA municipalities. In 2008, Metrolinx developed a Regional Transportation Plan (RTP) for the GTHA, entitled *The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area*, which includes a seamless, integrated transportation network with a focus on public transit.

The plan outlines a 25-year vision for sustainable transportation in the GTHA, as well as policies, programs and infrastructure investments to meet the vision. In relation to the Study Area, the RTP identifies the following improvements as part of the 15-year plan and the 25-year plan for the GTHA:

- 15-year Plan:
  - Hurontario rapid transit from Port Credit to Downtown Brampton;
  - Brampton's Queen Street AcceleRide;
  - Express Rail will also be extended to Downtown Brampton, along with more frequent, two-way all-day Regional Rail service to the urban growth centres of Downtown Milton, Richmond Hill/Langstaff Gateway, Markham Centre and Etobicoke Centre; and
  - Arterial road widenings and extensions will be added to the road system, in accordance with the 10-year municipal road programs and longer-range road network expansion plans in the Transportation Master Plans of the Cities of Toronto and Hamilton and the regional municipalities of Halton, Peel, York and Durham.
- 25-year Plan:
  - Rapid transit on Steeles Avenue in Brampton will connect the Lisgar GO Station to Highway 427. The plan also includes policies related to goods movement, Active Transportation (AT) and transit to be considered in developing and improving infrastructure.

3.2.4 Metrolinx 2041 Regional Transportation Plan

In the Fall of 2017, Metrolinx released the *2041 Regional Transportation Plan* (RTP) for the GTHA to outline the work required to build an integrated, regional, multimodal transportation system to serve the area residents and visitors over the upcoming 25 years. The RTP builds on the successes of The Big Move (2008). Full implementation of the plan will result in a more reliable and frequent transit system, to make travel more affordable while reducing the need to own a car. The RTP's focus will be on putting the traveller needs first in the planning and operations of the system by:

- Providing access to fast, frequent and reliable transit;
- Integrating fares and services for a more seamless connection;
- Designing communities, transit stations and hubs to support transit and active transportation;
- Preparing for integrated mobility systems that focus on emerging transportation technologies;
- Implementing parking demand strategies to encourage carsharing and other modes;

- Consideration for the first and last mile of travellers journeys;
- Optimize roads and highways to support transit and goods movement; and
- Incorporating design excellence, sustainability and access into transit planning.

The 2041 RTP identified a full range of regionally significant transit projects as part of the Frequent Rapid Transit Network (FRTN). Project #69 Steeles West of the FRTN is identified as a Priority Bus corridor between Milton GO Station and Jane Street, providing critical east-west transit connectivity to major destinations. A segment of this project runs along Winston Churchill Blvd to access Lisgar GO Station from Steeles Avenue, which falls within the southern terminus of the ESR project limits. Infrastructure improvements proposed along the Winston Churchill Boulevard corridor could consider transit priority measures to further encourage multimodal travel. These measures might include transit signal priority, queue jump and bypass lanes and bus stop relocation.

3.2.5 *Accessibility of Ontarians with Disability Act, 2005*

The *Accessibility for Ontarians with Disability Act* (AODA) (S.O. 2005, c. 11) seeks to ensure accessibility for Ontarians with disabilities with respect to goods, services, facilities, accommodation, employment, buildings, structures and premises. The AODA became law in June 2005 and is required to be fully implemented throughout Ontario by 2025. The Act requires the identification and removal of barriers to transportation services provided by transportation providers, municipalities, and other bodies such as universities and school boards across the province.

3.2.6 *Clean Water Act, 2006*

The *Clean Water Act* (S.O. 2006, c. 22) was passed in 2006 to identify how Drinking Water Source Protection will be carried out in Ontario. The Act established committees for Source Protection Areas and regions to identify existing and future risks to their municipal drinking water sources, as well as to identify plans to address these risks.

The Credit Valley, Toronto and Region and Central Lake Ontario Areas are covered under the CTC Source Protection Region which spans more than 10,000 square kilometres and 33 municipalities. The Committee undertook a technical assessment of municipal water sources to identify potential vulnerabilities and prepare a Source Protection Plan.

Portions of the Study Area are identified as Highly Vulnerable Aquifers for groundwater. Any activities that include dewatering an aquifer within this area are subject to the policies listed in the CTC Source Protection Plan. Any area identified as having significant or moderate drinking water stress has also been identified as an area where significant drinking water quantity threat activities can occur. In the event that a Permit to Take Water (PTTW) is required (i.e., >50,000 litres/day) to accommodate improvements along the corridor, the province will review the request to determine if the water taking is sustainable and issue the PTTW with conditions to protect the ecosystem.

The Study Area is not located near municipal wells and water is not expected to be taken directly from the municipal water supply aquifer. It should be noted that there are a number of private wells located on both sides of the roadway.

3.2.7 *Consideration of Climate Change in Environmental Assessment in Ontario, 2017*

The MECP has prepared a guide titled *Considering Climate Change in the Environmental Assessment Process* (2017) to outline how the EA process can incorporate consideration of climate change impacts including:

- The effects of a project on climate change;
- The effects of climate change on a project; and
- Various means of identifying and minimizing negative effects during the project design. Consideration of climate change is meant to result in a project that is more resilient to future changes in climate and to maintain ecological integrity of the local environment in the face of a changing climate.

The guide states that proponents should take into consideration climate change mitigation and adaptation during the evaluation of alternative solutions and alternative design concepts.

3.2.8 *GTA West (Highway 413) Transportation Corridor Route Planning and Environmental Assessment Study, Ongoing*

The GTA West Corridor EA was approved by the MOE in 2008 and Stage 1 of the GTA West Transportation Corridor Route Planning ("GTA West Study") and EA Study was completed in 2012. Stage 2 of the EA Study (ongoing) is to build upon the recommendations provided during Stage 1, identify a route, and determine interchanges within the Route Planning Study Area. The purpose of the GTA West (Highway 413) Study is to address the long-term inter-Regional transportation problems and opportunities and consider alternative solutions to address these issues using an integrated, multi-modal transportation system that enables the efficient movement of people and goods, and providing better transportation linkages between Urban Growth Centres in the Western GTA. The new multimodal transportation corridor includes a 400-series highway, transitway and potential goods movement priority features.

The Study Area is bounded by Highway 401 and 407 (at the 401/407 linkage) in the south, Highway 400 to the east, Highway 6 in the west, and the Towns of Erin, Caledon, and Bolton in the North. The Study identified the area South of Mayfield Road east of Winston Churchill Boulevard (City of Brampton), and West of Winston Churchill Boulevard (Town of Halton Hills) as areas where future urban expansions of large development proposals would likely occur resulting in potential concerns with potential transportation network plans.

The GTA West (Highway 413) corridor currently includes a future interchange including ramps connecting with Winston Churchill Boulevard, south of Embleton Road. These details are subject to further planning study.

In addition to the Highway 413 Corridor study, MTO has been completing improvements to Highway 401 that include a widening of the highway and construction of a new carpool parking lot in the northwest quadrant of the Highway 401 – Winston Churchill Boulevard interchange, revisions to the East-North/South ramp, as well as the South-West ramp. Discussions with the MTO will continue during detailed design regarding active transportation connectivity over the Highway 401 structure.

3.3 Regional Planning Policies

3.3.1 Region of Peel

3.3.1.1 Region of Peel Official Plan, 2021

The Region of Peel is expecting significant growth and has developed the *Region of Peel Official Plan* (RPOP) to guide the growth of the Region to the year 2031 for the Urban System. The RPOP applies to the combined areas of the City of Brampton, the City of Mississauga, and the Town of Caledon. The most recent consolidation of the RPOP was in 2021, and as of 2022 the plan is under review to respond to the updated 2051 planning horizon introduced in Amendment 1 to the Growth Plan for the GGH (2020), which projected that the GGH is forecasted to grow to almost 15 million people and over 7 million jobs by 2051. The population of the Region of Peel is projected to grow to 1.64 million with the number of jobs reaching 870,000 by the year 2031; with the City of Brampton expected to reach a population of 727,000 and an employment population of 314,000.

The RPOP was established to address issues from a growing population and employment by the Region. An all-encompassing sustainable development framework that integrates environmental, social, economic and cultural imperatives will assist in guiding the growth and development within the Region of Peel, while having regard for mitigating impacts to the environment in an effective and efficient manner.

Furthermore, the RPOP states that the transportation system is intended to accommodate current and future travel demands for those who reside, work or travel through the Region, and that planning for this system must be coordinated to protect the rights-of-way and to ensure the integration within the area and with adjacent municipalities. Furthermore, Winston Churchill Boulevard is identified as a Major Road, which is to provide inter- and intra-municipal travel within and outside of the Region. Additionally, the Plan expresses the importance of these road networks for the movement of people and goods by automobile, transit, and bicycle.

3.3.1.2 Peel Long Range Transportation Plan, 2019

Due to the rapid population and employment growth in the Region of Peel, there has been an increased demand on the transportation network. The LRTP (2019) builds upon related

provincial and regional policies and provides a policy framework for accommodating the projected population growth up to 2041 and identifying current and future transportation network trends. The current network trends include 50% mode share requiring a 13% reduction in single-occupant vehicles and 13% increase in sustainable modes to support the growth of the Region.

The LRTP, conducted as a Transportation Master Plan Study under the Municipal Class EA process, considered several alternative solutions, and provided recommendations to address current issues related to transportation efficiency and sustainability. A combination of traffic demand management with active transportation programs and roadway infrastructure improvement was identified as the preferred solution to address the current deficiencies in the transportation network. This solution would be the most beneficial for reducing congestion levels, while minimizing the negative impacts from an environmental, social, cultural heritage, and economic perspective.

In addition to being classified as a Municipal Boundary Road, Winston Churchill Boulevard is also identified in the LRTP as a roadway that could potentially be included in the proposed cycling network. The Plan indicates the need for an increase to six lanes on Winston Churchill Boulevard from Steeles Avenue to Embleton Road by the year 2031. Additionally, Winston Churchill Boulevard has been included as a key component of the Recommended Road Improvement Schedule, proposed to be completed by 2031.

3.3.1.3 Region of Peel Active Transportation Implementation Plan 2018-2022, 2018

The *Region of Peel Active Transportation Implementation Plan* (ATP) (2018) was developed to discuss targets to expand existing programs and develop new strategies to encourage and support active transportation (walking, cycling, and rollerblading) across the Region of Peel. The Plan has eight key themes and strategic actions which are described in **Table 3-1.**

Table 3-1: Region of Peel Active Transportation Implementation Plan - Key Themes and Strategic Actions

Mode	Key Theme	Action Item
Multimodal	Make Roads Safer for Vulnerable Users	• Encourage local municipalities to strengthen zoning by-laws to reduce parking requirements and support sustainable travel modes through infrastructure and context sensitive design • Improve development approval process to support sustainable transportation through infrastructure, design and Transportation Demand Management (TDM) • Update Regional Road design standards to ensure access, safety and comfort for walking and cycling
	Influence Personal Travel Decisions	• Deliver special events, information, and messaging across the Region • Deliver TDM social marketing to priority areas • Support Smart Commute to promote walking, cycling,

		transit, carpooling and teleworking • Encourage and support walking and cycling to and from schools • Support sustainable travel choices through new mobility technologies business models • Provide learning opportunities for stakeholders • Improve sustainable travel options for Regional employees and implement parking pricing at regional workplaces
	Strengthen the Region's Leadership Role	• Undertake road safety pilot projects
Walking	Provide Comfortable Continuous walking routes	• Identify and prioritize solutions to major walking barriers • Identify pedestrian improvement areas and implement measures to improve walkability • Improve winter maintenance for walking facilities • Promote walking for short trips
Cycling	Provide Comfortable Continuous cycling facilities	• Implement Cycling Network • Identify and prioritize solutions to major cycling barriers • Identify and remove minor cycling barriers • Improve year-round maintenance standards for cycling facilitates • Develop priority winter maintenance network for regional cycling facilities
	Expand Bicycle parking and end-of-trip facilitates	• Provide bicycle parking in Regional rights of way • Support provision of bicycle parking and end-of-trip facilities at community destinations • Promote cycling for short and medium length trips
	Promote Cycling Across the Region	• Promote winter cycling • Provide cycling skills training • Build capacity through community-based programs • Build cycling culture with a bike friendly business program
Transit	Improve Connections to Transit	• Improve First and Last Mile Access to Transit Hubs and Along Corridors

Within the Study Area, the ATP identifies proposed Active Transportation facilities including:

- Multi-use trail (MUT) along the east side of Winston Churchill Boulevard from Highway 401 northerly to Norval;
- MUT on Timberline Drive from Winston Churchill Boulevard easterly;

- MUT on Steeles Avenue from Winston Churchill Boulevard easterly and paved shoulder westerly;
- Bike lanes on Embleton Road; and
- Paved shoulders along Winston Churchill Boulevard from Embleton Road north in the short term, and MUT from Embleton Road to Mayfield Road in the ultimate condition (coordinated with Halton Region and Halton Hills).

3.3.1.4 Peel Region Goods Movement Strategic Plan 2017-2021, 2017

The Region of Peel is situated at the junction of some of North America's most important east-west and north-south trade routes, with an estimated $1.8 billion worth of commodities travelling to, from and through Peel every day, making the Region a crucial freight hub for Canada and a significant pillar of the regional economy. The Goods Movement Strategic Plan (GMSP) is a five-year blueprint for action for goods movement in Peel Region, and is directly connected to the LRTP described in Section 3.3.1.2. The plan serves as an update to the original 2012 – 2016 Goods Movement Strategic Plan and was prepared concurrently with the Goods Movement Long Term Plan.

The GMSP assesses the feasibility of alternative economic districts, cross-municipal economic development partnership, identifying strategic locations for the movement of goods, and to develop a Region freight planning guide by incorporating MTO's freight-supportive guidelines. The desired outcomes of the GMSP included the following milestones:

- 2017 – Improvement to travel time by shifting peak deliveries to off-peak; Improvement to efficiency and productivity through the increased use of Long Combination Vehicles (LCVs);
- 2018 – Develop tools and resources to better plan and adapt to the shifting retail landscape; increase regional goods movement knowledge through education and outreach; and increase usage and awareness of alternative fuels and fuel efficiency initiatives;
- 2019 – Increased understanding and awareness of the impact of aggregate movement on the Regions communities and infrastructure, and increase the profile of Peel's goods movement industry across the country;
- 2020 – Facilitate land use planning to incorporate the goods movement sector; and
- 2021 – Implement the Connected Automated Vehicles (CAV) Pilot Project and policies to support it and the installation of other CV infrastructure.

As described in Section 3.3.1.6, the Region of Peel's Strategic Goods Movement Network Study (SGMNS) (2013) identifies Winston Churchill Boulevard as a part of the Potential Truck Network and the roadway from the 407ETR to Steeles Avenue is defined as a Primary Truck Route. Winston Churchill Boulevard will serve as a critical component of the Region's goods

movement improvements. Widening the roadway will increase the safety and efficiency of goods movement within the Study Area.

3.3.1.5 *Region of Peel Road Characterization Study, 2013*

The Road Characterization Study (2013) was developed to respond to the challenge of increased growth and development in the Region of Peel. A Context Sensitive Solutions (CSS) approach, which balances local land use contexts and needs of stakeholders with functional roadway design, was used for this project. The primary objectives of the project were to:

- Improve integration between transportation and land use;
- Support the Region's multi-modal transportation system; and
- Protect and maximize the current/future functionality and efficiency of the Region's arterial roads.

The section of Winston Churchill Boulevard within the Study Area is identified as an Industrial Connector. The Study provides a series of illustrative roadway cross sections to assist in developing changes to a Regional Road ROWs.

Table 3-2: Industrial Connector Characteristics

Area Context	Through Lanes	Desired Operating Speed	Transit Role	Pedestrian/ Facility Area	Bicycle Facilities	Drainage Conditions	Freight Role
Industrial and Warehousing Areas and Routes from those Areas to 400 Series Highways	4 to 6 (Professional judgment to be used if Climbing Lanes are necessary on steep grades)	60 to 80 km/h	Moderate to Major	Location Specific – Desired 1.5 m minimum sidewalk + Planting Zone + Splash Strip + Utility Zone	Recommend the use of professional judgment in high truck volume traffic areas where access points to adjacent uses or intersections are 300 m apart	Curb and Gutter or Rural Swale depending on adjacent uses	Yes

3.3.1.6 *Region of Peel Strategic Goods Movement Network Study, 2013*

The Region of Peel is located next to Canada's largest airport and two intermodal rail facilities, making the Region a multimodal goods movement hub and goods generating locality. The Region of Peel Strategic Goods Movement Network Study (SGMNS) was developed in 2013 to create a comprehensive hierarchical truck route network throughout Peel.

The SGMNS identifies Winston Churchill Boulevard as a part of the Potential Truck Network. From the 407 ETR to Steeles Avenue it is defined as a Primary Truck Route. The designation north of Steeles Avenue is currently undefined. A Primary Truck route is characterized as a route designed to facilitate general mixed traffic, while supporting significant truck movements, especially those connecting trucking activity clusters with Strategic Truck Routes (400 Highways/QEW). There is also the potential for transit expansions on Winston Churchill Boulevard from Steeles Avenue to Argentia Road.

3.3.2 Halton Region

3.3.2.1 Halton Regional Official Plan, 2018

The *Halton Regional Official Plan* (HROP) (2018) outlines a long-term vision for Halton's physical form and community character, setting goals and objectives to maintain the character of the landscape and quality of life within Halton using relevant Provincial legislation. The Plan uses the concept of sustainable development to guide decisions resulting in achieving the planning vision for the Region. Specific goals and objectives are set out for each feature of the community to assist the Region in achieving its vision.

The HROP states that the goal for transportation is to provide a safe, convenient, accessible, affordable, and efficient transportation system in Halton, while minimizing the impacts on the environment and promoting energy efficiency. There are many objectives for the transportation system in Halton, but the focus is on developing a balanced transportation system that:

- Reduces dependency on automobile use;
- Includes a safe, convenient, accessible, affordable and efficient public transit system that is competitive with the private automobile; and
- Promotes active transportation.

The HROP identifies Winston Churchill Boulevard as a Major Arterial Road in Map 3 – Functional Plan of Major Transportation Facilities.

Section 173 of the HROP outlines the following policy that is applicable to the Winston Churchill Boulevard MCEA Study:

1. Adopt a Functional Plan of Major Transportation Facilities, as shown on Map 3 and described in Table 3, for the purpose of meeting travel demands for year 2021 as well as protecting key components of the future transportation system to meet travel demands beyond year 2021.

The functions of a Major Arterial Road as defined in the Regional Official Plan, Table 3 are:

- Serve mainly inter-regional demands;
- May serve as Intensification Corridor;

- Accommodate all truck traffic;
- Accommodate higher order transit service and high occupancy vehicle lanes;
- Connect Urban Areas in different municipalities;
- Carry high volumes of traffic;
- Distribute traffic to and from Provincial Freeways and Highways; and
- Accommodate active transportation.

The intent of the HROP is to consult with regional, county, and local municipalities when planning or designing transportation facilities at or near a boundary, which includes Winston Churchill Boulevard as a boundary road between Halton Hills and the City of Brampton.

3.3.2.2 Halton Region Active Transportation Master Plan, 2016

The Halton Region Active Transportation Master Plan ("Halton Region ATMP"), 2016, recommends Regional Walking and Cycling Networks to support and encourage people to walk and bike around Halton. Active transportation is any form of human-powered transportation, including walking, cycling, rollerblading, skateboarding, and moving with mobility devices. An active transportation network includes sidewalks, multi-use trails, crosswalks, bike lanes and off-road trails. The objective of the Active Transportation Master Plan is to create a network that will make it easier for people to walk, bike and roll around Halton. The ATMP was a recommendation of the Halton Region Transportation Master Plan – the Road to Change to 2031 to facilitate and promote active transportation.

Winston Churchill Boulevard is a boundary road, as such, proposed facilities on this section of Winston Churchill Boulevard are programmed by Peel Region in accordance with the Halton/Peel Boundary Road Agreement.

3.3.2.3 The Road to Change: Halton Region Transportation Master Plan 2011

The Halton Region Transportation Master Plan (to 2031) – The Road to Change, (Halton Region TMP), 2011, was completed and meets Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process (October 2000, as amended 2007, 2011, and 2015). The purpose of the study was to develop a strategy that reflects Halton Region's transportation vision to 2031, which would be a dynamic integrated transportation strategy that considers all modes of travel.

The study provides the Region with the strategies, tools and policies needed to manage traffic safely, effectively and cost efficiently, to offer a range of transportation choices to meet the needs of Halton Region residents, to identify and protect future transportation corridors, and to identify the estimated costs and timing of transportation improvements.

Halton Region is responsible for planning, constructing, operating, maintaining, and improving a network of major arterial roads for the transport of goods and people in a safe and efficient

manner. The Regional road system connects the Region's rural and urban centres and provides connectivity to the provincial highway system.

The TMP concluded that to address the capacity needs of the Regional transportation system, a combination of measures must be initiated. This includes roadway infrastructure improvements such as road widenings, high order transit service, adequate active transportation networks, and transportation demand management strategies. The TMP has confirmed the need to widen Winston Churchill Boulevard from Highway 401 to Embleton Road to a six-lane C4 Urban Cross Section by the year 2031.

3.3.2.4 Halton-Peel Boundary Area Transportation Study, 2010

The Halton-Peel Boundary Area Transportation Study (HPBATS), initiated in March 2007 and amended in 2010, is a joint study between Peel Region, Halton Region, the City of Brampton, the Town of Caledon, and the Town of Halton Hills, with the purpose of identifying a long-term transportation network solution to serve future transportation demands based on the Growth Plan to 2031. The objectives of the study include developing an interconnected roadway network near the Halton-Peel Boundary to improve local and inter-regional traffic, identifying TDM measures and minimizing the environmental, socio-economic, and cost impacts.

The HPBATS recommendations include the widening of Winston Churchill Boulevard from two to six lanes from Highway 401 to Embleton Road by the year 2031.

3.3.3 Credit Valley Conservation Policies and Regulations

The Credit Valley Conservation (CVC) Authority regulates hazard lands including creeks, valleylands, shorelines, and wetlands under the *Conservation Authorities Act* (R.S.O. 1990, c. C.27), O. Reg. 160/06: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

CVC recognizes that certain types of interference or development related to infrastructure by their nature must be located within hazardous land, watercourses, wetlands and natural features and areas contributing to the conservation of land and associated setbacks. Considering this, CVC may permit such works where all reasonable alternatives have been explored and determined not to be feasible through an EA, comprehensive environmental study or technical report supported by CVC, and subject to the following:

i. The interference is acceptable and/or it has been demonstrated that, in the opinion of CVC, that the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected. This includes, but is not limited to:

a. all works must be constructed in such a manner as to prevent unacceptable increases in flood hazards, erosion hazards and associated effects on upstream and downstream properties. All reasonable efforts to eliminate or minimize impacts on flood hazards and erosion hazards must be implemented;

b. *the location and design of bridges and culverts must be consistent with CVC standards. Where feasible, bridge and culvert abutments or piers should be located outside of the meander belt allowance or the one hundred year erosion limit of any watercourse;*
c. *the safe passage of flood flows should not be impeded. Where feasible, structural abutments or piers should be located outside of the flood hazard to minimize obstruction to water flows;*
d. *the construction of pipe or service pipelines must maintain the predevelopment configuration of the floodplain and valleyland slopes, be below the scour depth of the watercourse and minimize disturbance to existing vegetation to the extent feasible;*
e. *outfalls must be designed to provide adequate protection to watercourse embankments and maintain or enhance existing vegetation, to the extent feasible;*
f. *provincial, regional and municipal roads should be designed to be flood free based on the flood hazard limit, to the extent feasible;*
g. *ecological linkages and corridors should be incorporated into the design of all works. The design of infrastructure should maintain, and where possible, improve or restore ecological linkages where appropriate;*
h. *the area of construction disturbance is minimized to the extent feasible;*
i. *natural features, ecological functions and hydrologic functions contributing to the conservation of land are not affected. Where unavoidable, adverse impacts must be minimized to the extent feasible and mitigation measures implemented to the satisfaction of CVC;*
j. *the interference is acceptable for the natural features and ecological functions and hydrologic functions of the wetland or watercourse; and*
k. *infrastructure should be designed so it does not:*
    i. *decrease base flow characteristics;*
    ii. *adversely impact wetlands by changing the existing hydro-period and/or hydrological connections;*
    iii. *impair surface water and groundwater quality through the introduction of pollutants such as sediments of contaminants; and*
    iv. *Prevent access for maintenance, evacuation or during an emergency.*

The Study Area has three watercourses (Levi Creek North, South and Mullet Creek) which are all located within the regulated area of the Credit River watershed.

3.4 Local Planning Policies

3.4.1 City of Brampton

3.4.1.1 City of Brampton Official Plan, 2020

The GTHA is one of the fastest growing regions in North America, and within it the City of Brampton is expected to absorb much of the forecasted growth. The *City of Brampton Official Plan* (CBOP) (2020) guides development and infrastructure decisions on issues such as land use, built form, transportation, and the environment to the year 2031. The goal of this plan is to meet current and future needs of its residents, while reflecting their collective aims and aspirations, and to preserve and maintain the prevailing quality of life in Brampton. The Draft

Official Plan for the City of Brampton (known as the “Brampton Plan”) was released April 2022 and includes policies to achieve the strategic vision for 2051 and beyond, in conformity with the RPOP (as described in Section 3.3.1.1).

Winston Churchill Boulevard is identified as a Regional Major Arterial according to Schedule B of the CBOP. These roads are to be planned, designed, constructed and designated to carry medium to high volumes of medium distance intra-regional traffic at medium speeds together with transit services through High Occupancy Vehicle (HOV) lanes, dedicated transit lanes, or other transit priority measures, and to serve traffic flows between the principal areas of traffic generation, as well as traffic to or from freeways. The arterials will be designed with a high degree of access control to the abutting properties. Arterial roads should be continuous and able to accommodate direct transit routes and transit priority measures with appropriate street furniture including sidewalks where appropriate.

Winston Churchill Boulevard is identified as a Primary Transit Corridor south of Steeles Avenue, and a Secondary Transit Corridor north of Steeles Avenue. Primary transit corridors offer high frequency service and link destinations within and external to the City. Secondary transit corridors are medium frequency corridors with less service and are found at the ends of primary corridors. The Study Area falls within the North-South Corridor Protection Area under the Bram West Secondary Plan Policies, which is an area being protected for the accommodation of a higher order transportation corridor.

3.4.1.2 Heritage Heights Secondary Plan, 2022

The Heritage Heights Secondary Plan (HHSP) (2022) comprises Chapter 52 of the City of Brampton Official Plan and was developed in collaboration with the City of Brampton, Region of Peel, CVC, key stakeholders, and affected landowners and the public. The purpose of the HHSP is to serve as a blueprint for future growth for the development of the Study Area up to 2051. The Plan contains objectives and policies related to the urban structure, natural heritage system, land use, public realm, built form, culture and heritage, mobility, sustainability, and climate resiliency, and the supporting infrastructure to support the development of “complete, active, sustainable and resilient communities”.

The lands subject to the framework border Winston Churchill Boulevard to the west. Therefore, the intended long-term growth of the Heritage Heights area will generate increased traffic toward Winston Churchill Boulevard, further justifying the need for the Study.

3.4.1.3 City of Brampton Active Transportation Master Plan, 2019

The *City of Brampton Active Transportation Master Plan* (ATMP) (2019) defines existing opportunities, an evaluation of alternative solutions, and identifies a recommended active transportation system which provides desirable pedestrian and cycling facilities. The goals of the ATMP include:

- Improving the safety of walking and cycling;

- Providing options to all residents, including enhancing the accessibility of the transportation network;
- Maximizing the value (usage) of existing infrastructure;
- Investing in network expansion; and
- Improving access to transit and providing viable active transportation options for the first and last mile.

More specifically, the mode share targets for active transportation in Brampton are as follows: 6 percent of trips by 2021; 8 percent of trips by 2031; and 10 percent of trips by 2041. The proposed MUP for both sides of Winston Churchill Boulevard will provide a connecting trail for pedestrians and cyclists and is conducive to the active transportation objectives outlined in the City of Brampton ATMP, further justifying the incorporation of the MUP in the preferred design concept.

3.4.1.4 Brampton Transportation Master Plan, 2015

The *Brampton Transportation and Transit Master Plan* (TTMP) (2015) builds upon the past transportation vision of the 2009 Brampton TTMP. The vision of the 2009 TTMP incorporates the importance of compact communities, sustainable development, protection of the natural environment, economic vitality, and healthy communities while providing safe, affordable, and efficient transportation for people and goods. The updated 2015 TTMP addresses existing transportation challenges and provides strategic solutions to facilitate the populations and employment growth expected into 2041.

The following are key objectives to support the 2015 update:

- Ensure that continuing transportation decisions and investments for an integrated transportation network can be made with confidence and with regard to current best practices for sustainable transportation and land use planning;
- Plan for a coordinated and comprehensive approach in dealing with multimodal transportation issues in Brampton; and
- Review of the strategy to optimize the role of transit and active transportation and update the transportation network needs to the year 2041.

Opportunities and constraints identified by the Plan near our Study Area include:

- Timing, function, and cost of the provision of the road network in North-West Brampton;
- Timing, location, cost, role, and classification of the North-South corridor;
- Timing and cost of the road network in Bram West Secondary Plan area;
- Existing congestion levels on area roads; and
- Impact of the future East-West Corridor.

The 2009 TTMP identified Winston Churchill Boulevard as a Major Regional Arterial expected to be widened to six lanes by 2031. There is no reference of Winston Churchill Boulevard in the current plan.

3.4.1.5 Brampton Development Design Guidelines, 2003

The Development Design Guidelines (DDG) for the City of Brampton was endorsed in 2003. The DDG provides a minimum design standard that is expected from all developers and builders in planning, designing and constructing new communities or projects in Brampton. The guidelines are focused on six features within a community including:

- Community Structure;
- Open Space System (including multi-use trail system);
- Street Network;
- Streetscapes;
- Edges and Gateways; and
- Site Planning and Built Form.

According to the DDG, Winston Churchill Boulevard is defined as a Primary Street within the Street Network which is identified as having an important role in delivering an enriched public realm. As a Primary Street, it is crucial that Winston Churchill Boulevard is capable of accommodating the growing population and providing adequate active transportation networks to enhance the experience of the public realm.

3.4.2 Town of Halton Hills

3.4.2.1 Halton Hills Official Plan, 2020

The *Town of Halton Hills Official Plan* (2020) was developed in 2008 to manage the growth challenges through the year 2021, while keeping the Town's unique character, diversity, civic identity, rural lifestyle and natural and cultural heritage. The Plan was most recently consolidated on December 31, 2020 to manage growth to the 2031 planning horizon, with the Preferred Growth Option consisting of 20,000 population growth, 370 ha of residential/mixed use area contiguous to the Georgetown Urban Area, and 340 ha of employment land contiguous to the Premier Gateway Employment Area.

The Study Area is identified as an Agricultural Area within the GTA West (Highway 413) Corridor Protection Area. The north end of the Study Area falls within the Special Policy Area 1 found in Schedule A1, Land Use Plan. Special Policy Areas apply to those lands within the Agricultural Area that are subject to a land use policy specific to a property or area. Special Policy Area 1 permits the following land uses:

- agricultural activities located on the northern and southern portions of the property;

- a place of worship and accessory assembly area including an accessory rectory/residence and administrative office;
- a private park that includes social, cultural, athletic and/or recreational activities;
- storage facilities necessarily incidental to the place of worship and private park; or
- accessory uses excluding a cemetery, a mausoleum, a crematorium, a school, a campground and any residential use other than a rectory accessory to the place of worship.

3.4.2.2 Premier Gateway Phase 2B Secondary Plan (ongoing)

In accordance with the *Planning Act*, the Town of Halton Hills is currently undertaking the Premiere Gateway Phase 2B Integrated Planning Study to accommodate employment growth to the year 2031. It is set to culminate in a Secondary Plan with land use designation and policies, scheduled to be complete in Winter 2023.

The Study Area is between Eighth Line and Winston Churchill Boulevard, north of Steeles Avenue. The Secondary Plan will contribute to the ability to attract new employment to the town and accommodate employment to the year 2031. Steeles Avenue and Winston Churchill Boulevard are currently identified as major arterial roads in the background study for the Secondary Plan. Therefore, the need to accommodate increased traffic demands as a result of additional future employment opportunities in the Halton Hills area further justifies the need for improvements Winston Churchill Boulevard.

3.4.2.3 Halton Hills Transportation Master Plan, 2011

The *Town of Halton Hills Transportation Master Plan* (2011) builds upon existing provincial, regional, and local policy framework to develop and plan strategies to address the future transportation challenges facing the Town to the year 2031. The TMP was undertaken as a Schedule B Municipal Class EA and land use planning with a goal of a transportation system that is sustainable, integrated, and encourages healthy and active lifestyles. The focus of the transportation network within the Town is on road rights-of-way, including sidewalks, on-road cycling facilities, and general travel lanes.

3.4.2.4 Town of Halton Hills Active Transportation Master Plan (2020)

The Town Halton Hills Active Transportation Master Plan (ATMP) (2020) was endorsed by Council on October 26, 2020. The ATMP included a review of policies and plans to develop one source of active transportation planning, design and implementation direction to address on and off-road active transportation. The ATMP builds off the work completed for the cycling master plan and trails strategy and outlines a plan forward to address current and future growth within the Town of Halton Hills to provide healthy and active community planning.

The ATMP outlines a system of AT facilities; considers vulnerable users to provide improved comfort and safety; provides improved integration for the overall transportation network; reflects on key destinations by trip types; addresses barriers to active transportation and

accommodates the growing population. Winston Churchill Boulevard is identified as part of the Halton Region AT Network.

3.4.3 City of Mississauga

3.4.3.1 City of Mississauga Official Plan, Office Consolidation 2021

The *City of Mississauga Official Plan* (MOP) (2021) was initiated in 2015 to manage the growth challenges through the year 2031. The plan is intended to provide a new policy framework to protect, enhance, restore and expand the Natural Heritage System, to direct growth where it will benefit the urban form, support a strong public transportation system and address the long-term sustainability of the City. The MOP also aims to align city policies with the provincial policy initiatives surrounding sustainable development that is supportive of public transit and pedestrian-based communities. The Mississauga Strategic Plan, a complementary document to the MOP, outlines the following goals:

- Developing a Transit Oriented City
- Ensuring Youth, Older Adults and New Immigrants Thrive
- Completing Our Neighborhoods
- Living Green
- Cultivating Creative and Innovative Business

Winston Churchill Boulevard is identified as an arterial road under Schedule 5 (Long Term Road Networks) of the Plan. Arterial roads are identified to move large volumes of traffic, acting as thoroughfares while also considering surrounding land uses. Arterial roads through employment areas will continue to prioritize goods movement to support the role of the transportation system towards economic health within the City. Winston Churchill Boulevard is identified as having a 35m ROW up to it's northern boundary at Highway 401. In addition, the City of Mississauga is proposing an extension of the MUP on the east side northerly from Argentia Road.

4. Problem and Opportunity

4.1 Existing and Future Traffic and Transportation Conditions

This section provides background context pertaining to the transportation system in and around the Study Area, and an assessment of existing and future conditions.

4.1.1 Approach and Methodology

A Transportation and Traffic Study (included in **Appendix A – Transportation and Traffic Study Report**) was undertaken to summarize the existing transportation system serving the Study Area for the six midblock sections and seven major intersections within the Study Area, including: Highway 401 East-North/South Off-Ramp, Meadowpine Boulevard, Orlando Access, Steeles Avenue, Maple Lodge Farms Entrance, and Embleton Road/5 Side Road. This analysis was completed for the time periods of 2014, 2021 and 2031 conditions during the weekday morning (AM) and afternoon (PM) peak hours to characterize operating conditions and identify locations which require improvements to meet the projected traffic demands for the Study Area. The methodologies applied for the midblock and intersection traffic operations analyses are described in the following sections.

4.1.1.1 Midblock Analysis

For midblock sections, the quality of service was characterized based on the volume-to-capacity (v/c) ratio for the link. The v/c ratio provides a measure of traffic volume demand to available capacity, with an at-capacity condition represented by a v/c ratio of 1.00 (i.e., volume demand equals theoretical capacity). A v/c ratio of 0.90 or less was deemed acceptable operation for midblock locations, as the Region of Peel Level of Service (LOS) Policy considers road segments with v/c ratios exceeding this threshold to be candidates for widening.

The midblock v/c ratios were calculated by dividing the existing or forecasted traffic volume by the theoretical capacity for that the section of roadway within a given time, under prevailing roadway, traffic, and control conditions. A theoretical capacity value of 900 vehicles per hour per lane was used in the analysis. This capacity is intended to account for the type and number of local roads and accesses provided, the presence of pedestrians and crossing locations, driving characteristics for this type of facility and other factors. The value of 900 vehicles per hour per lane is the capacity specified for Winston Churchill Boulevard in the Peel Transportation Demand Model.

4.1.1.2 Intersection Analysis

Intersection LOS was assigned based on average delay per vehicle and includes deceleration delay, queue move-up time, stopped delay, and final acceleration delay. LOS is a qualitative measure that describes the operating conditions within an intersection, and the perception of those conditions by road users. There are six levels of service defined. Each level has a letter identification from A to F with LOS A representing the best operating conditions and LOS F the worst. **Table 4-1** summarizes the LOS criteria for signalized intersections according to the 2000 Highway Capacity Manual (HCM 2000).

Table 4-1 Intersection Level of Service Criteria for Automobile Mode

Level of Service	Average Control Delay per Vehicle (s/veh)
	Signalized Intersections[1]
A	=< 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

4.1.2 Future Traffic and Transportation Operations

4.1.2.1 Travel Characterization, Growth and Background Developments

Based on information provided by the Region of Peel, the recommended background traffic growth rates for Winston Churchill Boulevard are 3 percent per annum for the section south of Steeles Avenue, and 4 percent per annum for sections north of Steeles Avenue. The rates are assumed to remain constant in the period from 2014 to 2021. In the period from 2021 to 2031, the sections south of Steeles Avenue are assumed to grow at a reduced rate of 2 percent per annum, in view of capacity limitations that have been identified on these sections in this time frame as traffic volumes are expected to be diverted to other routes.

Traffic volumes on the crossing roadways have been assumed to be growing at a rate of 2 percent per annum along the entire corridor for the horizon years of 2021 and 2031 except for Steeles Avenue. Steeles Avenue is assumed to grow at 2.5 percent per annum until 2021. Beyond 2021, the growth rate is assumed to be only 0.5 percent per annum due to capacity limitations identified with the proposed 6-lane cross section. Given that improvements have not been made to date, the 0.5 percent per annum growth rate for Steeles Avenue has been maintained as the existing cross section will continue to constrain future traffic growth.

4.1.2.2 Traffic Forecast

Based on these traffic growth rates, a forecast for 2021 and 2031 weekday peak hour traffic volumes was made by applying the growth rates to the base year and projected 2021 traffic volumes. The resulting future 2021 and 2031 peak hourly volumes for the intersections and midblock sections are summarized **Appendix A.** As the high northbound right-turn movement from Winston Churchill Boulevard to Steeles Avenue eastbound was found to be operating at its effective capacity, the 2014 volume for this movement was maintained for the horizon year without adding further growth. Additionally, the westbound dual left turn movement was

[1] Highway Capacity Manual, 4th Edition (HCM 2000), Transportation Research Board, Chapter 16: Signalized Intersections, Exhibit 16-2

expanded to the 2021 horizon using the assumed growth rate. Since the projected 2021 movement was found to be operating at its effective capacity, no further growth was applied for this movement beyond 2021. For the purposes of this analysis, it has been assumed that once Winston Churchill Boulevard and Steeles Avenue are widened to 6 lanes, no further widening of the through lanes will be made by 2031. As noted above, with capacity limitations in the Steeles Avenue corridor, a reduced growth rate of 0.5 percent per annum was applied to traffic volumes on Steeles Avenue for the period from 2021 to 2031.

4.1.2.3 Future Operations: Midblock Analysis

Under the existing 2014 conditions, the sections of Winston Churchill Boulevard between Steeles Avenue and Meadowpine Boulevard have reached the effective midblock lane capacity in both the southbound and northbound directions. In an AM and PM peak hour analysis, the section from Meadowpine Boulevard to the East-North/South off-ramp terminal at Highway 401 is approaching its effective capacity in both the northbound and southbound directions. The segment from Embleton Road to 2 km south of Embleton Road is also approaching capacity.

When analyzing the midblock capacity for the 2021 horizon, it was initially assumed that Winston Churchill Boulevard would be widened to a 6-lane cross section between the Highway 401 North Off-Ramp terminal and Steeles Avenue and to a 4-lane cross section from 2 km south of Embleton Road to Embleton Road. This assumption was consistent with the Region's Capital Improvement Plan at the time the traffic analysis was completed. Under these conditions, the sections of Winston Churchill Boulevard from Meadowpine Boulevard to Steeles Avenue appear to be operating within the capacity provided by a 6-lane cross section in 2021. However, the forecast traffic volume would be approaching 85 percent of the 6-lane roadway capacity by 2021. Based on this finding, the growth rate used in projecting traffic volumes to the 2031 horizon was lowered from 3 to 2 percent for the sections of Winston Churchill Boulevard south of Steeles Avenue. A higher growth rate of 4 percent provided by the Region of Peel, based on the proposed future development north of Steeles Avenue, has been maintained for the sections north of Winston Churchill Boulevard. The initial traffic analysis was conducted in 2015. Since that time no improvement has been made to Winston Churchill Boulevard. Due to the capacity limitation of just 4 traffic lanes in Winston Churchill Boulevard, the congestion in the vicinity of Steeles Avenue will have increased and growth in traffic will have decreased in line with the capacity constraint at the intersection. However, the need to widen the roadway to 6 through lanes will not have changed.

In analyzing the midblock capacity for the 2031 horizon year, the traffic analysis assumed that Winston Churchill Boulevard would be widened to a 6-lane cross section between Steeles Avenue and 2 km south of Embleton Road, in accordance with the Region's Capital Improvement Plan at the time of the traffic analysis. Based on the projected traffic volumes, widening beyond this point is not necessary. This analysis also indicates that the section from Steeles Avenue southerly to Meadowpine Boulevard will be operating at near capacity in both the AM and PM peak hours. Additionally, the sections south of Meadowpine Boulevard to the

Highway 401 South Off ramp terminal will also be approaching its effective capacity in either direction, but still within the capacity of the roadway.

Since it is unlikely that Winston Churchill Boulevard would be widened beyond 6 traffic lanes, it was concluded that beyond 2021 the effective traffic growth rate will be less than that assumed in this study to the point that the sections of Winston Churchill Boulevard will be operating at their effective capacity. This implies that some of the longer distance traffic using this corridor may choose to use alternate north – south and east – west routes to avoid the congested conditions between Steeles Avenue and Highway 401. The proposed widening of Steeles Avenue east of Winston Churchill Boulevard would offer additional capacity to traffic travelling in a general southeasterly orientation to/from the GTA.

4.1.3 Future Operations: Intersection Analysis

As part of the future operations analysis, the road improvements were analyzed based on the applied growth rates determined above for the horizon years of 2021 and 2031. The analysis focused on a 'Base' scenario for each horizon year that evaluates the operations of the road without any modifications to Winston Churchill Boulevard, but that takes into consideration planned capital road improvements on the adjacent crossing road network. A subsequent analysis was then completed with recommendations and improvements to the road network, including any road improvements planned for the road network. This scenario is referred to in the following discussion as the 'Improved' scenario for its respective horizon year.

4.1.3.1 Future 2021: Intersection Analysis

The base scenario consisted of Steeles Avenue widening to a 6-lane cross section east of Winston Churchill Boulevard. For purposes of this analysis the 6-lane cross section was extended to include 100 to 200 meters of the west approach of the intersection.

Table 4-2 shows the analysis of the Base 2021 scenario that determined whether any additional road improvements will be required to accommodate projected demand. The signal timing plans were optimized and a peak hour factor of 1.00 was applied to all movements and a 1,900 v/h/l saturation flow rate was used per Region of Peel guidelines. The table provides the LOS, v/c ratios and delays for the critical movements, as well as the overall intersection for both the AM and PM peak hours. Only movements with calculated v/c ratios in excess of 0.90 or locations with LOS E or F are included.

Table 4-2: Future 2021 'Base' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Rd / Embleton Rd	*Overall*	*D*	*37.8*	*0.96*	*C*	*24.7*	*0.70*
	EBTLR	D	50.0	1.00	--	--	--
Maple Lodge Farms Main Entrance	*Overall*	*A*	*5.5*	*0.53*	*A*	*5.9*	*0.55*
	WBL	**F**	81.1	0.67	**E**	61.0	0.50
Steeles Ave	*Overall*	***F***	*121.9*	*1.27*	***E***	*69.0*	*1.18*

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
	EBL	--	--	--	**F**	237.6	1.24
	EBT	**F**	156.4	1.24	--	--	--
	WBL	**F**	150.6	1.18	**F**	148.6	1.18
	NBL	**E**	66.9	0.61	**E**	79.5	0.93
	NBT	--	--	--	**F**	111.5	1.11
	SBL	**F**	121.0	1.09	--	--	--
	SBT	**F**	213.3	1.33	--	--	--
Orlando Access	*Overall*	*A*	*4.5*	*0.73*	*A*	*7.4*	*0.81*
	WBL	**E**	57.9	0.38	**E**	63.0	0.61
	SBL	--	--	--	**E**	68.4	0.83
Meadowpine Boulevard	*Overall*	*B*	*10.1*	*0.74*	*C*	*32.0*	*0.90*
	NBT	--	--	--	D	44.2	1.00
Highway 401 North Off Ramp	*Overall*	*C*	*35.0*	*0.81*	*C*	*26.6*	*0.84*
	NBT	C	25.5	0.94	--	--	--
	SBT	D	46.2	1.01	C	30.0	0.91
Highway 401 South Off Ramp	*Overall*	*C*	*21.4*	*0.68*	*B*	*18.1*	*0.64*

The analysis indicates that most of the movements at Steeles Avenue show operational deficiencies in both the AM and PM peak hours; particularly the southbound and northbound movements. The same is evident on the segment of Winston Churchill Boulevard south of Steeles Avenue and near the Highway 401 ramps, during the PM peak hour. The analysis also indicates that the eastbound approach to the intersection of 5 Side Road/ Embleton Road is approaching its capacity. The following improvements have been considered to address these capacity deficiencies:

Winston Churchill Boulevard:

- Widened from 4 to 6 lanes south of Steeles Avenue to Highway 401.
- Widened from 2 to 4 lanes from 2km south of 5 Side Road/ Embleton Road northerly to 5 Side Road/Embleton Road.

For the purposes of this analysis, the northbound right turns at Orlando Access and Embleton Road have been converted into shared through right turns in conjunction with the lane widening.

5 Side Road/ Embleton Road:

- Eastbound right turn lane with a 50-metre storage length.
- Westbound left turn with a 50-metre storage length.

Steeles Avenue:

- Phasing for the separate northbound right turn lane modified to include an overlap phasing with the westbound left turn movement. A separate receiving lane has also been recommended for improved operations and safety due to the large volumes of vehicles making a right turn.
- Phasing for the eastbound left turn lane provides a protected phase during the PM peak hour to operate in conjunction with the westbound left turn movement. The existing phasing plan is maintained during the AM peak hour.

Orlando Access:

- Phasing for the southbound left turn lane modified to provide an additional permitted and protected phase. This phasing would be active for both the AM and PM peak hours.

The storage lengths are assumed to remain at 50 meters for this analysis. A detailed queuing analysis will confirm the recommended storage length capacities.

4.1.3.2 *Future 2021: Intersection Improvements*

Table 4-3 shows the analysis results of the 2021 Scenario with the anticipated improvements along Winston Churchill Boulevard, along with the additional improvements at 5 Side Road / Embleton Road, Steeles Avenue and the Orlando Access as outlined above. In addition, the signal timing plans were optimized to accommodate the new lane configurations and widening.

Table 4-3: Future 2021 'Improved' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*B*	*17.3*	*0.53*	*B*	*15.8*	*0.53*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*5.8*	*0.59*	*A*	*7.0*	*0.59*
Steeles Avenue	*Overall*	***E***	*63.1*	*1.04*	*D*	*37.1*	*0.83*
	EBT	**E**	65.0	1.00	--	--	--
	WBL	**F**	102.1	1.05	--	--	--
	NBL	**F**	97.3	0.85	--	--	--
	SBL	**F**	107.6	1.04	--	--	--
	SBT	**E**	66.2	0.91	--	--	--
Orlando Access	*Overall*	*A*	*3.3*	*0.54*	*A*	*6.9*	*0.62*
Meadowpine Boulevard	*Overall*	*A*	*8.6*	*0.53*	*B*	*17.8*	*0.72*
Highway 401 North Off Ramp	*Overall*	*B*	*16.6*	*0.62*	*C*	*20.1*	*0.67*

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
Highway 401 South Off Ramp	*Overall*	*B*	*19.2*	*0.68*	*B*	*14.2*	*0.64*

The analysis indicates that the additional lanes on Winston Churchill Boulevard and turning lanes at cross streets would improve operations at intersections south of Steeles Avenue and improve the operations of 5 Side Road/ Embleton Road. Each intersection is expected to operate at overall LOS C or better with the exception of the Steeles Avenue intersection, which will still be operating at LOS E and D in the AM and PM peak hours respectively. This intersection is experiencing high volumes of traffic and further widening beyond 6 lanes is not anticipated or practical. As noted in the LRTP, additional transit improvements either in the GO system or by higher- order transit on the Argentia Road – Winston Churchill Boulevard – Steeles Avenue corridors are planned to accommodate some of the excess demand in the study area.

4.1.3.3 *Future 2031 Intersection Operations*

The recommendations and improvements resulting from the 2021 analysis (with improvements) have been carried forward in the analysis for 2031. The following additional improvements were assumed for the 2031 'Base' Scenario analysis:

2031 'Base' Scenario:

- Remainder of Steeles Avenue widened to a 6-lane cross section west of Winston Churchill Boulevard.

The analysis of the Base 2031 scenario will determine whether further improvement to Winston Churchill Boulevard is required to accommodate the traffic demand to the 2031 horizon year.

Table 4-4 shows the analysis results of the 2031 'Base' Scenario condition. The signal timing plans were optimized and a peak hour factor of 1.0 was applied to all movements as per Region of Peel guidelines, just as in the 2021 base analysis. The table provides the LOS, v/c ratios and delays for the critical movements, as well as the overall intersection for both the AM and PM peak hours. Only the movements with calculated v/c ratios in excess of 0.90 or locations with LOS E or F are bolded.

Table 4-4: Future 2031 'Base' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*B*	*19.6*	*0.65*	*B*	*18.1*	*0.66*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*8.1*	*0.80*	*B*	*10.8*	*0.81*
Steeles Avenue	*Overall*	***F***	*83.2*	*1.10*	*D*	*40.5*	*0.90*
	EBT	D	53.6	0.95	--	--	--

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
	WBL	**F**	102.1	1.05	**E**	68.0	0.97
	NBL	**F**	104.3	0.88	--	--	--
	SBL	**F**	132.1	1.12	--	--	--
	SBT	**F**	172.1	1.24	--	--	--
Orlando Access	*Overall*	*A*	*3.9*	*0.63*	*A*	*8.5*	*0.74*
Meadowpine Boulevard	*Overall*	*B*	*11.0*	*0.69*	*C*	*23.7*	*0.85*
	NBT	--	--	--	C	30.8	0.95
Highway 401 North Off Ramp	*Overall*	*B*	*18.5*	*0.74*	*C*	*23.1*	*0.80*
Highway 401 South Off Ramp	*Overall*	*C*	*22.9*	*0.81*	*B*	*15.6*	*0.75*

The analysis indicates that many of the turning movements at Steeles Avenue show operational deficiencies in the AM peak hour, including LOS F operation for both the eastbound and southbound through movements. In the AM peak hour, the westbound, northbound and southbound left turn movements will be operating at LOS F and in the PM peak hour the westbound left turn movement will be operating poorly at LOS E. The remaining intersections on the segment of Winston Churchill Boulevard south of Steeles Avenue and towards the Highway 401 ramps are functioning well with the northbound through movement at Meadowpine Boulevard approaching capacity. All intersections were found to operate at LOS C or better on an overall basis, with the exception of Steeles Avenue. This intersection was found to be operating at LOS F and v/c of 1.10 in the AM peak hour and LOS D and v/c of 0.90 in the PM peak hour.

Table 4-5: 2031 Future Conditions Midblock Capacity Analysis

Section	No. Lanes	Capacity	AM Pk Hr Volume	V/C	PM Pk Hr Volume	V/C
Embleton Rd to 2 km South of Embleton Road (Maple Lodge Farms Entrance)	2	1800	1444	0.80	1453	0.81
Maple Lodge Farms Entrance to Steeles Ave	2	1800	2047	1.14	2170	1.21

4.1.3.4 Future 2031 Analysis: With Improvements

Table 4-6 shows the analysis results of the 2031 Scenario with the lane widening improvements scheduled along Winston Churchill Boulevard as outlined above except for

lane widening from 4 to 6-lanes 2 km south of Embleton Road to Embleton Road. In addition, the signal timing plans were optimized to better allocate the signal timing and the additional lane widening. **Figure 4-1** shows the recommended lane configurations for the 2031 scenario with improvements.

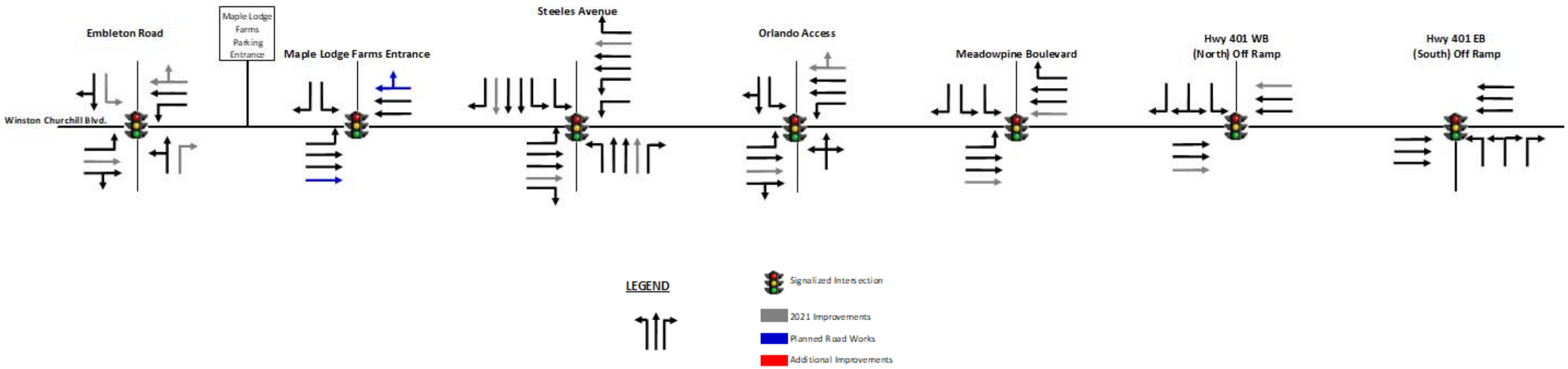


Figure 4-1: Recommended Lane Configuration for the 2031 Scenario with Improvements

Table 4-6: Future 2031 'Improved' Scenario Intersection Analysis Results

Intersection	Movement	AM Peak Hour			PM Peak Hour		
		LOS	Delay(s)	V/C	LOS	Delay(s)	V/C
5 Side Road/ Embleton Road	*Overall*	*C*	*20.3*	*0.65*	*B*	*18.3*	*0.66*
Maple Lodge Farms Main Entrance	*Overall*	*A*	*5.6*	*0.57*	*A*	*6.7*	*0.58*
Steeles Avenue	*Overall*	***E***	*63.1*	*1.04*	*D*	*40.5*	*0.90*
	EBT	**E**	64.3	1.00	--	--	--
	WBL	**F**	114.7	1.08	**E**	68.0	0.97
	NBL	**F**	104.3	0.88	--	--	--
	SBL	**E**	62.5	0.90	--	--	--
	SBT	**E**	70.4	0.97	--	--	--
Orlando Access	*Overall*	*A*	*4.2*	*0.65*	*A*	*8.5*	*0.74*
Meadowpine Boulevard	*Overall*	*B*	*10.4*	*0.64*	*C*	*22.7*	*0.81*
Highway 401 North Off Ramp	*Overall*	*B*	*18.5*	*0.74*	*C*	*23.1*	*0.80*
Highway 401 South Off Ramp	*Overall*	*C*	*22.9*	*0.81*	*B*	*15.6*	*0.75*

The analysis results indicate that the intersection of Steeles Avenue continues to experience high delays for some turning movements however it was concluded that no additional signal modifications can improve the operations of these movements. Any further road modifications to Winston Churchill Boulevard and Steeles Avenue are constrained by the right-of-way (ROW) limitations at each of the approaches to this intersection. It is expected that during peak hours of operation this intersection will approach and reach capacity due to the high volume of traffic on both the through and turning movements. Overall, Steeles Avenue will operate at an acceptable LOS D in the PM peak hour and LOS E in the AM peak hour. The remaining intersections operate at LOS C or better.

This analysis does not account for planned transit improvements that will affect traffic demand on the Winston Churchill Boulevard and Steeles Avenue corridors. It is anticipated that with these improvements, operations in the Winston Churchill Boulevard corridor will be at or near capacity at the major intersections, particularly those in the section from Steeles Avenue to Highway 401.

It is noted that a widening of Winston Churchill Boulevard to 6 lanes near 5 Side Road / Embleton Road is not necessary by 2031 from an intersection analysis perspective and a capacity analysis perspective. Widening the roadway from Steeles Avenue to Maple Lodge Farms (i.e., 2km south of 5 Side Road / Embleton Road) is required. It is recommended however, that the widening to 6 lanes be continued to 5 Side Road / Embleton Road and transitioned to a 4-lane cross section north of this intersection to maintain cross section

continuity and improve safety. Coordination with Halton Region will be required at the detailed design stage to ensure that the widening of Winston Churchill Boulevard south of 5 Side Road/Embleton Road is transitioned into any improvements planned by Halton/Peel Regions north of this intersection.

It is also noted that the proposed GTA West (Highway 413) and interchange is proposed to be located just south of Embleton Road and that a consistent 6-lane cross section will be needed to accommodate movements to/from ramps connecting with Winston Churchill Boulevard. These requirements will need to be examined further during detailed design when the location and requirements for the proposed ramps and interchange with the highway are known.

4.2 Problem and Opportunity Statement

Winston Churchill Boulevard currently operates at acceptable levels of service, safety, and operations. However, the forecasted growth for the Region of Peel suggests that Winston Churchill Boulevard will experience congestion, safety, and operational issues if no improvements are implemented by 2031.

An opportunity exists to improve Winston Churchill Boulevard to accommodate future traffic demand, including active transportation facilities. Improvements will be assessed using several factors including the ability to minimize the impacts to the natural, social, and cultural environments.

5. Identification and Evaluation of Alternative Solutions

5.1 Alternative Solutions

Forecasted growth in the Region of Peel will result in congestion, safety, and operational problems along Winston Churchill Boulevard between Highway 401 and Embleton Road and improvements to accommodate this growth are necessary. Phase 2 of the EA process includes the evaluation of alternative solutions to address the forecasted growth. The project team identified four Alternative solutions, which were evaluated as part of the Study, and are outlined in **Table 5-1**.

Table 5-1: Planning Alternative Solutions

Planning Alternative Solutions		Description
Alternative 1	Do Nothing	Maintain the existing configuration of Winston Churchill Boulevard with no improvements other than regular maintenance. This alternative is used as a baseline comparison for other alternatives.
Alternative 2	Transportation Demand Management/ System Management (TDM/TSM)	Developed to encourage and support alternative transportation behaviours to reduce peak travel demand.
Alternative 3	Widen/Improve Winston Churchill Boulevard	Widen and improve Winston Churchill Boulevard from Highway 401 to Embleton Road to increase capacity and reduce congestion along this corridor.
Alternative 4	Widen Other Roads or Construct New Roads	Improve adjacent parallel roads or construct new connecting roads to accommodate the projected future traffic conditions along Winston Churchill Boulevard.

5.2 Evaluation Criteria

The Alternative Solutions are evaluated to identify the preferred solution that addresses the problem statement, while minimizing overall impacts to the environment. The Alternative Solutions were evaluated against a set of Evaluation Criteria established by the Project Team in conjunction with input received from the Region of Peel, Halton Region, the public and regulatory agencies. The criteria used to evaluate the four alternative solutions are summarized in **Table 5-2**.

Table 5-2: Evaluation Criteria

Category	Criteria
Natural Heritage / Hydrology	• Natural heritage resources • Fisheries and aquatic resources • Vegetation • Surface water • Groundwater • Geotechnical • Fluvial geomorphology
Socio-Cultural / Socio-Economic Environment	• Communities, recreational facilities, land uses • Noise/vibration • Air quality and aesthetics • Property impacts • Access to residential areas • Indigenous interests • Archaeological resources • Built heritage and cultural heritage resources
Land Use Planning	• Consistency with Provincial, Regional and Municipal Policies • Accommodate planned development and growth • Impacts on business properties • Access to businesses and key employment areas
Transportation	• Public transit • Safety for all modes of transport • Increase mode of travel options • Reduced congestion and delays • Pedestrian and cycling friendly environment • Meets transportation planning objectives • Applicable design standards

Category	Criteria
Engineering	• Accommodates SWM and drainage needs • Minimizes utility relocation • Minimizes constructability complexity • Minimizes disruption due to construction
Capital Cost	• Construction value • Property costs / requirements • Operating Costs • Maintenance costs • Property Requirements

The evaluation of Alternative Solutions was based on an assessment of potential impacts, and review of input received from the public, stakeholders, regulatory agencies and Indigenous communities, and regulatory agencies. The evaluation examined each criterion against the Alternative Solutions and whether the impact was preferred or not preferred. The results of this evaluation are presented in **Table 5-3**.

5.2.1 Alternative Solution No. 1 – Do Nothing

The "Do Nothing" Alternative would result in no measures to improve the forecasted deficiencies to Winston Churchill Boulevard by 2021. It would remain at its current configuration. This alternative was used as a baseline for comparison with other alternatives.

The "Do Nothing" Alternative is preferred from the perspective of the natural environment, as there is no impact. From the perspective of cultural and social environment, it's not preferred as the option provides no opportunity for improved active transportation connectivity for pedestrians and cyclists. The Alternative does not improve the aesthetics of the road and it will continue to deteriorate with increased traffic and congestion. From a land-use and transportation perspective this option is not preferred, as it does not align with the provincial, regional and municipal policies nor meet the requirements of the Official Plan and TMP designation for the identified road right-of-way for the industrial connector road character. In addition, it does not provide for improved transportation connectivity. The costs associated with maintenance will continue to increase as the congestion increases.

5.2.2 Alternative Solution No. 2 – Transportation Demand Management

The Transportation Demand Management/System Management (TDM/TSM) Alternative includes changing travel demand, reducing traffic volumes (by encouraging active transportation), and encouraging use of other modes of travel.

The TDM Alternative is preferred from a natural heritage and social environment perspective. There is minimum impact to the natural environment, as this alternative will not require a significant expansion to the existing right-of-way. This alternative will have a reduced impact from a social perspective, it will provide for improved active transportation (in an attempt to get more people to consider alternative forms of transportation which will reduce the amount of congestion on Winston Churchill, however not to as great of an extent as widening Winston Churchill Boulevard). This alternative has a moderate preference relative to cultural, land use and cost factors. From a cultural perspective, this alternative is moderately preferred, given that adding bus/high occupancy vehicle lanes, or multi-use paths or sidewalks will change the cultural aspect of the roadway. This alternative moderately meets the goals of the Official Plan, related to reducing car dependency. Alternative 2 does not fully address transportation needs along the corridor.

5.2.3 Alternative Solution No. 3 – Widen/Improve Winston Churchill Boulevard

Alternative Solution 3 involves the widening of Winston Churchill Boulevard to accommodate additional lanes, cycling lanes, sidewalks, and safety improvements.

Alternative Solution 3 is moderately preferred from a natural heritage perspective as this alternative will involve widening outside of the existing right-of-way which may impact the surrounding natural heritage. This alternative is preferred based on the social environment, land use and transportation. The alternative is preferred based on the social environment through improvement to the recreational facilities, including multi-use paths to provide improved connectivity for active transportation. This alternative has the opportunity to improve mobility, safety and to meet the required design standards identified by the municipalities. However, as noted in the traffic needs assessment, widening of the roadway should be supported by other measures to reduce traffic volumes to accommodate projected growth. These measures would include transportation demand management to reduce peak volumes, improved transit service and access, and improved active transportation throughout the corridor to offer greater modal choice.

5.2.4 Alternative Solution No. 4 – Widen Other Roads/Construct New Roads

Alternative Solution 4 results in reducing the number of vehicles using Winston Churchill Boulevard, as well as improving congestion. It also results in minimal impact to the natural environment, similar to the Do Nothing alternative.

Alternative Solution 4 involves the widening of other parallel roads or the construction of new roads. This alternative is not preferred from any of the identified criteria. Other studies have shown that even with improvements to other transportation facilities paralleling Winston Churchill Boulevard, additional capacity is required to accommodate forecast travel demand along the corridor. In addition. this alternative will not encourage other modes of travel, and reduce air quality and noise, and result in no improvements for active transportation. This alternative is not sustainable as it will contribute to increased greenhouse gas (GHG)

emissions, and result in no support for transit service improvements. In addition, it will have unqualifiable impacts to the natural environment.

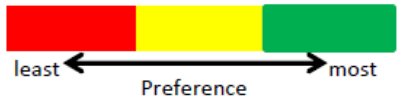
5.3 Selection of Preferred Solution

Based on the evaluation of alternative solutions, Alternative 2 (TDM) and Alternative 3 (Widening/Improving Winston Churchill Boulevard) were carried forward. TDM has no impacts on the natural environment, encourages the use of alternative transportation methods, but by itself does not fully address the transportation needs along the corridor. Widening of Winston Churchill Boulevard has the potential to impact the natural and cultural environment; however, it improves the social environment and addresses the transportation needs along the corridor.

In addition, this finding is consistent with the provincial, regional and municipal policies and meets the requirements of the RPOP and TMP designation for the identified road right-of-way for the industrial connector road character.

Table 5-3: Summary of Alternative Solutions

	Alternative 1 Do Nothing	**Alternative 2** Transportation Demand Management	**Alternative 3** Widen/Improve Winston Churchill Blvd	**Alternative 4** Widen other roads/ construct new
Natural Heritage				
Cultural				
Social Environment				
Land Use				
Transportation				
Costs				
Recommendation	**NOT CARRIED FORWARD** • No impact on the natural environment • Does not address the transportation needs along the corridor	**CARRIED FORWARD** • No impact on the natural environment • Encourages use of non-auto travel • Does not fully address transportation needs along the corridor	**CARRIED FORWARD** • Potential to impact natural, cultural environment • Improves social environment including recreational facilities and aesthetics through landscaping • Addresses transportation needs along the corridor	**NOT CARRIED FORWARD** • Greatest impact on natural, cultural and social environment • Not consistent with land use planning policy • Does not address transportation needs along corridor



6. Existing Conditions

An array of technical baseline studies were undertaken to document the existing conditions of the Study Area and assess the impacts of the Project. Hatch conducted a desktop review to confirm the findings of the technical studies where applicable. The following section describes the existing conditions of the Natural Environment (Section 6.1), the Socio-Cultural Environment (Section 6.3), Transportation (Section 6.4), and Engineering (Section 6.5).

6.1 Land Use

6.1.1 Existing Land Use Designation

The Study Area falls within the “Agricultural Lands” of Halton Hills as indicated by the Halton Hills Official Plan, Schedule A1. The north end of the Study Area falls within the Special Policy Area 1 found in the Schedule A1 Land Use Plan. Special Policy Areas apply to those lands within an Agricultural Area that are subject to a land use policy specific to a property or area. Special Policy Area 1 permits the following land uses:

- Agricultural activities located on the northern and southern portions of the property;
- A place of worship and accessory assembly area including an accessory rectory/residence and administrative office;
- A private park that includes social, cultural, athletic and/or recreational activities;
- Storage facilities necessarily incidental to the place of worship and private park; and
- Accessory uses excluding a cemetery, a mausoleum, a crematorium, a school, a campground and any residential use other than a rectory accessory to the place of worship.

The Study Area which intersects with the City of Brampton falls within a primarily “Industrial” area with a small section on the north end being categorized as “Residential” as indicated by The City of Brampton’s Official Plan (Schedule A). Additionally, the Study Area falls within the “Corridor Protection Area” of Brampton. This is an area being protected for the accommodation of a higher order transportation corridor.

6.2 Natural Environment

A Natural Environment Report was undertaken by Beacon and is included in **Appendix B**.

6.2.1 Terrestrial Vegetation

The Study Area is located in a rural area characterized namely by agricultural land (categorized as row crop and hay/pasture) and existing residential / commercial developments (i.e., road allowance, residential housing, businesses). Considering a large portion of the Study Area has been previously impacted, the vegetation communities within the area are primarily located along the watercourses. No nationally or provincially rare, threatened or endangered plant species were recorded in the Study Area.

Beacon Environmental Limited (Beacon) prepared a vegetation inventory of the Study Area on June 9, 2016 in accordance with the Ecological Land Classification (ELC) system for southern Ontario (Lee et al, 1998). Beacon delineated the vegetation communities within the Study Area and recorded dominant vegetation types within these communities. The terrestrial vegetation communities identified with the Study Area include:

- **ELC Unit 1: Existing ROW** area consisting of the existing road and ROW that is associated with it. This includes the paved roadway, the gravel road edges and the grassed ditches.
- **ELC Unit 2: Existing Residential/Commercial Development** consisting of the various residences and businesses that are located within / adjacent to the Study Area and the manicured lots that are associated with them.
- **ELC Unit 3: Agricultural Fields** that are located within / adjacent to the Study Area have been divided into two categories: those planted in row crops at the time of the survey and those planted in hay or were pasture land for livestock. This distinction was made to assist with the SAR habitat assessment. This land use will vary from year to year based on the crop rotation for each field.
- **ELC Unit 4: Dry-Moist Old Field Meadow (CUM1-1)** consisting of typical old field meadow species such Tall Goldenrod (*Solidago canadensis var. scabra*), Smooth Brome Grass (*Bromus inermis*), Tufted Vetch (*Vicia craca*), Creeping Thistle (*Cirsium arvense*), and asters (*Syphyotrichum spp*.).
- **ELC Unit 5: Mineral Cultural Thicket (CUT1)** is dominated by Common Buckthorn (*Rhamus cathartica*) and apple (*Malus sp*.).
- **ELC Unit 6: Fresh-Moist Lowland Deciduous Forest (FOD7)** consisting of White Elm (*Ulmus americana*), Manitoba Maple (*Acer negundo*), Trembling Aspen (*Populus tremuloides*), and Freeman's Maple (*Acer x freemanii*). The understory is comprised of Common Buckthorn and Tartarian Honeysuckle (*Lonicera tatarica*). The Ground covers that are observable from the roadside include Tall Goldenrod and Day Lily (*Hemerocaulis fulva*).
- **ELC Unit 7: Mineral Meadow Marsh (MAM2)** located along Mullet Creek dominated by Spearmint (*Mentha spicata*), in association with Soft-stem Bulrush (*Schoeoplectus tabernamontanii*), Spikerush (*Elyocharis erythropoda*), and Panicled Aster (*Symphyotrichum lanceolatum*).
- **ELC Unit 8: Mineral Shallow Marsh (MAS2)** located at the north end of the Study Area that is dominated by Narrow-leaved Cattail (*Typha angustifolia*), Common Reed (*Phragmites australis*), Broad-leaved Cattail (*Typha latifolia*), and Reed Canary Grass (*Phalaris arundinacea*).

- **ELC Unit 9: Shallow Aquatic / Open Water Aquatic (OAO)** feature that is a dug pond, located at the north end of the Study Area.

6.2.2 Wildlife

A desktop screening for potential Species at Risk (SAR), SAR habitat, significant wildlife habitat or other potential wildlife habitat was completed using a combination of online databases, including:

- Natural Heritage Information Centre (NHIC) database (available online at: https://www.ontario.ca/page/natural-heritage-information-centre);
- eBird: a citizen-based bird observation network in the biological sciences. Biological Conservation 142: 2282-2292 (available online at: https://ebird.org/home);
- Ontario Breeding Bird Atlas (OBBA) (available online at: https://www.birdsontario.org)
- iNaturalist, Global Biodiversity Information Facility (available online at: https://www.inaturalist.org);
- Ontario Reptile and Amphibians Atlas (available online at: https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/)

Additionally, Beacon conducted a total of three (3) breeding bird surveys on May 30, 2014, June 14, 2015, and June 27, 2015 to confirm the findings of the desktop study. The road allowance adjacent to the potentially suitable bird habitat was walked to identify any bird species within the grassland and hayfield communities adjacent to the road.

A total of 34 species of birds were recorded within or adjacent the study area, 29 of which were breeding. The most numerous species included Barn Swallow (*Hirundo rustica*), Red-winged Blackbird (*Agelaius phoeniceus*), Savannah Sparrow (*Passerculus sandwichensis*), European Starling (*Sturnus vulgaris*), and American Robin (*Turdus migratorius*). Species that were observed foraging within or flying over the study area included Red-tailed Hawk (*Buteo jamaicensis*), Great Blue Heron (*Ardea herodias*), Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), Chimney Swift (*Chaetura pelagica*), Canada Goose (*Branta canadensis*), and Ring-billed Gull (*Larus delawarensis*). Bird species that are listed as Endangered, Threatened or Special Concern are identified below in Section 6.2.3.

The field investigations conducted by Beacon identified the following suitable bird habitat:

- All of the Barn Swallow observations within the Study Area consisted of birds foraging over the area or perching on hydro lines adjacent the road ROW.
- Bobolinks commonly live in hayfield and often nest on the ground in dense grasses. The nesting foraging locations of Bobolink were observed during the first two breeding bird surveys were in some of the hay fields along the highway corridor.

- Four Chimney Swift were observed foraging over open fields within / adjacent to the Study Area during the third survey; however, the location was not included as part of its general habitat description and is therefore not regulated under the *Endangered Species Act*.
- Savannah Sparrow were observed breeding / foraging in and along the edge of the agricultural fields within / adjacent to the Study Area.
- One White-breasted Nuthatch was observed in a treed area adjacent the Study Area during the second survey.

6.2.3 Species at Risk

There are various agricultural fields that are located in and adjacent to the Study Area. They have been split into two categories, those that were planted in row crops at the time of the survey and those that were planted in hay or were pasture land for livestock. This distinction was made to assist with the SAR habitat assessment.

Desktop studies were completed to identify potentially suitable habitat for SAR within the Study Area. The field surveys of the Study Area (described in Section 6.2.2) determined the presence of suitable habitat for SAR as described in **Table 6-1**. Notably, the tributaries of Levi Creek that flow through the Study Area are upstream of regulated Redside Dace habitat. Additionally, Bobolink and Bark Swallow were observed during field investigations. Potential Bobolink were observed breeding within the agricultural fields (hay/pasture) located adjacent to the roadway. Barn Swallow were observed foraging over the Study Area and perching on hydro lines adjacent to the ROW, and nesting habitat was observed on nearby buildings visible from the ROW.

Work should be minimized within the watercourse channels to reduce impacts to Redside Dace habitat. Additional surveys may be required prior to construction to confirm the presence of suitable Bobolink habitat.

Table 6-1: Potential Species at Risk Habitat

Common Name	Scientific Name	SARA	COSEWIC	SARO	Suitable Habitat	Potential Presence Ranking	Habitat Presence within the Study Area
Butternut	*Juglans cinerea*	END	END	END	Commonly found in small groups within deciduous forests. Prefers moist, well-drained soil and is often found along streams.	Unlikely	Suitable habitat may be present within the wooded areas within the Study Area.
Redside Dace	*Clinostomus elongatus*	END	END	END	Found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. Generally found in areas with overhanging grasses and shrubs, and during spawning season they can be found in the shallow parts of streams.	Confirmed	Supporting habitat may be present within the tributaries of Levi Creek.
Barn Swallow	*Hirundo rustica*	SC	SC	THR	Often live in close proximity to humans and human-made structures (i.e., open barns, bridges, and in culverts).	Confirmed	Nesting on nearby building visible from the ROW.
Bobolink	*Dolichonyx oryzivoru*	SC	THR	THR	Commonly found in hayfields and nesting on the ground in dense grasses.	Confirmed	Suitable habitat present within the hay/pasture fields.
Chimney Swift	*Chaetura pelagica*	THR	THR	THR	Mainly nests in hollow trees or tree cavities in old growth forests. Can be found in and around urban	Potential	N/A

Common Name	Scientific Name	SARA	COSEWIC	SARO	Suitable Habitat	Potential Presence Ranking	Habitat Presence within the Study Area
					settlements nesting and roosting in chimneys and other human-made structures.		
Eastern Meadowlark	Sturnella *magna*	THR	THR	THR	Primarily breed in moderately tall grasslands (i.e., pasture and hayfields) and other croplands, roadsides, shrubby fields, and open areas. Small trees, shrubs or fence posted used as song perches.	Unlikely	Suitable habitat may be present within the hay/pasture fields.
Monarch Butterfly	*Danaus plexippus*	END	SC	SC	Larvae feed on milkweed plants and are confined to meadows and open areas. Adult butterflies can be found in more diverse habitats where nectar-bearing flowers are present.	Unlikely	Suitable habitat with small amounts of milkweed present near the Cultural Meadow communities.
Snapping Turtle	*Chelydra serpentina*	SC	SC	SC	During nesting season (early to mid-summer) females can be found along gravelly or sandy areas along streams. Suitable nesting habitat may also be found near roads (especially gravel shoulders), dams and aggregate pits.	Unlikely	Suitable habitat may be present within watercourses, and potential nesting habitat along the shoulder of the current roadway.

6.2.4 *Watercourses and Aquatic Habitat*

The Study Area is located at the headwaters of two sub watersheds, Levi Creek and Mullet Creek, in which there are three warmwater watercourses including: Levi North, Levi South and Mullet Creek. The remainder of the crossings within the Study Area are ephemeral (i.e., only contain water during the spring runoff/snowmelt).

The *Credit Valley Conservation Management Plan* (2002), has characterized upper Levi Creek as warm/cool water thermal regime as a direct result of the presence of several on-line ponds and extensive surrounding agricultural activity. Levi Creek tributaries convey flow through agricultural and residential areas. In general, tributaries of Levi Creek are highly disturbed. The CVC Management Plan, also identified Mullet Creek as a warm/cool water thermal regime with generalist fish species. Mullet Creek is part of sub-watershed 4 within the CVC watershed. Mullet Creek travels under Winston Churchill Boulevard from west to east. These watercourses have been heavily impacted from agriculture activity.

Levi Creek Wetland Complex is a Provincially Significant Wetland (PSW) situated along three tributaries of Levi Creek. The wetlands within this complex are noted for their wetland diversity, species richness and the abundance of seepage-fed wetlands that provide some base flow to Levi Creek (2007). The MNRF (Aurora District) identified Levi Creek Wetland Complex within the vicinity of the study corridor.

Beacon has identified Levi Creek North and Mullet Creek as providing potential landscape linkage functions including supporting wildlife movement through the existing agricultural matrix. However, the creek corridors are generally very narrow and heavily influenced by adjacent farming; therefore, it is expected that these creeks would only support movement of small mammals and reptiles such as snakes.

Beacon undertook an aquatic habitat assessment to determine the quality and function of the fish habitat described above in the three tributaries. The following sections described the finding of this assessment.

6.2.4.1 *Mullet Creek*

Mullet Creek originates approximately 2.7 km northwest of Culvert 10 that conveys it beneath Winston Churchill Boulevard. The riparian on both sides of this portion of the channel is made up of manicured lawn and was largely concealed with grasses and Cattail species which act as a barrier to fish movement. At the time of the survey, no water was observed within the culvert, which was lined with rip rap, which also acts as a barrier to fish movement. Land use adjacent to the channel is residential and agricultural.

Flowing water was observed downstream of the culvert which is assumed to have originated from the storm sewer outfall located immediately northeast of the culvert. The morphology of the stream is flat with an isolated pool located immediately downstream of the culvert outlet. This pool had a wetted width of about 1.1 m and a depth of approximately 0.18 m. Instream algae and overhanging grasses provided minimum shade. Pool substrate was a combination

of silt, sand, gravel and some cobble material, with a cluster of cobbles isolating the pool from the remainder of the channel, acting as a seasonal barrier to fish passage. The channel then meanders naturally through a deciduous forest with a wetted width of about 0.23 m and a depth of about 0.10 m. Stream substrate through this reach includes gravel, silt and cobble. Land use adjacent to the channel is industrial and agricultural.

Figure 6-1 shows the location of Culvert 10.

Figure 6-1: Culvert 10 Location – Mullet Creek

Drainage Feature 1 and 2: Located just north of Maple Lodge Farms

At the time of the survey, Drainage Features 1 and 2 were completely dry and were characterized as vegetated swales, comprised mainly of grasses and cattails. Rip rap was present at the culvert outlets. The riparian area was made up of manicured lawn east of Winston Churchill Boulevard. Land use includes industrial (east of Winston Churchill Boulevard) and agricultural (west of Winston Churchill Boulevard). The only contribution to fish habitat is likely limited to flow conveyance during periods of high flow.

6.2.4.2 Levi Creek South

Levi Creek South originates about 1.8 km northwest of Culvert 8. At the time of the investigation the upstream reach of the channel contained no water and was entirely choked with vegetation including: Cattail (*Typha sp.*), Wild Mint (*Mentha arvensis*) and Crown Vetch (*Coronilla varia*). This channel becomes highly disturbed immediately beyond the ROW as the channel travels through an active pasture.

At the time of the survey, the downstream reach of the channel was concealed with instream cattails with minimal water that was approximately 0.04 m deep. The channel was undefined with a riparian area that consisted of grasses and herbaceous vegetation with some low-lying shrubs. The culvert was lined with rip rap with no water present. It is assumed that this

system conveys flows after the spring freshet and large rainfall events that contribute indirectly to downstream fish habitat.

Figure 6-2 shows the location of Culvert 8.

Figure 6-2: Culvert 8 Location – Levi Creek South

Drainage Features 3 & 4: Located north of Levi Creek South

East of Winston Churchill, these dry features are characterized as agricultural swales which had recently been ploughed and planted with soy beans. Land use west of Winston Churchill Boulevard is farm pasture at Drainage Feature 3 and residential with manicured lawns at Drainage Feature 4. The only contribution to fish habitat is likely limited to flow conveyance during periods of high flow.

Drainage Feature 5: Located just south of Levi Creek North

At the time of the survey, this channel was undefined and dry. The culvert outlets into a drainage ditch that likely receives runoff from surrounding residential and agricultural areas. This drainage ditch connects to an agricultural swale which has been recently ploughed through and planted with corn. This system likely conveys flows after the spring freshet and large rainfall events to downstream fish habitat.

6.2.4.3 Levi Creek North

At the time of the survey, the watercourse was identified as a vegetated swale situated between an agricultural field to the south and a meadow community to the north. The channel was completely dry in the downstream reach. West of Winston Churchill Boulevard, the channel was completely concealed with grasses and herbaceous vegetation with minimal

water of about 4 cm. The substrate inside Culvert 3 was covered in rip rap with minimal standing water. Due to the direct connection of Levi Creek Wetland Complex, this system was identified as intermittent system which may support fish habitat.

Figure 6-3 shows the location of Culvert 3.

Figure 6-3: Culvert 3 Location – Levi Creek North

Drainage Feature 6: Located north of Levi Creek North

At the time of the survey, this channel was dry and lined with grasses and Goldenrod species (*Solidago sp*). Rip rap was present at the base of the culvert outlet continuing past the ROW fence. Land use surrounding the channel is agricultural. The swale is situated within a meadow community. The culvert outlet contained an isolated pool covered in algae. The culvert was gated, which acts as a barrier to fish passage. No defined channel was identified upstream of Winston Churchill Boulevard. Land use in this area was also agricultural. This system likely conveys flows after the spring freshet and large rainfall events and contributes indirectly to downstream fish habitat.

6.2.5 Fish Community

No fish were observed in the tributaries during Beacon's aquatic habitat assessment, however, correspondence with MNRF indicated that Mullet Creek and Levi Creek North provide habitat for a warmwater fish community within the Study Area. In addition, the MNRF indicated that Levi Creek (North and South) is considered contributing habitat for Redside Dace (*Clinostomus elongatus*), a species listed as endangered under COSEWIC and SARO (as described in Section 6.2.3).

CVC fish sampling results identified Brook Stickleback *(Culaea inconstans*) as the only fish species captured within the tributary of Mullet Creek and Levi Creek North. Brook Sticklebacks are habitat generalists and are tolerant of some disturbance.

6.2.6 Significant Natural Features

The City of Brampton Official Plan (2020) and the Halton Hills Official Plan (2020) indicate that no Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW), or Environmentally Significant/Sensitive Areas are located within the Study Area. The desktop study confirmed these findings. There is a unit of the Levi Creek Wetland Complex situated along three tributaries of Levi Creek which is identified as a PSW; however, it is not expected to be impacted by the Study aside from potential sedimentation during construction. There are no other mapped natural heritage features (or areas) within the Study Area based on a review of the following MNRF databases:

- Lands Information Ontario (LIO);
- Natural Heritage Information Centre (NHIC); and
- Natural heritage Areas mapping (e.g., ANSIs, PSWs, and Environmentally Significant Areas).

6.3 Cultural Heritage

6.3.1 Archaeological Assessment

In 2014, a Stage 1 Archaeological Assessment (Stage 1 AA) was carried out by Archaeological Research Associates Ltd. (ARA), provided in **Appendix C**. The objectives of the investigation included identifying any archaeological sites, or areas of archaeological potential in the study area, and providing strategies to mitigate project impacts on these areas. The assessment concluded that the Study Area has the potential for both Pre-Contact and Euro-Canadian archaeological sites due to the presence of two primary water sources, three historically-surveyed roadways, two historic areas of settlement, and four municipal-registered properties. The Study Area also consists of a considerable amount of area with no archaeological potential due to disturbed lands and land conditions not suitable for archaeological potential. The Stage 1 AA was submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) on July 14, 2015 and entered into the Ontario Public Register on July 24, 2015.

Stage 2 Archaeological Assessment - Mount Zion Cemetery

In 2017, a Stage 2 Archaeological Assessment (Stage 2 AA) was undertaken for Mount Zion Cemetery by ARA to review alternatives to reduce the impact on residential properties on the west side of Winston Churchill Boulevard, and investigate further opportunities to shift the road farther to the east, adjacent to the Mount Zion Cemetery. The Stage 2 AA is included in **Appendix C** and was completed specifically for Mount Zion Cemetery located along the eastern limits of Winston Churchill Boulevard (study area shown in **Figure 6-4**). The previous

Archaeological Assessment identified that the Cemetery had archaeological potential. One location containing archaeological materials was identified adjacent to the project limits, which will not be directly impacted by construction. The investigation did not identify any burial features (within the subject property) however, an additional investigation is required to confirm these preliminary findings.

The Stage 2 AA was submitted to the MHSTCI on July 26, 2019 and entered into the Ontario Public Register on March 19, 2020.

A partial Stage 3 Archaeological Assessment is planned during detailed design to determine whether any areas of cultural heritage value and interest will require a Stage 4 excavation.

Figure 6-4: Stage 2 Archaeological Assessment Study Area[2]

6.3.2 Built Heritage and Cultural Heritage Landscapes

A Cultural Heritage Assessment Report (CHAR) was prepared by ARA and is included in **Appendix D**. The Report documented Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) within the Study Area. Three BHRs and eight CHLs were identified within

[2] Hatch, 2019. *Stage 2 Archaeological Assessment, Mount Zion Cemetery Investigation*. Municipal Class Environmental Assessment. Township of Chinguacousy, Peel County, Ontario.

the Study Area, as summarized in **Table 6-2**. There is potential for direct impacts to six properties. Five resources exhibit low risk due to their proximity to the roadway.

It is recommended that the construction activities avoid using BHRs and CHLs for layout and that consideration should be given to alternative designs that avoid the properties with high risk to be impacted by road widening activities. A Heritage Impact Assessment should be conducted prior to any direct impacts on the identified heritage attributes of the BHRs and CHLs.

The CHAR was submitted to the MHSTCI on May 25, 2016. Comments were received in 2016, and a follow-up CHAR was resubmitted to the MHSTCI on October 18, 2022, including a summary of the responses to address the comments.

Table 6-2: Summary of Built and Cultural Heritage Resources

Resource ID	Location	Land Use and Recognition	Criteria Met	Potential Impacts
BHR 1	8531 Winston Churchill Boulevard	Residence - Identified During Field Survey	Design or Physical Value and Contextual Value	Low Risk
BHR 2	Hyatt Farmhouse	Residence - Listed by Municipality	Design or Physical Value, Historical or Associative and Contextual Value	Low Risk
BHR 3	9021 Winston Churchill Boulevard.	Residence - Identified During Field Survey	Design or Physical Value	Loss or Displacement
CHL 1	Mount Zion Cemetery	Listed by Municipality	Design or Physical Value, Historical or Associative and Contextual Value	Loss or Displacement
CHL 2	Maple Lodge Farms Complex	Agricultural adapted to industrial - Identified During Field Survey	Historical or Associative and Contextual Value	Loss or Displacement
CHL 3	Melody Acres Training Stable	Agricultural - Identified During Field Survey	Historical or Associative and Contextual Value	Low Risk
CHL 4	Humphrey Farm	Agricultural - Listed by Municipality	Design or Physical Value, Historical or Associative and Contextual Value	Loss or Displacement
CHL 5	8768 Winston Churchill Boulevard	Agricultural - Identified During Field Survey	Design or Physical Value and Contextual Value	Loss or Displacement
CHL 6	8836 Winston Churchill Boulevard	Agricultural - Identified During Field Survey	Historical or Associative and Contextual Value	Low Risk
CHL 7	Croatian Franciscan Social and Cultural Centre	Agricultural, Religious - Listed by Municipality	Design or Physical Value, Historical or Associative and Contextual Value	Loss or Displacement
CHL 8	9065 Winston Churchill Boulevard.	Agricultural - Identified During Field Survey	Historical or Associative and Contextual Value	Loss or Displacement

6.4 Existing Transportation Network

6.4.1 Adjacent Transportation Projects

In addition to the planning documents and studies discussed in Section 3, the following transportation studies in the general vicinity of the Study Area were reviewed to determine the potential impact to this study:

- GTA West (Highway 413) Project;
- Highway 401 Widening Project; and
- 407 ETR Structure.

6.4.2 Existing Roadway Network

Winston Churchill Boulevard is a boundary road that divides the Region of Peel to the east and Halton Region to the west. In accordance with the LRTP (summarized in Section 3.3.1.2), Winston Churchill Boulevard is a Major Road, with the section from Highway 401 to Embleton Road / 5th Side Road having a 45 m ROW and the section north of Embleton Road having a 36 m ROW. The road passes through primarily agricultural and industrial areas, with commercial and residential occurring just south of the Study Area. There are seven signalized intersections within the Study Area.

From the north ramp at Highway 401 to the entrance at Maple Lodge Farms it consists of a 4-lane arterial roadway with additional turning lanes at key intersections. Just north of the Maple Lodge Farms access, Winston Churchill Boulevard narrows to a 2-lane cross section with a single traffic lane in each direction and a two-way left turn lane. This continues to Embleton Road where additional turning lanes are provided at the signalized intersection. **Figure 6-5** presents the existing cross-sections within the Study Area.

Figure 6-5: Existing Cross-Sections of Winston Churchill Boulevard Study Area

6.4.3 Existing Traffic Conditions

A Transportation and Traffic Study was undertaken by Hatch to identify existing transportation system serving the Study Area. Winston Churchill Boulevard has six midblock sections and

seven major intersections, including: Embleton Road/5 Side Road, Maple Lodge Farms Entrance, Steeles Avenue, Orlando Access, Meadowpine Boulevard, Highway 401 East-North/South Off-Ramp terminal (refer to **Appendix A**).

6.4.4 Existing Transit and Active Transportation Network

Mississauga Transit (also known as MiWay) and Brampton Transit (also known as ZUM) operate on Winston Churchill Boulevard. Both offer transit options to the Lisgar GO Station (GO Transit's Milton line) in Mississauga.

MiWay includes a bus from Meadowvale Town Centre northerly on Winston Churchill Boulevard, along Meadowpine Boulevard and connecting back into Meadowvale Town Centre via Argentia Road. ZUM operates along Steeles Avenue, with a stop at Winston Churchill Boulevard, and then travels southerly to Argentia Road connecting in with the Lisgar GO Station.

Additional recommendations identified by the Peel Active Transportation Plan for future active transportation facilities within and around the Study Area, include:

- A Multi-Use Path (MUP) has been recommended along the east side of Winston Churchill Boulevard from Highway 401 northerly; along Meadowpine Boulevard; and on the south side of Steeles Avenue.
- A sidewalk on both sides of Embleton Road from Winston Churchill eastwards as well as a proposed bicycle lane;
- A sidewalk on one side of Steeles Avenue from Winston Churchill Boulevard eastwards which will transition into a sidewalk on both sides before reaching Heritage Road; and
- Two Class I off-street pathways bordered by Embleton Road to the North, Winston Churchill Boulevard to the West, Highway 407 to the South, and Heritage Road to the East.

6.5 Engineering Components

6.5.1 Existing Stormwater Management and Structural / Non-Structural Culverts

A Drainage and Stormwater Management (SWM) study was conducted 2016 and updated in 2021 to include appropriate recommendations for the current drainage and SWM features for the current preferred design (refer to **Appendix E – Stormwater Management and Drainage**).

There are three structural culverts that cross the Study Area. The culvert to the south provides passage for Mullet Creek, and the two culverts just north of Maple Lodge Farms provide passage for Levi Creek South and Levi Creek North. There are seven additional culverts which provide surface water movement under Winston Churchill Boulevard. There are two Oil and Grit Separators (OGS) units associated with Mullet Creek, located south of Maple Lodge Farms, and one OGS unit located just north of Maple Lodge Farms. The OGS

units remove sediment, debris and hydrocarbons (oil and grease) from stormwater. The OSG units are designed so that high flows from infrequent rainfall events do not result in the re-suspension of contaminants into the separator and the discharge of the contaminants into the receiving environment.

The three structural culverts are described below:

- Mullet Creek: 10.363m x 2.44m concrete;
- Levi Creek South: 5.49m x 2.44m concrete; and
- Levi Creek North: 10.973m x 2.44m concrete

All three culverts are open footed culverts. There are seven non-structural culverts within the Study Area as outlined in **Table 6-3**.

Table 6-3: Existing Non-Structural Culverts

Culvert Identifier	Station	Material	Barrels (-)	Length (m)	Span (m)	Rise (m)
C2	3+680	Concrete	1	23.69	1.2	1.2
C4	3+340	Concrete	1	23.24	0.6	0.6
C5	3+156	Concrete	1	20	0.6	0.6
C6	2+945	Concrete	1	20.16	0.6	0.6
C7	2+796	Concrete	1	20	0.6	0.6
C9	2+347	Concrete	1	24.2	0.6	0.6
C11	1+075	Concrete	1	35	0.6	0.6

6.5.2 Fluvial Geomorphic Survey

A fluvial geomorphology survey was conducted by Water's Edge in 2015 (refer to **Appendix F – Fluvial Geomorphology Report**).

The purpose of the Survey was to examine general geomorphic characteristics, creek stability, channel flows, and determination of the local meander belt widths. The report documents the three watercourse crossings including:

- Site 1: This crossing is at Levi Creek North. It is the northernmost of the three;
- Site 2: This crossing is at Levi Creek South. It is located approximately one kilometer south of Site 1; and
- Site 3: This crossing is at Mullet Creek and is the southernmost crossing of the three.

The creek stability was assessed using two methods. The first method used was a Rapid Geomorphic Assessment (RGA) and the second method used was a Rapid Stream Assessment Technique (RSAT). The results of the assessments can be found in **Table 6-4**.

Table 6-4: RGA and RSAT Scores

Site	RGA	RSAT
1	0.03	19.5
2	0.01	16
3	0.05	13

The bankfull flows for each watercourse were determined using data from the geomorphic field work and using an assumed 'n' methodology. The meander Beltwidth for the three watercourse crossing sites are summarized in **Table 6-5**.

Table 6-5: Summary of Meander Beltwidth

Site	Watercourse	Beltwidth (m)	Bankfull Width (m)	Factor of Safety (m)	Final Meander Beltwidth (m)	Meander Beltwidth Regime Equations (m)	Final Beltwidth (m)
1	Levi Creek	4.42	0.89	0.53	5.84	4	5.84
2		3.74	1.37	0.51	6	6	6
3	Mullet Creek	5.92	1.94	0.79	9	9	9

The conclusions of the assessment are as follows:

- The surveyed reaches have different geomorphic characteristics;
- The RSAT scores show that all three creeks are currently in 'Poor' condition although the RGA scores determined that all the channels are relatively stable;
- Levi Creek North, Levi Creek South, and Mullet Creek bank flows are 0.04 m^3/s, 0.06 m^3/s and 0.06 m^3/s, respectively; and,
- The final beltwidth for Levi Creek North, Levi Creek South and Mullet Creek are 5.84 m, 6 m and 9 m respectively.

The following recommendations made by Water's Edge should be considered during channel modification:

- Proposed channel dimensions should closely resemble existing geomorphic parameters;
- Proper pool/riffle sequences should be laid with pools generally on the outside bend of a meander and riffles through the transitions;

- Stone sizing should take into account the existing substrate of each reach;
- The channel at Levi Creek North will require realignment due to proximity to existing roadway;
- Channel realignment should properly observe the final meander beltwidths; and
- Low flow channels should be made through culverts using stone to form the banks.

6.5.3 Geotechnical

A geotechnical investigation was carried out in 2015 by Thurber Engineering Ltd. ("Thurber") to evaluate the existing pavement and subsurface conditions of the Study Area and provide pavement/geotechnical recommendations (refer to **Appendix G - Geotechnical Investigation Report**).

The Study Area is in the physiographic region known as the Peel Plain, which is characterized by beveled till plains. The soil conditions consist mainly of red to brown glacial tills ranging in composition from gritty to clayey silt till (Halton Till). The bedrock in the area is comprised of Upper-Ordovician red shale of the Queenston Formation, and the depth to the formation is approximately 4 m to 15 m below the ground surface. Due to recent construction and agricultural activities, it is likely that anthropogenic (fill) deposits have been placed in some areas. Based on existing borehole logs, the subsurface soil in the upper 5 m below ground surface predominantly consists of fill and/or topsoil overlying very stiff to hard silty clay to clayey silt till.

The field investigation was comprised of deflection testing, visual pavement condition survey, pavement coring, borehole drilling, and laboratory testing on recovered samples of granular base/subbase and subgrade soil. Based on the visual pavement condition survey which was reconstructed in 2013, the pavement surface within the Study Area was in excellent condition with no significant distresses observed in traveled lanes. The only noted distress was the slight segregation along longitudinal construction joints.

The asphalt thickness of lanes and paved shoulders within the Study Area typically varied from 170 to 220 mm. Although, an asphalt thickness of 100 mm was observed on the northbound right turn lane 200 m south of the Steeles Ave. intersection.

Underlying the asphalt surface, the pavement structure is comprised of granular base/subbase, which consisted primarily of sandy gravel with trace silt over sand with some gravel and silt. The granular base/subbase thickness typically varied from 700 to 900 mm. However, thicknesses varying from 580 to 1,630 mm were observed. During the drilling of the boreholes the interface of between the granular base and granular subbase could not always be distinguished. A grain size analysis was completed, and it was found that granular material collected near the asphalt generally conforms to OPSS Granular A gradation specifications. Samples taken at lower depths were found to be slightly finer than OPSS Granular B, Type I gradation requirements.

The soils beneath the Winston Churchill Blvd. pavement structure were generally found to be fill material which varied from sandy silt with clay, to silt with sand with clay. All boreholes were dry upon completion of drilling with no indication of groundwater within the drilling depth. The natural moisture content of the subgrade soils was found to be typically between 10 and 20 percent.

The subgrade soil conditions below the pavement subgrade, and outside of existing pavement areas, were identified based on previous borehole information. The subgrade soils in existing pavement areas typically consist of silty clay to clayey silt till, with some zones of silt and sand till, and occasional sand and gravel layers. Shale bedrock was also found in some boreholes below Elevation 200 m. The subgrade soils outside of existing pavement areas are generally overlain by topsoil or rip rap at the existing culvert locations.

Recommendations provided by Thurber include:

- In all pavement widening areas, the new pavement thickness should match or exceed the thickness of existing pavement so that positive sub-surface drainage is maintained across the widening area. The average thickness of the existing asphalt pavement is 195 mm. The average thickness of the granular base and sub-base is 800 mm (150 mm Granular A; and 650 mm Granular B assumed on average);
- As future pavement condition cannot be predicted at this time, it is recommended that the existing pavement be retained with the contract to include an item for asphalt base repairs to be completed prior to the placement of the asphalt overlay;
- Reinstatement of existing driveways and access roads should match existing conditions; and
- New pavement structures should be constructed to provide cross lateral drainage at the top of subgrade as well as at the pavement surface.

Other recommendations include recommended pavement surface for the bridge deck and approach slabs, recommended pavement surface for the multi-use path, culvert extensions, and foundation design.

6.5.3.1 Pavement Design

As part of the geotechnical investigation, a pavement investigation was carried out in 2015 which included deflection testing, visual pavement condition survey, pavement coring, borehole drilling, and laboratory testing. The visual pavement condition survey assessed the conditions of the existing pavement surface. Since the pavement surface in the Study Area was reconstructed in 2013, it was observed to be in excellent condition, with no significant distress observed in either direction and a positive ride condition rating. The only distress observed was slight segregation / ravelling along longitudinal construction joints.

Based on the existing pavement structure and traffic volume, an analysis was completed to determine the remaining life of the current pavement and determine the structural capacity of

the new pavement constructed in 2013. The accumulated Equivalent Single Axle Loads (ESALS) were determined to be the anticipated construction year of 2031 for the respective sections. At the time of this study (2015), the remaining life on the sections are as follows:

- Highway 401 to Steeles Avenue: 13 years remaining
- Steeles Avenue to Maple Lodge Farms: 15 years remaining
- Maple Lodge Farms to Embleton Road: 20 years remaining

A rehabilitation strategy was recommended for the segment from Highway 401 to Steeles Avenue, as well as the segment from Steeles Avenue to Embleton Road.

6.5.4 Hydrogeological

A hydrogeological investigation was undertaken by Thurber in 2016 (refer to **Appendix H - Hydrogeology Investigation Report**). The purpose of this study was to assess the groundwater conditions and potential water well or aquifer impacts related to future construction along Winston Churchill Boulevard.

The Study Area is located within the Credit Valley Watershed, managed by CVC. Three 2nd order streams are located within the Study Area. Concrete culverts facilitate the flow of these larger watercourses below Winston Churchill Boulevard. Surface water drainage generally flows eastward from a drainage divide located about 1.5 km west of Winston Churchill Boulevard.

Groundwater depth data was collected from piezometers, monitoring wells and open boreholes installed during the various geotechnical investigations. The groundwater readings observed generally varied from 1.8 m to 3.3 m below the road surface except near the 407ETR where the road is constructed on an embankment and is at higher elevation than the surrounding area.

On June 15, 2016 groundwater samples were collected and analyzed for selected parameters included in the Ontario Provincial Water Quality Objectives (PWQO). The groundwater samples were submitted unfiltered to AGAT Laboratories for testing. It was found that the unfiltered monitoring well water sample contained a high amount of suspended solids. The concentration of nutrients and metals are commonly associated with the presence of suspended solids. Of the filtered metal parameters tested, only the concentration of dissolved Boron exceeded the PWQO criteria of 0.2 mg/L. It is expected that most dewatering activities associated with construction of the proposed widening will be above the shale where lower levels of boron are expected. Recommendations provided by Thurber include:

- Dewatering rates are not expected to be greater than 50,000 L/day and therefore would not require a permit to take water;
- Groundwater will require treatment prior to direct discharge into surface water;

- Control of impacts must be put in place to mitigate the potential for the dewatering activities to impact the environment; and
- A well monitoring program for the private wells identified along Winston Churchill Boulevard should consist of measuring the groundwater level and testing groundwater quality at each well.

6.5.5 *Contaminated Soil*

A Contamination Soil Assessment Report was conducted in 2015 by Thurber (refer to **Appendix I – Contamination Report**). The purpose of this report was to evaluate the presence of existing or potential concerns near the project ROW that may have resulted from previous and/or current land uses or geologic conditions. The potential for contaminated properties to impact a project of this nature is expected to occur in the following ways:

- The acquisition of contaminated property required to increase the ROW of the Winston Churchill Boulevard corridor;
- Spills or incidents along the existing ROW; and/or
- Migration of contaminants into the existing ROW from adjacent properties. Since the subsurface soil conditions consist of mainly glacial tills, contaminant mobility through native soils is expected to be low. However, contaminants may potentially migrate along preferential pathways such as localized sand or silt deposits or buried utility trenches.

The following Site Locations are High, Medium or Low potential Areas of Potential Environmental Concerns (APEC) and their locations are outlined in **Table 6-6**.

Table 6-6: Area of Potential Environmental Concern

APEC NO.	Site Location	APEC Category	Rational for APEC
1	Highway 401 near Winston Churchill Boulevard	Moderate	Previous spills, close proximity to right-of-way (<50 m), spills likely isolated to Highway 401 grade level
2	Cellular Tower at Highway 401 Interchange	Low	Electrical components, no record of previous spills, close proximity to right-of-way (< 50 m)
3	Hydro Corridor and adjacent construction site	Moderate	Use of machinery for maintenance and construction, excavation works, potential for spills, close proximity to right-of-way (<50 m)
4	7886 Winston Churchill Boulevard – Industrial yard	Moderate	Transport truck storage on site, former application for asphalt plant, potential for spills, moderate proximity to

APEC NO.	Site Location	APEC Category	Rational for APEC
			right-of-way (50 – 150 m)
5	7940 Winston Churchill Boulevard – Industrial yard	Moderate	Transport truck and equipment storage on site, potential for spills, close proximity to right-of-way (<50 m)
6	7954 Winston Churchill Boulevard – Self storage facility	Low	Vehicle and trailer storage at property, potential for spills, not in close proximity to right-of-way (150 – 250 m)
7	7825 Winston Churchill Boulevard – Emblem Logistics warehouse	Moderate	Warehouse with multiple loading bays for transport trucks, potential for spills, loading bays are moderate proximity to right-of-way (50 – 150 m)
8	7995 Winston Churchill Boulevard – Amazon Fulfillment warehouse	Moderate	Warehouse with multiple loading bays for transport trucks, potential for spills, loading bays are moderate proximity to right-of-way (50 – 150 m)
9	Winston Churchill Boulevard and Steeles Avenue intersection	High	Previous spills and pipeline strikes, previous Ecolog ERIS reports, adjacent to former gas station, within right-of-way
10	16863 Steeles Avenue – Wood furniture manufacturer	Low	Manufacturing and possible material storage on site, not in close proximity to right-of-way (150 – 250 m)
11	16917 Steeles Avenue –Contractor and trucking company	Moderate	Construction equipment and vehicle storage on site, possible vehicle service garage, generator of approved wastes, moderate proximity to right-of-way (50 – 150 m)
12	2982 Steeles Avenue – Former gas station	High	Fuel USTs, possible vehicle service garage, potential for spills, close proximity to right-of-way (<50 m)
13	8175 Winston Churchill Boulevard – Sign manufacturing	High	Metal fabrication, metal and vehicle storage, potential for spills, generator of approved wastes, previous Ecolog ERIS reports, close proximity to right-of-way (<50 m)
14	8301 Winston Churchill Boulevard – Meat processing facility	High	Large factory, fuel USTs, previous spills, generator of approved wastes, previous

APEC NO.	Site Location	APEC Category	Rational for APEC
			Ecolog ERIS reports, close proximity to right-of-way (<50 m)
15	8564 Winston Churchill Boulevard – Garden centre	Moderate	Vehicle and equipment use, possible stockpiled soil, potential fertilizer and pesticide use, potential for spills, moderate proximity to right-of-way (50 – 150 m)
16	8597 Winston Churchill Boulevard – Landscaping company	Moderate	Small excavation equipment use, pesticide operator, possible stockpiled soil, potential for spills, close proximity to right-of-way (<50 m)
17	8656 Winston Churchill Boulevard – Farm	Moderate	Vehicle and equipment use, potential for spills, moderate proximity to right-of-way (50 – 150 m)
18	8768 Winston Churchill Boulevard – Farm	Moderate	Vehicle and equipment use, potential for spills, moderate proximity to right-of-way (50 – 150 m)

Where the project requires acquiring properties at the APEC locations list in **Table 6-6**, Thurber recommends that further study in the form of a Phase I Environmental Site Assessment (Phase I ESA) be conducted at the relevant properties to be acquired. Consideration may also be given to conducting limited Phase II soil and groundwater testing in portions of the APEC properties to be acquired. If upon further investigation soil contamination within the Study Area is found, it must be disposed of consistent with Part XV.1 of the *Environmental Protection Act* (R.S.O. 1990, c. E.19) and O. Reg. 153/04, Records of Site Condition, which details the requirements related to site assessment and cleanup.

Based on visual observations of the site, the land use is primarily agriculture, except for industrial portions between the 407ETR and Steeles Avenue, and on the east side of Winston Churchill Boulevard at the Maple Lodge Farms facility. Additionally, there is a small commercial area located at the northeast corner of Winston Churchill Boulevard and Steeles Avenue, at the site of a former gas station.

6.5.6 Foundation Investigation

A Foundation Investigation and Design Report was completed by Thurber (refer to **Appendix J – Foundations Report**). The purpose of this investigation was to assess the geotechnical conditions at the project site and to provide geotechnical recommendations for design and construction of the bridge expansion of the 407ETR.

The field investigation was carried out between April 25 and May 20, 2016 and consisted of a total of five boreholes. Four boreholes advanced from the top of the existing approach embankments of the Winston Churchill Boulevard bridge and one borehole advanced from the exiting median of the 407ETR.

The results of the field investigation and laboratory tests indicate that the subsurface conditions generally consist of asphalt and embankment fill overlying silty clay till, which overlies gravelly sand underlain by shale bedrock. Pockets/layers of intra-till sand and silt were encountered within the silty clay till.

Based on the geotechnical conditions in the Study Area, feasible foundation solutions for the proposed widening of the Winston Churchill Boulevard bridge over the 407ETR include:

- Steel piles driven to the very dense gravelly sand or the shale bedrock;
- Spread footings resting on the native very stiff to hard silty clay till; and
- Augured caissons extending into the shale bedrock.

For consistency purposes and to minimize future differential movement between the existing bridge and its expansion, steel driven piles are considered the most suitable foundation type for the bridge expansion/widening.

6.5.7 Air Quality

An Air Quality Assessment was undertaken by Novus Environmental in 2015 based on 2011-2015 historical meteorological data from Toronto Pearson Airport (refer to **Appendix K – Air Quality Assessment).**

The purpose of the assessment is to document existing air quality conditions and assess the potential impacts associated with the Project. The study also assessed the total GHG emissions associated with the project. Contaminants of interest for transportation assessment in Ontario are determined by MTO and MOECC. The following containment guidelines were used:

- MOECC Ambient Air Quality Criteria (AAQC) ;
- Health Canada/Environment Canada National Ambient Air Quality Objectives (NAAQOs); and
- Canadian Council of Ministers of the Environment (CCME) Canada Wide Standards (CWSs).

Thirty-five sensitive receptors were modelled to represent worst-case impacts within the Study Area, and were placed at residential locations along the roadway. Ambient monitoring data showed that all combined concentrations of contaminants were below their respective guidelines, except for PM_{10} (Coarse Particulate Matter) and TSP (Total Suspended Particulate Matter) which exceed the MOECC guidelines. Additionally, while the 24-hour

benzene concentration was below MOECC guidelines, the annual benzene concentration exceeded the guideline due to ambient concentrations.

The results of the GHG emission assessment showed that due to increases in traffic volumes and decreases in future emission rates, total GHG emissions will be reduced in almost all sections of the Study Area. The Study indicates that the section between Steeles Avenue and Maple Lodge Farms is predicted to have an increase in GHG emissions due to increases in traffic volumes in this particular section, however, the same volume of traffic passing through the existing configuration with higher congestion rates would likely worsen the GHG emissions throughout all sections of the Study Area. A large portion of roadway particulate matter emissions comes from dust on the pavement which is re-suspended by vehicles travelling on the roadway.

6.5.8 Noise Assessment

A Noise Assessment was undertaken in 2016 (refer to **Appendix L – Noise Impact Assessment**). The purpose of the Assessment was to document the existing noise conditions, as well as the future noise impacts resulting from the Project.

The study was carried out in accordance with the Region of Peel General Guidelines for the Preparation of Acoustical Reports (2012), with noise control criteria and limits outlined by the City of Brampton taking precedence. Noise regulations related to road work in the City of Brampton are outlined the Noise Attenuation Wall Policy Amendment – retrofit Policy and Road Widening.

The Assessment was carried out in accordance with the City of Brampton, and then compared against the Region of Peel General Guidelines for the Preparation of Acoustical Reports (Region of Peel, 2012).

It was determined that the expansion of Winston Churchill Boulevard is expected to produce a marginal increase in ambient noise from traffic of less than 3 dB[5], remaining below the daytime limit required by the MECP and City of Brampton. No noise mitigations are recommended.

6.5.9 Access

There are a number of residential driveways providing access to Winston Churchill Boulevard from existing residences/farmland on both the east and west sides of the corridor (north of Steeles Avenue). There are a number commercial properties providing access to Winston Churchill Boulevard along the corridor from Highway 401 northerly to Steeles Avenue, as well as north of Steeles Avenue to the east up to Maple Lodge Farms.

As part of the Bram West Parkway Secondary Plan, there are three new intersections proposed along the corridor. The Premier Gateway Phase 2B Secondary Plan is currently ongoing and is expected to include a new connection to Winston Churchill Boulevard.

6.5.10 *Illumination*

Street lighting exists on both sides of the road providing aerial lighting on hydro poles from the southern limits up to Meadowpine Boulevard. North of Meadowpine Boulevard to Steeles Avenue, illumination is provided via individual poles staggered between the east and west sides of the roadway. North of Steeles Avenue, illumination is staggered, with luminaires on the east side on hydro poles, and illumination poles on the west side up until just north of Maple Lodge Farms. Illumination does not exist north of Maple Lodge Farms.

6.5.11 *Servicing and Facilities*

Utility providers were contacted as part of the consultation process to confirm the presence of utilities within the Study Area. A summary of the utilities confirmed as being present are summarized below.

Alectra Utilities / Brampton Hydro

- Alectra utilities has existing overhead plant on the west side of Winston Churchill Blvd from Steeles Avenue to Embleton Road that may conflict with work.
- Alectra has proposed underground plant in the northeast quadrant of Steeles and Winston Churchill Blvd, as part of Steeles Avenue widening between Winston Churchill Blvd and Mississauga Road, being undertaken by Region of Peel.
- Alectra has existing poles between Highway 401 westbound off-ramp and Meadowpine Boulevard that may conflict with proposed widening.
- Alectra inquired as to whether proposed trench locations may compromise existing utilities or proposed locations of hydro poles.
- Hydro One advised that there is a Hydro One high voltage transmission facility within the Study Area.
- Hydro One requested the Region to provide the preferred design concept to be able to provide comments, if modifications are required to infrastructure.
- Structure foundations to be maintained at all times, with no disturbance of earth around poles, guy wires and tower footings, and no work to occur close to structures.
- Hydro One confirmed there is no Hydro One Transmission (above 115 kV) in the Study Area.

Halton Hills Hydro

- Halton Hills Hydro advised they take the lead for poles south of Steeles Avenue and Brampton Hydro takes the lead north of Steeles Avenue up to Embleton Road.
- There is a substation in the southwest corner of Steeles Avenue/WCB that cannot be moved.

- Inquiries about street lightening – planned to be on hydro poles.
- Based on design speed of 80km/h, there is a 4m clearance requirement from edge of curb and additional 3m clearance behind pole for working easement.
- Hydro also expressed concerned about grade differentials (i.e., watercourse crossings), which may affect minimum span requirements.

Acronym Solutions Inc (formerly Hydro One Telecom)

Acronym Solutions has fiber optic cable along the path of the environmental study. The fiber cable is all aerial on Hydro poles. It is likely that the cable would be impacted if the Hydro poles need to be relocated. Along Steles Avenue the fiber is on the north side of the road. Along Winston Churchill Boulevard the fiber is on the east side of the road from Steeles Avenue to 8301 Winston Churchill Blvd (~1 km north of Steeles).

TransCanada Pipeline

- Two high pressure natural gas pipelines cross Winston Churchill Boulevard south of the 407ETR. The following are TransCanada and National Energy Board requirements for construction or development in close proximity to pipeline to be followed:

Municipal Infrastructure

- Region of Peel (water) advised of a watermain located along the west side of Winston Churchill Blvd which extends the entire length of the road.

7. Consultation / Engagement

7.1.1 Overview of Consultation Requirements

The Code of Practice for consultation in Ontario's Class EA process outlines the MECP's expectations for appropriate consultation.

7.1.2 Summary of Consultation Milestones

Indigenous engagement and public and stakeholder consultation is an essential component to the Class EA process. A Consultation Plan was prepared during the start of the Study to achieve the following objectives:

- Identify potentially affected stakeholders;
- Provide information to stakeholders regarding the Study;
- Obtain input from stakeholders throughout Study; and
- Integrate information received into the planning and decision-making process.

The consultation milestones for the Study have been separated into the four phases of the Class EA process, as summarized below.

The following sections further describe these milestones within each phase of consultation. Refer to **Appendix M - Consultation** to review all of the comments and feedback associated with each of these phases of consultation.

7.1.3 Phase 1

The following milestones are covered under Phase 1 of the consultation process:

Table 7-1: Summary of Phase 1 Consultation Activities

Phase 1 Consultation Activities	Date
Preparation of a Master Contact List (including relevant stakeholders, agencies, residents and Indigenous communities)	November 17 – November 27, 2014
Publish the Notice of Study Commencement	November 17 – November 27, 2014
Initial agency kick-off meeting	November 17, 2014
Meeting held with the MNRF and CVC	May 12, 2015
Technical Agency Committee (TAC) #1	August 27, 2015

7.1.3.1 Summary of Phase 1 Consultation

Using municipal property ownership information, a list of stakeholders/property owners within the Study Area was compiled. A letter was provided, as well as a copy of the Notice of Commencement, and a comment sheet to all those on the Project Contact List. The purpose of the mail out was to solicit initial comments and interests, as well as confirm their interest to remain on the Project Contact list for future project notifications.

A Notice of Commencement was placed in the Brampton Guardian on November 19 and 26, 2014, and the Georgetown Independent & Free Press on November 20 and 27, 2014. The Notice of Commencement outlined the purpose of the Study, as well as the opportunity to provide comments, and invited participation in the Study. Contact information to the Region's Project Manager was included in the Notice. The Notice, as mentioned above was provided to all those along the study area corridor.

The consultation activities coordinated during Phase 1 included:

- Project Website: The project website went live on November 17, 2014.
  - https://www.peelregion.ca/pw/transportation/construction/environmental-assessment/winston-churchill-boulevard.asp
- Notice of Study Commencement Advertisements were published in:
  - Brampton Guardian on November 19 and November 26, 2014; and
  - Georgetown Independent & Free Press on November 20 and November 27, 2014

The primary concern of residents is the recent completion of construction and having the potential to go through the experience again in such a short time period. Most of the residents expressed an interest in the process, as well as the EA outcome and requested to remain on the Project contact list. Regulatory agencies contacted by letter on November 17, 2014 are included in Table 7-2.

Table 7-2: Review Agencies and Other Contacts

Federal Agencies
Transport Canada (Ontario Region)
Environment Canada (Ontario Region)
Canadian Transport Agency
Trans Canada Pipeline
Fisheries and Oceans Canada
Canadian Environmental Protection Agency
Ministry of Indigenous Affairs and Northern Development Canada
Provincial Agencies
Health Canada, Ontario Region
Ministry of Indigenous Affairs
Ministry of the Environment
Ministry of Natural Resources and Forestry
Ministry of Agriculture, Food and Rural Affairs
Ministry of Heritage, Sport, Tourism and Culture Industries
Ministry of Municipal Affairs and Housing
Ministry of Public Infrastructure and Renewal
Ministry of Transportation
407 ETR Project Team
Ontario Provincial Police

Infrastructure Ontario
GO Transit
Ducks Unlimited
Municipal Agencies
Conservation Halton
Credit Valley Conservation Authority
City of Brampton
Town of Halton Hills
Regional Municipality of Halton
Regional Municipality of Peel
City of Mississauga

Copies of newspaper advertisements, letters to stakeholders and agencies and the tracking table are contained in **Appendix M.**

Following Study Commencement, the Project Team identified a number of agencies to be included as part of the TAC consisting of those agencies and stakeholders who would be consulted regularly in advance of each Public Information Centre (PIC), to receive technical comments and guidance related to the Study. A preliminary meeting was held with the MNRF and CVC on May 12, 2015.

The first TAC meeting was held on August 27, 2015. There were 17 attendees representing the Region of Peel, Town of Halton Hills, Halton Region, CVC, Halton Hills Hydro, City of Mississauga, and City of Brampton.

7.1.4 Phase 2

The following milestones are covered under Phase 2 of the consultation process:

Table 7-3: Summary of Phase 2 Consultation Activities

Phase 1 Consultation Activities	Date
Notice of PIC #1 is published	October 8 and October 15, 2015
PIC #1	October 22, 2015
Meeting held with the NDMNRF and CVC	August 9, 2016
Meeting held with the 407 ETR Project Team and MTO	September 15, 2016
TAC #2	October 4, 2016

7.1.4.1 Summary of Phase 2 Consultation

The Notice of PIC #1 (provided in **Appendix M**) was posted in the Brampton Guardian Newspaper and the Georgetown Independent & Free Press on Thursday, October 8 and 15, 2015. A notice and letter were mailed out to approximately 52 property and business owners, as well as Indigenous Communities and review agencies on October 8, 2015. The notice was also posted on the Peel Region website.

PIC #1 was held on October 22, 2015 to present and receive public input on the need and justification, the existing conditions, the assessment of alternative solutions, and the

identification of the preliminary preferred solution. The PIC provided the opportunity to meet with members of the project team and provide information with respect to future planned EA activities. The PIC was held at the Norval Queen of Peace, Croatian Franciscan Centre (CFC), located at 9118 Winston Churchill Boulevard in Norval. The purpose of the PIC was to introduce the Study to interested stakeholders and potentially affected property holders.

The PIC was held in the form of a drop-in centre. Individuals were invited to drop in between the hours of 6:00 pm and 8:00 pm to view the display boards that presented information about the Study, and to speak one-on-one with the Project team members, including representatives from the Region of Peel, Halton Region, and Hatch. The presentation materials used for PIC #1 are included in **Appendix M**.

Comment Sheets were provided for attendees to provide feedback on the information provided at the PIC and the Study to date.

A total of 23 people attended the Open House which included the public and stakeholders. Generally, people were concerned about timing of the project, timing or property requirements and timing of construction and property impacts. Attendees were interested in other projects in the area including Financial Drive, GTA West (Highway 413), and the Halton-Peel Boundary Study. Comments also included concerns related to traffic congestion during construction, impact to businesses, pedestrian safety and access to Maple Lodge Farms during and following construction.

A secondary meeting was held with the MNRF and CVC on August 9, 2016, as well as a meeting with the 407 ETR Project Team and MTO on September 15, 2016.

TAC #2 was held on October 4, 2016 in preparation for PIC #2. The purpose of this meeting was to discuss the progress of the work, including reviewing the findings, improvement alternatives and to receive input. The project team outlined the evaluation of the alternative design concepts. There were 23 people in attendance at the meeting.

7.1.5 Phase 3

The following milestones are covered under Phase 3 of the consultation process:

Table 7-4: Summary of Phase 3 Consultation Activities

Phase 1 Consultation Activities	Date
Meeting held between the Halton Region and the Region of Peel to discuss the cemetery	November 21, 2016
Meeting held between the Halton Region, the Region of Peel and the City of Brampton regarding cemetery encroachment	January 16, 2017
Conference call held with the Halton Region	November 27, 2017
Meeting held with the Halton Region, the Region of Peel and ARA	December 5, 2017
Meeting held with City of Brampton and Halton Region to provide an update on the Project	June 1, 2020
Meeting held with CVC to discuss Draft SWM Report and comments	July 28, 2021
TAC #3	September 14, 2021

Phase 1 Consultation Activities	Date
Notice of PIC #2 is published	May 5, 2022
PIC #2 (virtual)	May 19 – June 19, 2022
Distribution of Draft ESR	November 4, 2022

7.1.5.1 Summary of Phase 3 Consultation

At the start of Phase 3, the Halton Region requested that the Region of Peel consider opportunities for further encroachment into the Mount Zion Cemetery, to avoid significantly impacting the residential properties on the west side of the roadway. As a result, additional archaeological investigations were required, as well as additional meetings with pertinent agencies. The details of these meetings are summarized in the following sections.

A meeting was held between the Halton Region, the Region of Peel and the City of Brampton on January 16, 2017 regarding cemetery encroachment opportunities. The purpose of the meeting was to gain a better understanding of whether the limits of the cemetery are to be viewed as a hard constraint for the alignment planning, or if some encroachment can be considered. In addition, it was discussed how to best determine the limits of the graves to fully understand where the ROW of the future widened road should be located. Halton Region advised that impact to the west side is significant and therefore it is important to know how far into the cemetery the roadway alignment can extend without impacting the graves or the use of the cemetery. The City of Brampton advised they are agreeable to having further studies completed on the property as long as there are mitigation measures carried forward into detailed design. The City agreed to assist in coordinating access to the cemetery. They advised of concerns related to drainage, as the roadway is higher than the cemetery.

A conference call was held with Halton Region on November 27, 2017 regarding the cemetery work. The information collected from the cemetery surveys was presented on the call. It was recommended to move forward based on the completed investigations to review alternative alignments based on the new information. A meeting was held with Halton Region, the Region of Peel and ARA December 5, 2017 to discuss what has been completed and to identify what further investigations are necessary.

TAC #3 was held on September 14, 2021 to provide an update on the study, present the findings of the technical studies, the evaluation of alternative designs and to review the comment/response table. The preliminary design was shared with attendees on August 6, with comments/feedback requested by August 25, 2021. The Project Team prepared responses as to how each of the comments would be addressed and discussed them at TAC #3. A copy of the comment/response table is included in **Appendix M**. There were 45 people in attendance at the TAC. Comments from the meeting related to the following topics: ZUM locations, Alectra poles, property acquisition, coordination with Region of Peel infrastructure projects (water/stormwater), full-turn movements, and adjacent ongoing Projects.

The Notice of PIC #2 (included in **Appendix M**) was posted in Halton Hill's Independent and Free Press, Brampton Guardian Newspaper, and the Mississauga News newspaper on May 5th and May 12th, 2022. A notice and letter were mailed out to approximately 52 property and business owners within the Study Area, as well as Indigenous Communities and 133 Review agency contacts on May 18, 2022. The notice was also posted on the Peel Region EA website. The Region of Peel issued notices via the Region of Peel Public Works twitter feed.

The PIC #2 was made available virtually from May 19 – June 9, 2022. The Project website included a virtual PIC (vPIC), coordinated by CivicPlan, as well as a voice over presentation of the PIC panels. The vPIC allowed participants to learn about the project and provide input on key issues and concerns in the study area. PIC #2 provided the public with a summary of PIC #1 and the activities that have occurred since, the alternative design concepts which are currently being considered to address transportation requirements in the Study Area. The comment period for PIC 2 was open from May 19 – June 19, 2022.

The vPIC had 42 visitors and three participants. It should be noted that property owners of properties proposed to be impacted as a result of this Project, were consulted in advance of the PIC. The Project Team feels that this effort in advance of the PIC was a success to engage with those impacted along the corridor. A summary of discussions with the property owners is included in **Appendix M**.

The Draft ESR was distributed to government agencies, stakeholders and Indigenous communities and organizations for review. The comment period for agencies and stakeholder was from November 4, 2022 – November 25, 2022. A follow-up e-mail was sent out on November 25, 2022, to encourage any final comments. The Region of Peel continued to receive comments from stakeholders and agencies up until December 20, 2022. All comments received during this period have been included in the Master Comment Log in **Appendix M**.

7.1.6 Indigenous Engagement

Indigenous consultation is a key component of the Municipal Class EA process. The province has delegated the procedural aspects of the Duty to Consult to the Region of Peel for the purposes of this study.

7.1.6.1 Identification of Indigenous Communities and Groups

A total of five Indigenous Communities were consulted throughout the Study, including:

Indigenous Communities:	Haudenosaunee Confederacy Chiefs Council
	Métis Nation of Ontario
	Mississaugas of New Credit First Nation
	Six Nations of the Grand River Territory
	Huron Wendat Nation
Indigenous Agencies and Groups:	Ministry of Indigenous Affairs
	Ministry of Indigenous Affairs and Northern Development Canada
	Peel Aboriginal Network (PAN)

7.1.6.2 *Summary of Indigenous Engagement Milestones*

Letters and comment forms were distributed to the Indigenous communities, agencies and groups listed above on November 17, 2014, as part of the Notice of Commencement. The comment form was intended to provide preliminary input and preference for further participation in the study, as well as contact preferences.

A Notification letter was mailed to the Ontario Ministry of Indigenous Affairs and Ministry of Indigenous Affairs and Northern Development Canada (now known as Indigenous and Northern Affairs Canada) on December 1, 2014. The letter provided a detailed description of the study and provided an opportunity to submit their initial comments on the Study. Both Ministries advised of the appropriate Indigenous communities and groups to contact, given the potential impact or interest in the Study Area.

The Huron-Wendat advised of interest in participating in all archeological fieldwork, as well as receiving copies of the draft reports for review and comments. They also requested to be kept informed of upcoming environmental studies related to wildlife. The Project Team shared the final Stage 1 and 2 Archaeological Assessment Reports with the Huron-Wendat.

The Draft ESR was distributed to the Chief and a secondary representative of the Indigenous communities and organizations listed above on November 4, 2022. The Draft ESR report was distributed via an e-mail containing a tailored letter briefly summarizing the Study and describing the method for accessing, reviewing, and providing feedback on the Draft ESR. Comments were accepted in any format, and a comment log template was provided for ease of use. The comment period for Indigenous communities and organizations was open from November 4, 2022, to December 9, 2022. Late comments received up until December 20, 2022, were also considered and incorporated into the final ESR. One comment was received during the comment period from the Haudenosaunee Confederacy Chiefs Council (HCCC) which stated that the level of engagement was not sufficient and that additional time and resources for review would be required. An additional extension for review of the Draft ESR was granted to Haudenosaunee Confederacy upon request, and funding was provided by the Regional of Peel to assist with their review of the report.

The Draft ESR distribution letters and correspondence between Haudenosaunee Confederacy and the Region of Peel have been included in **Appendix M**.

8. Identification and Evaluation of Alternative Design Concepts

8.1 Alternative Design Concepts for the Preferred Solution

An integral component of the Class EA process is the identification and evaluation of alternative design concepts for the preferred design concept. Based on the recommended planning solution to widen Winston Churchill Boulevard to accommodate the anticipated increase in traffic, the Study Team proposed three preliminary design concepts. The following preliminary design concepts were identified and evaluated:

- Widen Winston Churchill Boulevard along the Centreline;
- Widen Winston Churchill Boulevard to the East; and
- Widen Winston Churchill Boulevard to the West

8.1.1 Alternative Design 2 – Widen Winston Churchill Boulevard along the Centreline

Alternative Design 2 was based on widening the corridor along the centre line, which is consistent with Winston Churchill Boulevard being a boundary road between two regional and four local area municipalities. It attempts to find an equitable solution to providing additional capacity that affects the municipalities and adjacent properties in a more uniform way. As an initial basis for evaluation, a more or less equal widening of the existing right of way was considered to each side of the corridor. Widening of some sections of the corridor had been achieved through dedications and past construction projects. The widening to achieve a 45 m corridor width was based on a centerline fitted to the narrowest parts of the corridor where an equal widening to the east and west sides was made.

8.1.2 Alternative Design 3 – Widen Winston Churchill Boulevard to the East

Alternative 3 was based on widening the corridor entirely to the east side. The narrowest sections were widened to the 45 metre limit and a new eastern property line was established. These widened sections were blended in areas of the corridor that were already at least 45 m in width.

8.1.3 Alternative Design 4 – Widen Winston Churchill Boulevard to the West

Alternative 4 was based on widening the corridor entirely to the west side in the same manner as used in Alternative 3.

8.2 Evaluation of Alternative Design Concepts

The corridor was segmented for analysis into three sections based on differences in physical and traffic characteristics. The sections are as follows:

- Section 1: Highway 401 to Steeles Ave. with existing 4-basic-lane cross section with added turning lanes at intersections, bridge structures and highest traffic volumes.
- Section 2: Steeles Ave. to Maple Lodge Farms (2.0 kilometres south of Embleton Road) with an existing 4-lane cross section with flush centre median, left turn lanes at intersections and adjacent residential and commercial land use.

- Section 3: 2.0 kilometres south of Embleton Road to Embleton Road. – with an existing 2-lane cross section with two-way left turn lane and residential and agricultural land use.

The overall objective of the evaluation was to identify a Design Concept that will address projected traffic needs while considering planning policies, traffic safety, existing environment, and input from the public, stakeholders, agencies and Indigenous communities. A set of evaluation criteria was assembled based on the existing conditions within the Study Area to comparatively evaluate the three Alternative Design Concepts identified in the previous section. The Criteria used to carry out the evaluation of the design concepts are listed in **Table 8-1**.

Table 8-1: Evaluation Criteria for Alternative Design Concepts

Criteria	Evaluation
Transportation Planning	• Improve Traffic Capacity • Meet Official Plan Objectives • Improve Active Transportation • Improve Safety
Engineering	• Improve Storm Water Management • Minimize Impacts to Geomorphology • Minimize Impacts on Existing Culverts
Socio-Economic Environment	• Minimize Impacts to Archaeological and Cultural Heritage Features • Minimize Impact to Existing Residences • Minimize Impact to Existing Businesses • Compatibility with Existing land use
Natural Environment	• Minimize Impact to Aquatic Features • Minimize Impact to Vegetation and Trees • Compatibility with Environmental Policies
Costs	• Capital Costs • Minimize Property Requirements

Three ratings were used to evaluate the Alternative Design Concepts, including:

- Not Preferred
- Preferred
- Most Preferred

The following subsections include the evaluation of alternative design concepts for each section of the roadway, as well as the rationale for the chosen preferred design concept. A detailed table outlining the evaluation of alternative design concepts is provided in **Appendix N**.

8.2.1 *Evaluation of Alternative Design Concepts for Section 1 (Highway 401 to Steeles Ave.)*

Table 8-2 provides a summary of the evaluation of alternative design concepts for Section 1 of the Study Area (Highway 401 to Steeles Ave.).

Table 8-2: Section 1 - Highway 401 to Steeles Avenue

Criteria	Alternative 2: Widen along Centre	Alternative 3: Widen to the East	Alternative 4: Widen to the West
Transportation	✓	✓	✓
Engineering	–	–	–
Socio-Cultural	–	–	–
Natural Environment	✓	✓	✓
Costs	–	–	–
Recommendation	NOT PREFERRED	PREFERRED	NOT PREFERRED

8.2.1.1 *Alternative 2 – Widen Along the Centreline (Not Preferred)*

Alternative 2 is preferred from a transportation and natural environment perspective. This Alternative meets the LOS for forecasted traffic volumes, meets Official Plan objectives, provides opportunities for safety improvements as well as provides improvements to active transportation. It has minimal impact to air quality, noise, archaeological, and cultural heritage features.

Alternative 2 is not preferred from an engineering/technical perspective as widening to the west, on the lower side of the superelevated the bridge deck reduces the vertical clearance to the highway below the minimum acceptable level. The mainline highway lanes would need to be lowered to maintain vertical clearance over the highway. Additionally, this alternative requires the realignment of the ditch connecting to the existing 407ETR ditch. Both Highway 401 ramps would need to be reconfigured including the South-West ramp, and the East-North/South ramp to accommodate this Alternative. All of these additional requirements, the design of the 407ETR structure and impacts to businesses on the west side of the corridor result in significant costs.

8.2.1.2 Alternative 3 – Widen to the East (Preferred)

Alternative 3 is preferred from a transportation and natural environment perspective. This alternative meets the LOS requirements for forecasted traffic volumes, meets Official Plan objectives, provides opportunities for safety improvements, and provides improvements for active transportation. It also can accommodate the widening of the 407ETR bridge structure with a widening to the high side of the superelevated bridge deck. It has minimal impact to air quality, noise, archaeological and cultural heritage features.

Alternative 3 requires extending the 407ETR structure to the east to accommodate the widening of the roadway platform. There are some impacts to local businesses on the east side including parking north of the 407ETR; however, stormwater management adjustments and minimizing grading in these areas can potentially reduce this impact. Some property will be required from the Ministry to accommodate this alternative.

8.2.1.3 Alternative 4 – Widen to the West (Not Preferred)

Alternative 4 is preferred from a transportation, and natural environment perspective. This alternative requires minimal property costs and has minimal impact to businesses on the west side.

Alternative 4 is not preferred from an engineering point of view as the widening to the lower side of the superelevated bridge deck reduces vertical clearance to the highway lanes below the minimum acceptable level. The reconfiguration of the 407 ETR structure to accommodate this alternative would result in significant costs, as well as impact to businesses on the west side.

8.2.2 Evaluation of Alternative Design Concepts for Section 2 (Steeles Ave. to Maple Lodge Farms)

Table 8-3 provides a summary of the evaluation of alternative design concepts for Section 2 from Steeles Ave. to Maple Lodge Farms.

Table 8-3: Section 2 – Steeles Avenue to Maple Lodge Farms

Criteria	Alternative 2: Widen along Centre	Alternative 3: Widen to the East	Alternative 4: Widen to the West
Transportation	✓	✓	✓
Engineering	–	–	–
Socio-Cultural	–	✗	✗
Natural Environment	–	–	–
Costs	–	–	–
Recommendation	PREFERRED	NOT PREFERRED	NOT PREFERRED

8.2.2.1 *Alternative 2 – Widen Along the Centreline (Preferred)*

Alternative 2 is preferred from a transportation perspective. This alternative meets the LOS requirements for forecasted traffic volumes, meets Official Plan objectives, provides opportunities for safety improvements, as well as provides improvements to active transportation. There is an opportunity to improve stormwater management through provision of a storm sewer or ditches. It has minimal impact to aquatic features, has less costs associated with the rehabilitation of the existing roadway, and minimizes impacts to businesses on both sides of the road.

Alternative 2 is not preferred due to the significant impacts to cultural heritage resources on the east side associated with Mount Zion Cemetery. The Maple Lodge Farms parking lots and the Chicken Shoppe on the east side would also be impacted by this alternative. There are also moderate costs associated as a result of the 14 properties that would be impacted.

Alternative 2 was revisited following the completion of the Stage 2 Archaeological Assessment for the Mount Zion Cemetery. Given the constraints of the houses on the west side, and the Mount Zion Cemetery on the east side, the Project Team mitigated the impact by reducing the cross-section width requirements to achieve a better fit, resulting in less property impacts to both key features along the corridor.

8.2.2.2 *Alternative 3 – Widen to the East (Not Preferred)*

Alternative 3 is preferred for transportation. This alternative meets the LOS requirements for forecasted traffic volumes, meets Official Plan objectives, provides opportunities for safety improvements, and provides improvements to active transportation. There is an opportunity to improve stormwater management through provision of a storm sewer or ditches. Like

Alternative 2 it has minimal impact to aquatic features and is preferred by CVC, as it requires an extension of culverts only on one side of the roadway.

Alternative 3 is not preferred due to significant impact to Mount Zion Cemetery on the east side and the cultural heritage resources associated with it. It also has significant impacts on the access to Maple Lodge Farms, as well as impacts to the parking lot and building. There are impacts to residential and commercial properties required on the east side. A total of 15 properties would be required, resulting in significant costs associated with property acquisition. Additionally, there are moderate costs associated with the culvert extension and the reconstruction of a full segment of the roadway on the east side.

8.2.2.3 Alternative 4 – Widen to the West (Not Preferred)

Alternative 4 is preferred from a transportation perspective, similar to Alternatives 2 and 3. However, this Alternative has the advantage of having no impact to cultural heritage resources. It also has minimal impacts to aquatic features and is a preferred option from CVC.

Alternative 4 has a significant impact to a residence on the west side of the road and will require 14 residential properties, including several full buy-outs. This Alternative would require reconstruction of a full segment of the roadway on the west side.

8.2.3 Evaluation of Alternative Design Concepts for Section 3 (Maple Lodge Farms to Embleton Rd.)

Table 8-4 provides a summary of the evaluation of alternative design concepts for Section 3 from Maple Lodge Farms to Embleton Rd.

Table 8-4: Section 3 – Maple Lodge Farms to Embleton Road

Criteria	Alternative 2: Widen along Centre	Alternative 3: Widen to the East	Alternative 4: Widen to the West
Transportation	✓	✓	✓
Engineering	–	–	–
Socio-Cultural	✓	–	–
Natural Environment	–	–	–
Costs	–	–	–
Recommendation	PREFERRED	NOT PREFERRED	NOT PREFERRED

8.2.3.1 *Alternative 2 – Widen Along the Centre (Preferred)*

Alternative 2 is preferred from a transportation and socio-economic environment perspective. This Alternative meets the LOS requirements for forecasted traffic volumes, provides opportunities for safety improvements, as well as provides improvements to active transportation. This Alternative also facilitates the widening transition to the section of Winston Churchill Boulevard north of Embleton Road. There is an opportunity to improve stormwater management through provision of a storm sewer or ditches. It has minimal impact to residential properties, and equally distributes property impact to the east and west. This alternative would also result in improved access to businesses. Alternative 2 has moderate impacts to cultural heritage resources on the west side. There are also impacts to the wetlands associated with Levi Creek North and South (dry-moist old meadow and mineral cultural thicket), including potential impacts to fish species at Levi Creek North due to the required realignment.

8.2.3.2 *Alternative 3 – Widen to the East (Not Preferred)*

Alternative 3 is preferred from a transportation perspective. This alternative meets the LOS requirements for forecasted traffic volumes, provides opportunities for safety improvements, and provides improvements to active transportation. There is an opportunity to improve stormwater management through provision of a storm sewer or ditches. This Alternative has reduced impacts to residences, and a moderate capital cost. This design also presents an opportunity to improve access to businesses and residences along the roadway via Two-Way Left Turn Lane (TWLTL).

Alternative 3 does not facilitate transition for widening Winston Churchill Boulevard north of Embleton Road. This alternative also impacts one cultural heritage resource, wetlands associated with Levi Creek North and South (dry-moist old meadow and mineral cultural thicket), as well as potential impact to the fish and fish habitat located at Levi Creek North. There are also significant impacts to residences located near the roadway.

8.2.3.3 *Alternative 4 – Widen to the West (Not Preferred)*

Alternative 4 is preferred from a transportation perspective. This Alternative meets the LOS requirements for forecasted traffic volumes, provides opportunities for safety improvements, and provides improvements to active transportation. There is an opportunity to improve stormwater management through provision of a storm sewer or ditches. There is minimal impact on wetlands associated with Levi Creek North and South. This design also presents an opportunity to improve access to businesses and residences along the roadway via a TWLTL.

Alternative 4 does not facilitate transition for widening Winston Churchill Boulevard north of Embleton Road. It also has the potential to impact five cultural heritage resources. There is a significant capital cost associated with property acquisition.

8.3 Selection of Preferred Design Concept

Based on the evaluation of Alternative Design Concepts, the following preferred design concepts were identified for each of the respective sections of Winston Churchill Boulevard:

- **Section 1 (Highway 401 to Steeles Ave.)**: Alternative 3 was chosen to widen Winston Churchill Boulevard to the east;
- **Section 2 (Steeles Ave. to Maple Lodge Farms)**: Alternative 2 was selected to widen Winston Churchill Boulevard along the centerline; and lastly
- **Section 3 (Maple Lodge Farms to Embleton Road)**: Alternative 2 was also selected to widen Winston Churchill Boulevard along the centreline.

All Preferred Design Concepts provide satisfactory LOS for forecasted traffic volumes.

Some of the potential benefits associated with the Preferred Design Concepts include:

- Improved capacity to accommodate future traffic volumes;
- Improved traffic flow with less congestion and reduced vehicle emissions;
- Safety improvements; and
- Active transportation improvements through the provision of 3m wide MUP from the Highway 401 E-N/S ramp northerly to Steeles Avenue, a sidewalk on the west side from Highway 401 to Steeles Avenue, and a 3m MUP on both sides of the roadway from Steeles Avenue to Embleton Road.

Some of the potential impacts associated with the Preferred Design Concepts include:

- Permanent changes to access to some residential and employment land uses;
- Temporary disruption to residents, businesses, and road users during construction due to increased noise, dust, traffic delays, and access;
- Potential to impact Redside Dace (SAR) habitat during extension of Culverts 8 and 10 associated with Levi Creek South and Levi Creek North;
- Potential to impact Barn Swallow (SAR) if properties to be acquired include structures that have open barns, and/or as part of extensions of structural culverts 3, 8 and 10;
- Potential to impact Bobolink (SAR) if properties to be acquired include suitable habitat for the species;
- Potential to impact Levi Creek Wetland Complex PSW associated with Levi Creek South and North;
- Removal of some roadside vegetation and some mature trees;

- Impact to seven cultural heritage landscapes and built heritage resources, requiring a heritage impact assessment to understand impact; and
- Impact to archaeological resources requiring the need for additional investigations during detailed design.

9. Description of the Recommended Plan

9.1 Road Design

9.1.1 Section 1 (Highway 401 to Steeles Ave.)

The preferred design concept for Section 1 of Winston Churchill Boulevard is to widen the roadway to the east from four lanes to six lanes with a centre median and additional turning lanes at intersections. The cross section for this section is approximately 47.5-metre wide. A 3-metre MUP is currently planned for the east side of the corridor from the E-N/S ramp northerly to Steeles Avenue, and a 1.8-metre sidewalk for the west side. Discussion with the City of Mississauga/MTO will be revisited during detailed design regarding the MUP connection over the Highway 401 structure on the east side with consideration to be given to implement this connection during future rehabilitation and/or replacement of the Highway 401 structure. See **Figure 9-1** for a graphic rendition of the preferred design concept for Section 1.

The six lanes will be 3.5-metre in width, with a 3.5-metre turn lane and 2-metre median at intersections to delineate turning movements and provide an area for intersection signal poles and infrastructure. Street lighting and hydro poles are to be located to the outside of the sidewalk/MUP on both sides of the roadway. Additional details for all segments of the road are included in the plan/profile plates in **Appendix N**.

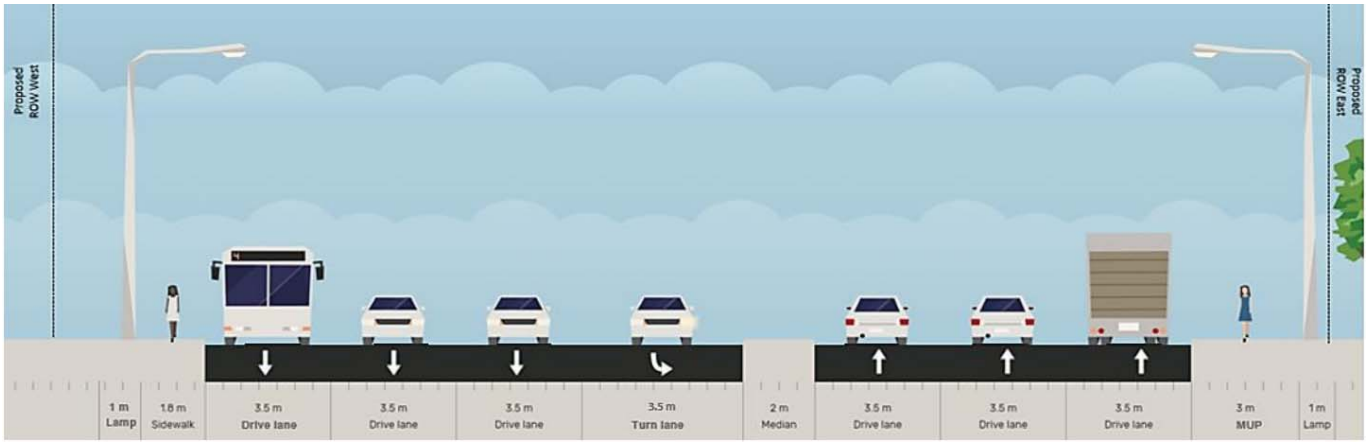


Figure 9-1: Preferred Cross Section Design for Section 1

A Class EA was completed for Steeles Avenue improvements from Chinguacousy Road / Mavis Road to Winston Churchill Boulevard in 2014. The preferred design progressed to detailed design, and construction is planned to commence in 2025. The design includes widening Steeles Avenue using a hybrid approach based on the existing alignment with minor modification at intersections to accommodate turning lanes.

9.1.2 *Section 2 (Steeles Ave. to Maple Lodge Farms)*

The preferred design concept for Section 2 of Winston Churchill Boulevard is to widen the roadway on both sides of the centreline from four to six 3.5-metre lanes with a 4.5-metre two-way left-turn lane. The cross section for this section is approximately 40-metres wide to reduce the impact on residential properties on the west side, and the Mount Zion Cemetery on the east side. A 3 m MUP is planned for both sides of the corridor. See **Figure 9-2** for a graphic rendition of the preferred design concept. Bus stops will be provided on both sides of the roadway in key locations up to Maple Lodge Farms.

In the event that the west side of the roadway is redeveloped in the future, the cross section would be widened to 45m. These future improvements are protected for in the design and are included in the Recommended Plan.

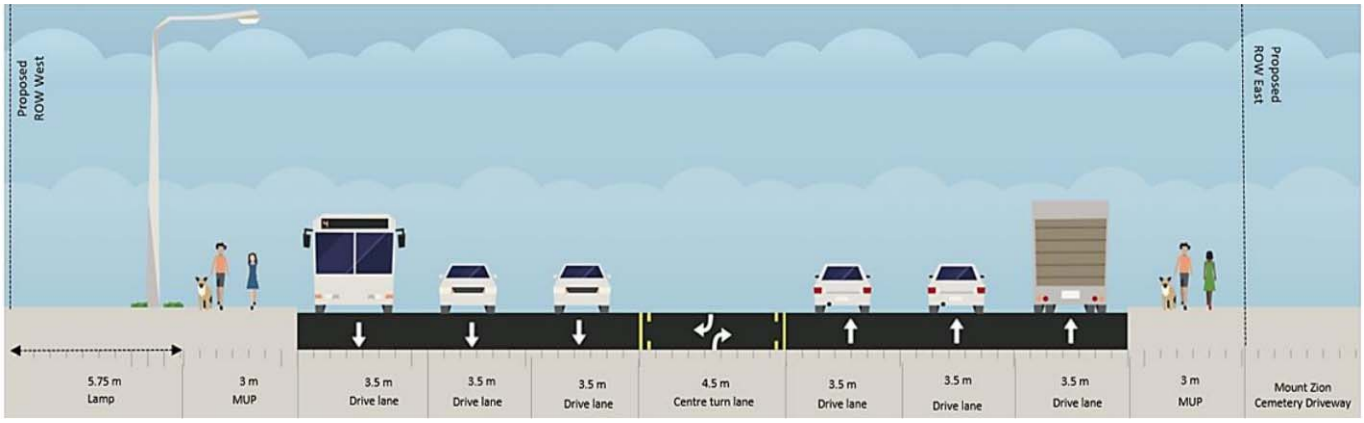


Figure 9-2: Preferred Cross Section Design for Section 2 (Steeles Ave. to Maple Lodge Farms)

9.1.3 *Section 3 (Maple Lodge Farms to Embleton Road)*

The preferred design concept for Section 3 of Winston Churchill Boulevard is to widen the roadway on both sides of the centreline from two lanes with centre two-way left turn lane to six 3.5-metre lanes with a flush median 4.5-metre two-way left turn lane. The cross section for this section is approximately 40- to 42.5-metres wide. A 3 m MUP is planned for both sides of the corridor. See **Figure 9-3** for a graphic rendition of the preferred design concept for Section 3.

Flush medians are proposed to extend for the entire roadway section to provide safe access to residential and commercial properties. Access to some properties near existing or planned intersections will have some turning movements restricted by using sections of raised median to improve safety.

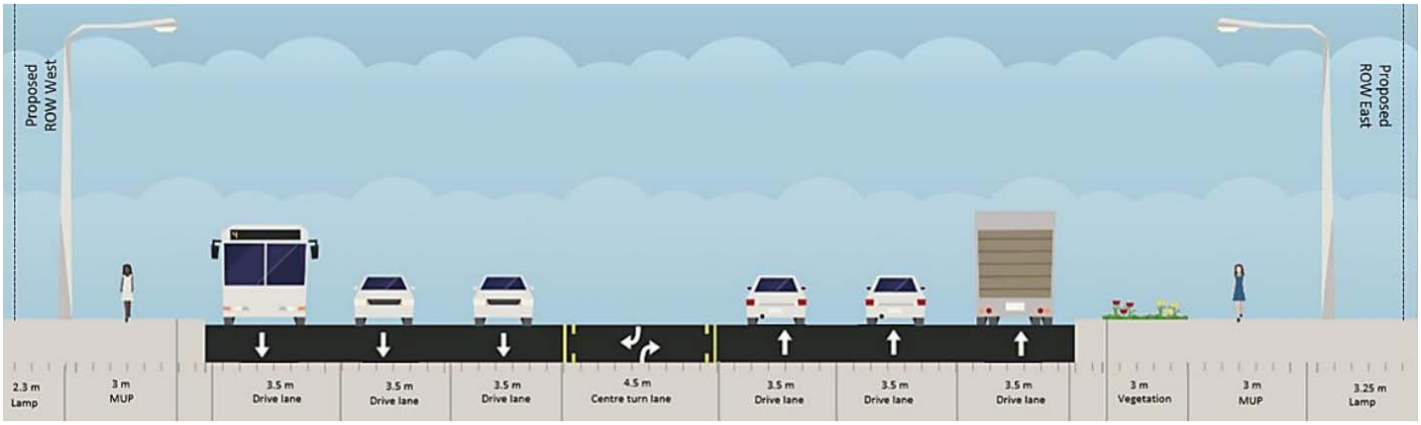


Figure 9-3: Preferred Cross Section Design for Section 3

9.2 Design Criteria

Winston Churchill Boulevard is planned to be an industrial connector. The geometric details for the roadway segment from the Orlando Entrance to Embleton Road is presented in **Table 9-1.**

Table 9-1: Design Criteria Orlando Entrance to Embleton Road (1+000 to 4+420)

	Design Standards	Design Standards (Desired)	Design Standards (Proposed)
Roadway Classification	UAD 70	UAD 70	UAD 70
Min. Stopping Sight Distance	135 m	135 m	516 m
Equiv Min K Factor Crest	35	35	44
Equiv Min K Factor Sag	30	30	31
Grades Max.	6-8%	6-8%	1.40%
Grades Min.	0.5%	0.5%	0.5%
Design Vehicle	WB19	WB20	WB20
Superelevation	0.06 m/m	0.06 m/m	
Lane Width	3.5 – 3.7 m	3.65 – 3.75 m	3.5 m
Through Lanes	3.5 – 3.7 m	3.65 – 3.75 m	3.5 m
Left Turn Lanes	3.3 m	3.5 m	3.3 m
Right Turn Lanes	3.3 m	3.5 m	3.3 m
Multi-Use Path	3.0 – 4.0 m	3.0 m	3.0 m
Shoulder Rounding	0.5 m	0.5 m	0.5 m
Median Width	(min) 2.0 m	5.0 m	1.2 – 4.5 m
ROW Width	45 m	45 m	45 m
Posted Speed	60 km/h	60 km/h	60 km/h*

*Posted speed limit to be revised to 60km/h for entire study area pending council approval.

9.3 Horizontal and Vertical Alignment

The horizontal alignment for the Recommended Plan will generally follow the existing road alignment with widening as described in Section 9.1. However, in some sections between Steeles Avenue and Embleton Road the cross-section width has been reduced to mitigate impacts to both the east and west sides of the roadway, in particular in the area adjacent to the Mount Zion Cemetery and residential properties on the west side. In the northern section where there are houses near the roadway on both sides of the roadway, the cross-section width has also been narrowed to reduce property impacts.

In general, the vertical alignment follows the existing ground profile, except in locations where minor shifts in the crown of the road are required. The design of the vertical alignment is to be reviewed in detailed design and may need to be refined to satisfy controlled drainage requirements.

9.3.1 Pavement Design

9.3.1.1 Pavement Widening

For all pavement widening, the new pavement thickness should match or exceed the thickness of the existing pavement so that positive subsurface drainage is maintained across the widened area. The thickness of the granular subbase is recommended to be increased to ensure adequate drainage is maintained within the frost penetration depth. The new pavement structure should consist of:

40mm	HL1
150mm	HDBC (3 lifts)
150 mm	Granular ‘A’ Base
850 mm	Granular ‘B’ Type 1 Subbase

9.3.1.2 Pavement Rehabilitation

The recommended 2031 rehabilitation strategy for existing pavement between Steeles Avenue and Embleton Road should consist of 40 mm partial depth milling followed by the placement of a two-lift asphalt overlay. The recommended asphalt materials and layer thickness should consist of:

40 mm	HL1
50 mm	HDBC

Pavement design and rehabilitation requirements will be reviewed and updated in detailed design.

9.4 Active Transportation and Transit

A 3 m MUP will be provided on both sides of the roadway from Steeles Avenue northerly to Embleton Road. South of Steeles Avenue, a 3 m MUP will be provided from the E-N/S ramp northerly to Steeles Avenue. A sidewalk will be provided on the west side from Highway 401 northerly to Steeles Avenue. The MUP will be separated from the roadway by a 2.5-metre buffer / green zone strip where space allows. Some sections of roadway will not be able to accommodate this buffer in order to minimize the amount of residential property required within the segment from Steeles Avenue and Maple Lodge Farms.

The recommended pavement structure for the construction of the MUP is:

40 mm	HL1
50 mm	HDBC
300 mm	Granular A

New bus stops are planned along the corridor as indicated in the Recommended Plan.

9.5 Intersections

There are seven existing intersections, and four proposed new intersections serving future development in the area. All signalized intersections will be equipped with crosswalks and cross-rides for safe travel across the intersection for pedestrians and cyclists.

Existing intersections will be improved to provide six through lanes and left and right-turn lanes will be provided at signalized intersections where warranted. **Table 9-2** presents a summary of intersections within the Study Area.

Table 9-2: Summary of Intersections within the Study Area

Intersecting Roadway	Existing Intersection	Future Intersection
Highway 401 East-North/South Ramp	Signalized	Signalized
Meadowpine Boulevard	Signalized	Signalized
Orlando Access	Signalized	Signalized – detailed design to review alternative connections for Safe Storage and property to the south. Alternative may include constructing parallel access road to provide full movement access following construction aligning with Orlando.
Steeles Avenue	Signalized	Signalized – tie-in with Steeles Avenue widening detailed design being

Intersecting Roadway	Existing Intersection	Future Intersection
		undertaken by Region of Peel
Future Collector Road (north of Chicken Shoppe)	Unsignalized	Unsignalized – pending EA currently being undertaken by City of Brampton
Maple Lodge Farms (south entrance)	Signalized	Signalized
Maple Lodge Farms (north entrance)	Unsignalized	Unsignalized – two-way left turn lane proposed to maintain full-turn movement
Future Financial Drive	No Existing Intersection	Signalized – to be coordinated with detailed design Bramwest Parkway / Financial Drive detailed design
Future Collector Road between Future Financial Drive and Embleton Road (see note below)	Unsignalized	Signalized
Embleton Road	Signalized	Signalized

The current Regional and City planning documents have shown a future collector road intersecting with Winston Churchill Boulevard between the future Financial Drive Extension and Embleton Road. However, the GTA West (Highway 413) is planned to have an interchange at Winston Churchill Boulevard south of Embleton Road. The final location and configuration of the interchange and the planned collector road should be reviewed during detailed design when the details of the interchange are known.

9.6 Highway 401 to North of 407ETR

9.6.1 Design Criteria

The geometric details for the roadway from Highway 401 to the Orlando Entrance are presented in Table 9-3.

Table 9-3: Design Criteria from Highway 401 EB off-ramp to 300 m north of 407ETR / Orlando Access (0+205 to 1+1000)

	Design Standards	Design Standards (Proposed)
Highway Classification	UAD 70	UAD 70
Min. Stopping Sight Distance	135 m	145 m
Equiv Min K Factor Crest	35	29
Equiv Min K Factor Sag	30	30
Grades Max.	6-8%	4.4%
Superelevation	0.06 m/m	0.03-0.04 m/m
Pavement Width	10.5 m	10.5
Lane Width	3.5 – 3.75 m	3.5 m – 3.75m
Through Lanes	3.5 – 3.75 m	3.5 – 3.75 m
Left Turn Lane	3.0 m	3.5 m
Right Turn lane	3.25 m	3.5 m
Multi-Use Path	3.0 – 4.0 m	3.0 m
Shoulder Rounding	0.5 m	0.5 m
Median Width	2.0 m (min)	2.0 – 5.5 m
Side Clearance at structures (right)	2.5 m	1.5 m
ROW Width	45 m	Varies 50 – 90 m
Posted Speed	60 km/h	60 km/h

9.6.2 Horizontal and Vertical Alignment

The horizontal and vertical alignment have been developed to tie into the recent construction of the Highway 401 interchange, including new carpool lot, and the 407ETR structure.

9.6.3 Typical Cross Sections

9.6.3.1 407ETR

The 407ETR structure recently had a new centre pier and pier cap constructed on the east side, to support a future widening of the 407ETR structure. These improvements were completed by the 407ETR Concessionaire during construction of median improvements on the 407ETR. The widened highway structure will include an elevated 3.5-metre MUP on the east side, and a 2.0 m wide sidewalk on the west side (shown in **Figure 9-4**).

A general arrangement drawing for the structure is included in **Appendix N**.

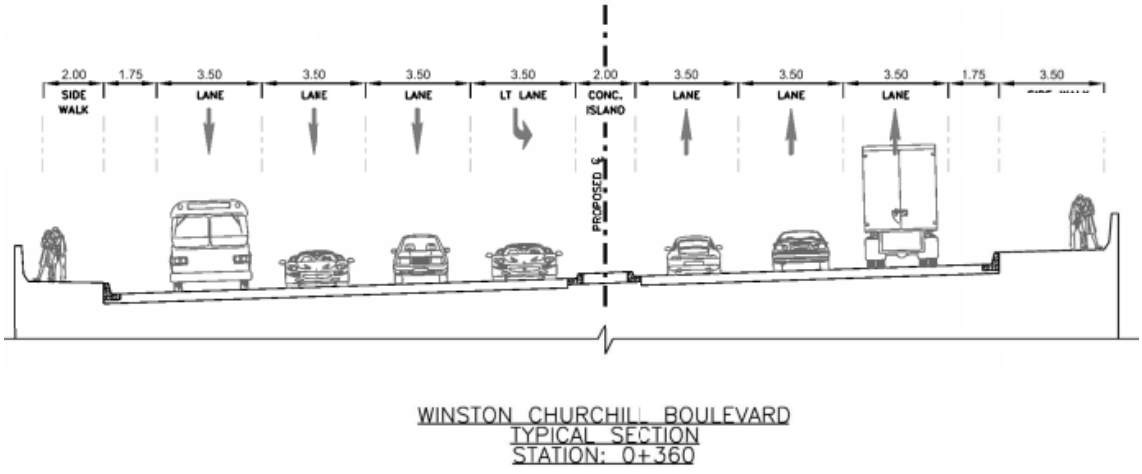


Figure 9-4: 407ETR Structure

9.6.4 Highway 401 North Ramp Terminal

From the north side of the Highway 401 structure, the cross-section includes three northbound lanes and three southbound lanes, with a left-turn lane providing access to the carpool lot in the northwest quadrant of the interchange of Highway 401 with Winston Churchill Boulevard. North of the eastbound off ramp (E-N/S ramp) the cross-section includes three northbound lanes and three southbound lanes, as well as a raised median to restrict turning movements (shown in **Figure 9-5)**. The alignment of Winston Churchill Boulevard north of the Highway 401 structure has been developed to tie into the recently constructed MTO Highway 401 interchange.

The design of improvements at Highway 401, including the new interchange and other design components (undertaken by others) is presented in **Appendix N**.

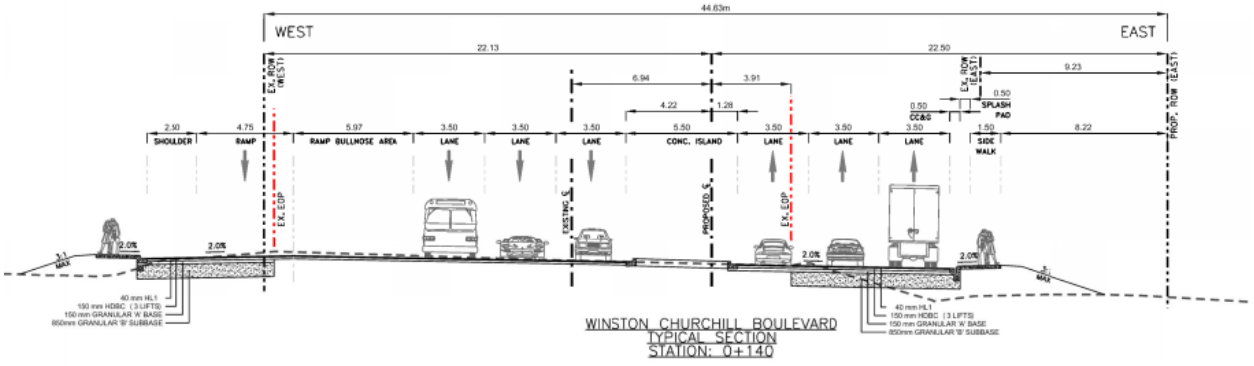


Figure 9-5: Cross-Section just north of Highway 401 Structure

9.6.5 Active Transportation

From the E-N/S ramp to Meadowpine Boulevard a MUP is proposed on the east side. South of the ramp, a concrete sidewalk is provided to the Highway 401 structure to tie into an existing sidewalk extending across the structure on the east side. A concrete sidewalk is to be provided on the west side southerly from Steeles Avenue to connect to the existing concrete sidewalk on the west side of the structure.

During detailed design, the Region of Peel will engage with MTO and the City of Mississauga regarding possible future extension of the MUP on the east side southerly over the Highway 401 structure to tie into a planned extension by the City of Mississauga of a MUP on the east side of Winston Churchill Boulevard northerly from Argentia Road.

9.7 Drainage and Stormwater Management

The existing conditions and proposed stormwater management measures for the roadway are documented in the Drainage and Stormwater Management Report (**Appendix E**). Throughout the Study Area, the roadway will be widened to 6 lanes, including a centre median to accommodate a two-way left-turn lane where needed for access to adjacent properties, turning lanes at intersections and a MUP on the east side, and a sidewalk on the west side of the roadway.

The proposed drainage concept for the Study Area considers treatments for each of the three roadway segments. Based on existing site condition, the following recommendations for future road design considerations, soil condition and available space have been made:

- For the minor system flow (10-year design flow), the drainage from the urban cross-section is drained to the catch basins which are connected to the storm sewer network located under the median of the road;
- The major flows will follow the road system to the major culvert outlets. Overland flows are to be conveyed to the downstream end of the culvert crossing structures;
- The culvert crossings are to convey the external flows across Winston Churchill Boulevard; and,
- Underground storage chambers (Stormtech or equivalent) and OGS are to be installed as part of the SWM treatment train approach.

The preferred design has been developed per the MECP's *Stormwater management Planning and Design Manual* (2003). The preferred design will include curbs and gutters along the green zone strip to capture water from the roadway. The stormwater management system will include catch basins and stormwater retention facilities. All existing non-structural culverts will be extended to the outer limits of the graded area.

9.8 Structures

The recommended widening of Winston Churchill Boulevard includes the lengthening of three structural culverts, and seven non-structural culverts. On both sides of structural and non-

structural culverts, a permanent easement will be acquired to provide access to the culvert for maintenance and operations.

9.8.1 *Structural Culverts*

Culvert 3 will include a realignment of Levi Creek North, requiring additional land on the west side of the roadway. As per the fluvial geomorphic assessment, channel realignment should properly observe the final meander beltwidths and closely resemble existing geomorphic parameters. Proper pool/riffle sequences, substrates, and low flow channel should also be considered.

General arrangements for each of the three structural culverts are included in **Appendix O Structural Report**.

Culvert 3 requires an extension of 21,600mm on the east side, and 5,900mm on the west side. Culvert 8 requires an extension of 10,300mm on the east side, and 10,400mm on the west side. Culvert 10 requires an extension of 19,900mm on the east side and 9,800mm on the west side.

Based on the inspection reports completed for each of the three structural culverts – drainage through the existing culverts needs to be regraded. Minor rehabilitation is required at Culvert 3 including to seal wide cracks in the barrier wall, and patch repair to concrete on the soffit. Minor rehabilitation is required to Culvert 10, as well as patch repair at the outlet. These requirements shall be completed during detailed design.

It is recommended that the substrate of the structure match existing conditions as closely as possible to promote fish passage.

9.8.2 *Non-Structural Culverts*

There are seven non-structural culverts within the study area. **Table 9-4** outlines the required improvements to the non-structural culverts to address both hydraulics and to support the widened roadway.

Table 9-4: Recommended Improvements to Non-Structural Culverts

Culvert Identifier	Station	Material	Recommendation	Barrels (-)	New Length (m)	New Span (m)	New Rise (m)
C2	3+680	Concrete	Extend	1	43	1.2	1.2
C4	3+340	Concrete	Extend	1	59	0.6	1.2
C5	3+156	Concrete	Replace	2	40	0.75	0.6
C6	2+945	Concrete	Replace	1	39.3	0.75	0.75
C7	2+796	Concrete	Replace	2	49	0.75	0.75

Culvert Identifier	Station	Material	Recommendation	Barrels (-)	New Length (m)	New Span (m)	New Rise (m)
C9	2+347	Concrete	Replace	1	40	0.75	0.75
C11	1+075	Concrete	Extend	1	43	0.6	0.6

9.9 Streetscape Design

A 2.5 m green space is recommended between the travelled portion of the roadway and the MUP where feasible. The intention of the green space is to increase the safety of pedestrians and cyclists, enhance the visual appearance of the roadway and provide space for snow removal. In constrained areas, this green space has been reduced to alleviate property requirements.

All enhancement plantings within the green zone should be native or non-invasive, hardy, drought-tolerant species and be restricted to the road right-of-way. Plant selection for enhancement and infill planting should provide seasonal interest. Brampton's Landscape Development Guidelines (2019), shrubs, perennial plantings, and ornamental grasses and vines are generally discouraged in road buffers and may only be used in select locations with City approval.

As described in the Region of Peel's Road Characterization Study (2013) (addressed in Section 3.3.1.5), the green zone should consider a planting zone, splash strip and a utility zone. The 2.5-metre green space is not large enough to provide for the placement of trees, however, this space will serve to provide pervious areas as part of the stormwater management plan.

9.10 Construction Staging

The preferred design concept is to be implemented separately in the three roadway sections. In this way capacity can be added to the corridor as needed to accommodate the traffic demand and address identified corridor issues. An initial stage would include widening the southern section to 6 basic lanes with raised median from Highway 401 northerly to Steeles Avenue. Secondly, the section from 2 km south of Embleton Road to Embleton Road will be widened to 4 basic lanes with centre turning lane as an initial phase of the ultimate 6-lane construction. Thirdly, the section 2 km south of Embleton Road to Embleton Road will be widened to the complete 6 basic lanes, including centre turning lane were needed for access. Fourthly, the section from Steeles Avenue to 2 km south of Embleton Road will be widened to six basic lanes with centre turning lane were needed for access.

To reduce impact to existing properties in the segment between Steeles Avenue and 2 km south of Embleton Road, the preferred design concept includes a cross section with reduced features within an approximate 40-metre right-of-way. As redevelopment occurs within

Halton Region, property to accommodate a full widening of the cross section and right-of-way to a minimum 45-metre arterial road width is to be obtained through the development process.

9.10.1 Construction Phasing

The Region of Peel plans to construct the Winston Churchill Boulevard widening to 6 basic lanes according to the construction phasing plan described in **Table 9-5**.

Table 9-5: Construction Phasing

Segment	Detailed Design (start)	Land Acquisition (start)	Utility Relocations (start)	Construction (start)
Phase 2: Highway 401 to Steeles Avenue (4 to 6 lanes)	2023	2026	2027	2028
Phase 3: 2 km South of Embleton Road (Maple Lodge Farms) to Embleton Road (2 to 4 lanes)	2023	2026	2027	2028
Phase 4: 2 km South of Embleton Road (Maple Lodge Farms) to Embleton Road (4 to 6 lanes)	2030	2032	2033	2034
Phase 5: Steeles to 2 km South of Embleton Road (4 to 6 lanes)	2030	2032	2033	2034

It is recommended that the full property acquisition be completed prior to construction. The construction staging is based on the assumption that the residential properties along the corridor remain in the long-term. However, in the event that there is redevelopment, it is recommended that the full right-of-way width (22.5- to 25.13 metres each side of centerline) be acquired at that time to allow for the future construction of the full cross section design in midblock and intersection areas.

9.11 Access

The design as presented in the ESR made all reasonable efforts to provide full-movement access to all adjacent properties. However, in situations where safety concerns have been identified, such as in areas with driveway access close to existing and planned intersections, access has been restricted to right-in/right-out movement only.

All gravel driveways and residential entrances should be graded and compacted as required with new Granular A Base material. Paved residential entrances should be surfaced with 60 mm of HL1.

Further investigation and analysis should be completed for all commercial entrances to ensure reinstated pavements are adequate to support anticipated truck traffic.

To maintain accessibility to the employee parking lot and chicken shop at Maple Lodge Farms, the preferred design maintains the existing crossings at intersections and provides a MUP for pedestrians and cyclists. Additionally, the medians will be flush to allow for turning access to adjacent properties along the roadway.

9.12 Property

The initial widening from 2 km south of Embleton Road to Embleton Road to 4 basic lanes will require approximately 7,769.95 m² of property from the Region of Peel, and 3,604.20 m² from Halton Region. This property acquisition will also permit the subsequent widening of this same section to 6 lanes without further property acquisition.

Widening of the section from Steeles Avenue northerly to 2 km south of Embleton Road will require 3,875.67 m² from the Region of Peel (east side) and 2,980.42 m² from Halton Region (west side) of Winston Churchill Blvd. Property acquisition will be required to facilitate the proposed improvements. The Study reduces the property impacts to the extent possible, and while the acquisition of an entire property is not required, segments of the following commercial (3) and residential/agricultural (30) properties will be required:

- 16917 Steeles Ave W. – Commercial (Pride Truck Training)
- 2982 Steeles Ave. - Residential
- 7995 Winston Churchill Blvd. – Commercial (Amazon Fulfillment Centre)
- 8046 Winston Churchill Blvd. – Residential
- 8120 Winston Churchill Blvd. – Residential
- 8148 Winston Churchill Blvd. – Residential
- 8175 Winston Churchill Blvd. – Residential (Mount Zion Cemetery)
- 8182 Winston Churchill Blvd. – Residential
- 8194 Winston Churchill Blvd. – Residential
- 8195 Winston Churchill Blvd. – Residential
- 8214 Winston Churchill Blvd. – Residential
- 8232 Winston Churchill Blvd. – Residential
- 8246 Winston Churchill Blvd. – Residential
- 8252 Winston Churchill Blvd. – Residential / Agricultural
- 8301 Winston Churchill Blvd. – Commercial (Maple Lodge Factory)
- 8340 Winston Churchill Blvd. – Residential / Agricultural
- 8484 Winston Churchill Blvd. – Residential

- 8490 Winston Churchill Blvd. – Residential
- 8504 Winston Churchill Blvd. – Residential / Agricultural
- 8531 Winston Churchill Blvd. – Residential / Agricultural
- 8564 Winston Churchill Blvd. – Residential
- 8597 Winston Churchill Blvd. – Residential / Agricultural
- 8602 Winston Churchill Blvd. – Residential
- 8656 Winston Churchill Blvd. – Residential
- 8693 Winston Churchill Blvd. – Residential
- 8722 Winston Churchill Blvd. – Residential
- 8768 Winston Churchill Blvd. – Residential
- 8773 Winston Churchill Blvd. – Residential
- 8791 Winston Churchill Blvd. – Residential
- 8800 Winston Churchill Blvd. – Residential
- Unknown Address (PIN 140900149) – Residential / Agricultural
- Unknown Address (PIN 250260202) – Residential / Agricultural
- Unknown Address (PIN 250260211) – Residential / Agricultural

The property acquisition and permanent easement requirements for the preferred design are listed in **Table 9-6**.

Table 9-6: Property Impacts by Address

Jurisdiction	Address	PIN	Property Acquisition (m^2)	Permanent Easement Area (m^2)
Region of Peel	2982 Steeles Ave.	140900130	606.89	122.38
Region of Peel	7995 Winston Churchill Blvd.	140890570	18.59	N/A
Region of Peel		140900149	716.18	N/A
Region of Peel	8175 Winston Churchill Blvd.	140900059	606.89	N/A
Region of Peel	8195 Winston Churchill Blvd.	140900129	229.81	N/A
Region of Peel	8301 Winston Churchill Blvd.	140900151	1697.31	145.72
Region of Peel	8531 Winston Churchill Blvd.	140900142	2261.07	N/A
Region of Peel	8597 Winston Churchill Blvd.	140900047	142.92	6.6
Region of Peel	8693 Winston Churchill Blvd.	140900147	4291.26	N/A
Region of Peel	8773 Winston Churchill Blvd.	140900034	535.85	6.89
Region of Peel	8791 Winston Churchill Blvd.	140900033	538.85	N/A
Halton Region	16917 Steeles Ave W.	250260191	108.71	N/A
Halton Region	8046 Winston Churchill Blvd.	250260175	159.86	N/A
Halton Region	8120 Winston Churchill Blvd.	250260159	414.04	N/A
Halton Region	8148 Winston Churchill Blvd.	250260179	397.88	169.05
Halton Region	8182 Winston Churchill Blvd.	250260106	225.52	N/A
Halton Region	8194 Winston Churchill Blvd.	250260105	63.29	N/A
Halton Region	8214 Winston Churchill Blvd.	250260185	186.96	N/A
Halton Region	8232 Winston Churchill Blvd.	250260183	184.14	N/A
Halton Region	8246 Winston Churchill Blvd.	250260189	179.88	N/A
Halton Region	8252 Winston Churchill Blvd.	250260227	171.28	N/A
Halton Region	8340 Winston Churchill Blvd.	250260204	431.00	N/A
Halton Region		250260211	457.86	N/A

Jurisdiction	Address	PIN	Property Acquisition (m^2)	Permanent Easement Area (m^2)
Halton Region	8504 Winston Churchill Blvd.	250260165	745.05	150.00
Halton Region	8484 Winston Churchill Blvd.	250260173	173.52	N/A
Halton Region	8490 Winston Churchill Blvd.	250260169	168.42	N/A
Halton Region	8564 Winston Churchill Blvd.	250260181	327.35	N/A
Halton Region	8602 Winston Churchill Blvd.	250260177	333.12	N/A
Halton Region	8656 Winston Churchill Blvd.	250260187	1407.47	N/A
Halton Region	8722 Winston Churchill Blvd.	250260170	38.02	N/A
Halton Region	8768 Winston Churchill Blvd.	250260020	N/A	255.12
Halton Region	8800 Winston Churchill Blvd.	250260019	N/A	78.36
Halton Region		250260202	411.25	N/A

A property plan for each of the impacted properties has been prepared and is included in **Appendix P – Property and Cost**. As of the time of preparation of this ESR the Region of Peel and the Halton Region have met with some Property owners regarding property impacts.

9.13 Utilities

The utility companies contacted as part of the EA and relevant correspondence is included in **Appendix M**. Relocation of utilities is recommended if there are direct conflicts or if the construction of the roadway encroaches on any recommended clear zones. Consultation with affected utility companies is recommended early in the design phase to confirm locations and to establish relocation strategies.

Existing hydro poles and street light standards will be relocated to just beyond the limits of the MUP with a minimum 3 m buffer zone between the back of the hydro pole and the property line for a maintenance / work zone. It has been noted through comments from Alectra that a 5 m buffer is typically required for work zone around poles. This will be reviewed and additional property identified during detailed design, if the 5 m work zone is deemed necessary.

Appendix N includes the roll plan showing relocated hydro poles and streetlighting.

9.14 Illumination

Based on existing lighting which exists on both sides of the road including on hydro poles poles staggered with luminaires on the east side and illumination poles on the west side to

just north of Maple Lodge Farms, the recommendation is that illumination continue in this same layout extending up to Embleton Road.

Illumination will include luminaires on both sides of the road that will be mounted on either new street light standards (west side) or on existing hydro poles (east side). Illumination will be in a staggered layout to provide ample lighting along the corridor.

Appendix N includes the roll plan with relocated hydro poles and streetlighting.

A detailed lighting plan will be undertaken during detailed design.

9.15 Preliminary Cost Estimate

A preliminary construction cost estimate for Winston Churchill Boulevard is presented in **Table 9-7**, and a detailed breakdown is provided in **Appendix P**. The costs include all relevant roadway construction costs, and allowances for traffic signalization, illumination, utility relocations, structures (culverts and retaining walls) and property acquisition, where applicable.

Table 9-7: Proposed Construction Costs

Phase of Construction	Cost
Phase 2: Hwy. 401 to Steeles Avenue	
Total:	**$10,775,538***
Phase 3: 2 km S. of Embleton Rd. to Embleton Rd.	
Total:	**$16,821,656***
Phase 4: 2 km S. of Embleton Rd. to Embleton Rd.	
Total:	**$12,668,708***
Phase 5: Steeles Ave. to 2 km S. of Embleton Rd.	
Total:	**$15,475,369***
Project Total:	**$55,741,271**

*The above noted costs exclude property costs.

9.16 Preliminary Design Plates and Roll Plan

The Recommended Plan and Profile is included in **Appendix N**.

10. Proposed Mitigation and Commitment to Further Work

Mitigation measures to address negative effects have been applied throughout the EA process, including during the development of alignment alternatives and the selection of the preferred design concept. These measures were developed to achieve a balance of the natural, social, cultural and transportation factors evaluated during the EA to address existing and future needs along the Winston Churchill Boulevard. Some negative impacts cannot be completely avoided, therefore additional measures have been identified to be incorporated into the detailed design, construction and maintenance activities for the Project. A summary of the anticipated impacts and proposed mitigation measures and commitments is included in **Table 10-1.**

Table 10-1: Potential Environmental Impacts and Mitigation Measures for the Preferred Design Concept

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
Terrestrial Vegetation	Removal of vegetation will further fragment the communities and increase the risk of invasive plan species.	• A tree inventory and preservation plan should be developed during detailed design. • All equipment will be cleaned prior to arrival at the site to mitigate the potential spread of invasive species.	• Replanting trees in a nearby location where feasible.
	Clearing within the proposed construction footprint creates a risk of vegetation clearing/damage beyond the working area.	• Equipment should not be operated in areas where the contract does not require. • Tree removal will be restricted to the working area, and trees will be felled into the ROW.	• All disturbed areas will be restored immediately after construction is completed.
	Increased risk of the release of construction related sediment, spills and other materials into the vegetation and watercourses.	• A spill prevention and management plan should be developed during detailed design. • All equipment will be inspected prior to operation to identify any leakage or damage that could result in leakage.	N/A
	Removal of approximately 1,160m^2 of Cultural Thicket (CUT1) and Cultural Meadow (CUM1) communities east of Winston Churchill Blvd. along Levi Creek South Tributary.	• During detailed design review opportunities to reduce impact.	N/A
Wildlife	The loss of some treed and grassed areas will mean the removal of a small portion of wildlife habitat for a	• A Wildlife Management Plan shall be developed during detailed design.	• Additional studies to support detailed design will be completed to identify if hibernaculum are located within the

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
	variety of common species.	• The site shall be swept (by a qualified Ecologist) prior to each day to ensure no mammals or herpetofauna are found within the construction limits. • Exclusionary fencing shall be installed to eliminate access to the Study Area in advance of construction to prevent reptiles, amphibians, and some mammals from entering the site. • Workers shall be provided with training on how to identify species of conservation concern and safe handling procedures for relocating wildlife from the construction site. • A tree inventory and preservation plan should be developed during detailed design. • Tree removal can be mitigated by planting trees in a nearby location.	Project footprint. • Additional studies to be undertaken during detailed design will be completed to identify if hibernaculum are located within the Project footprint.
	Site clearing and grubbing during the construction phase of the project has the potential to destroy the nests, young birds and small mammals.	• A Wildlife Management Plan shall be developed during detailed design. • Workers shall be provided with training on how to identify species of conservation concern and safe handling procedures for relocating wildlife from the construction site.	• Nesting surveys will be conducted prior to construction commencement.
	Potential for increased mortality as a result of wildlife crossing the road during the operation phase.	• Investigate the potential for adding wildlife crossing signage. • Enforce speed limit which minimizes the	• Maintain areas which provide potential landscape linkage functions, such as Levi Creek North and Mullet Creek to support safe wildlife movement through the

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
		risk of wildlife mortality.	existing agricultural matrix.
	During the operation of the road, potential indirect impacts on wildlife as a result of light pollution (from vehicles and street lights).	• Lighting along the road should be designated to limit intrusion into the adjacent natural areas using shielding devices. • Street lighting should be of a design that limits incidental light cast.	• Illumination plan to be undertaken during detailed design.
	Potential impact to landscape connectivity and wildlife passage.	• Natural substrate should be installed with some cover to provide refuge to wildlife. • Medium sized stone should be placed along with smaller materials to fill interstitial spacing to attenuate seasonal flow through the feature.	• Examine opportunities to incorporate “crossing systems” where feasible and appropriate per CVC’s the Fish and Wildlife Crossing Guidelines (CVC, 2017) during detailed design. • Fencing placement and landscape design which facilitate passage should be included at detailed design.
Species at Risk	Adversely impact regulated Redside Dace spawning habitat.	• A project review by DFO will be required for the proposed works.	• Minimize work within the watercourse to minimize potential impact to Redside Dace
	Adversely impact potential Bobolink breeding habitat and risk of harming Bobolink during construction or disturbing species habitat (via increase noise, dust, human-species interaction, etc.).	• Construction and vegetation clearing to occur outside bird breeding window. • Additional surveys required to confirm suitable Bobolink habitat. • Removal of vegetation must not interfere with breeding bird activity (generally from mid-April to late-July). Where any proposed vegetation clearing during this timeframe, an ecologist should undertake detailed nest searches immediately prior (within 2 days)	• Construction and vegetation clearing to occur outside of bird breeding window. • Additional surveys may be required to confirm presence of suitable Bobolink habitat.

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
		to site alteration to ensure that no active nests are present.	
Watercourses / Wetlands	Potential to adversely impact the Levi Creek Wetland Complex (PSW) associated with Levi Creek North, as well as the three (3) watercourses within CVC regulation (via sedimentation caused by construction activities).	• Disturbance within the watercourse channel and wetlands should be minimized as much as possible. • An appropriate ESC plan should be developed and implemented for the Mullet Creek, Levi Creed South and Levi Creek North crossings and any other locations where the proposed construction activities are adjacent to a drainage feature or natural area. • Work should be undertaken during the summer low flow period. • Construction material, excess material, construction debris, and empty containers should be stored outside the creek floodplain. • A permit will likely be required under CVC's O. Reg. 160/06.	• Reduce impacts to watercourses, PSW and marsh areas associated with Levi Creek South and Mullet Creek, including the implementation of an Erosion and Sediment Control Plan. • A sediment control plan should be prepared for the construction phase of the developed and approved by CVC to the standard or Erosion and Sediment Control Guideline for Urban Construction [R]. • Develop plan during detailed design for ground improvements and in-water work for culvert extensions. • Fluvial Geomorphological assessment required during detailed design to address stream alterations within Levi Creek North.
Aesthetic / Visual	Improvement of the overall aesthetic of the roadway.	• Provide landscaping within green sections along the corridor where feasible, including between the roadway and the MUP.	N/A
Air Quality	Minimal impact to air quality, with overall GHG emissions being reduced in all areas except between Steeles Avenue and MLF where there is an increase of 6% in total	• Following best practices during construction as using equipment in good repair and machinery equipped with emission controls • The contractor will be required to limit and	N/A

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
	GHG emissions due to the Project.	control dust during construction. • Common dust suppression techniques to be employed during construction. • No formal mitigation for air quality is required, as impacts expected to be isolated to a small timeframe (during construction period)	
	Roadside Vegetation Barriers	• Consider roadside vegetation barriers close to Receptors 6 and 7.	The need for roadside vegetation barriers at R6 and R7 to be reviewed during detailed design.
Noise	Marginal increase of <3 dB[3] to current noise levels.	• During construction best practices will be followed and will abide by noise complain process and applicable noise by-laws. • No noise mitigation is recommended as the side and rear facing noise components are each OLA are below the City of Brampton daytime limit of 60 dBA.	N/A
Archaeology, Built Heritage and Cultural Heritage	Potential direct impacts to Mount Zion Cemetery / Whaley's Corners Cemetery, MLF Complex (CHL 2), Humphrey Farm (CHL 4) (8656 Winston Churchill Blvd. and 8768 Winston Churchill Blvd. (CHL 5) due to the features proximity to the road.	• Realigned roadway design to balance impact to properties on the east and west side and maintain a buffer area between the cemetery and construction footprint. • All efforts to be taken during detailed design to reduce impact to CHLs and BHRs. • Construction activities to be monitored by a	• Conduct a partial Stage 3 Archaeological Assessment to confirm whether any areas of cultural heritage value require Stage 4 excavation within the cemetery. • Conduct a cemetery investigation to confirm no burial features are present in the effected areas. • Implementation of an avoidance strategy including a temporary barrier to be

[3] Human perception threshold referenced in the City of Brampton Noise Attenuation Wall Policy Amendment – Retrofit Policy and Road Widening, The Corporation of the City of Brampton, April 2014.

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
		licensed archeologist. • Avoid laydown areas on CHL and BHR properties.	established along the interface between the protected area and the project limits during construction. • Preparation of a Heritage Impact Assessment to document direct impacts to BHRs and CHLs.
Residential / Commercial Properties	Residential property requirements may impact property value.	• Property purchase requirements to be minimized where possible. • Affected property owned have been contacted and will continue to be updated as throughout detailed design as the project progresses.	• Compensation for property purchase in accordance with the Region of Peel policy.
	Potential access issues during construction and changes to residential or commercial entrances.	• Coordinate infrastructure and access with premier Gateway Secondary Plan Phase 2B when possible to limit the overall duration of construction. • Access to existing residential and commercial properties will be maintained during construction.	• Traffic management plans will be implemented during construction to reduce congestion and maintain safe access to residential homes and commercial establishments.
	Property acquisition of lands with areas of potential environmental concern.	• Phase 1 ESA to be completed for areas of land to be acquired by Region of Peel.	• Completion of Phase 1 ESA prior to land acquisition by Region of Peel.
Safety / Access / Farm Vehicles	Impact to emergency vehicles during construction	• Provide advance warning to those on the Project contact list in advance of construction and advise of detours.	• Maintain communication during construction to keep the public, and agencies informed of potential delays / detours.
	Potential to impact farm vehicles	• Meet with local farmers during detailed to design to understand access during and	• Provide updates to local residents prior to construction to advise of detours

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
	during and following construction	following construction.	during construction.
Active Transportation	Increased use of active transportation.	• Consult with MTO / City of Mississauga on the requirements to connect MUP across Hwy 401 structure. • Ensure connectivity of sidewalk networks on west side between Highway 401 and Steeles Avenue. • Provide active transportation crossing opportunities at all legs of intersections.	• Conduct feasibility study of extending MUP across Hwy 401 structure (east side) and connecting to City of Mississauga facilities. • Implement cross rides with bicycle traffic signals at signalized intersections where feasible to increase the comfort, convenience, and safety of cyclists along the corridor. In detailed design consider implementation of a signalized cross ride at commuter parking lot intersection, to allow cyclists safe and comfortable access to the parking lot. • Step the stop-bars back from pedestrian crossings and cross rides at all intersections to improve sightlines. • Maintain 3.0 m clear space throughout entire multiuse path/trail in order to allow for adequate equipment to clear the multiuse path /trail in winter. Ensure that pinch points at intersections are avoided.
Public Transit	Potential to cause delays in transit during construction.	• Provide advance warning to City of Brampton in advance of construction to ensure transit maintained throughout and following construction.	• Incorporate bus stops, design features, and transit priority measures as required by transit providers. • Consult with City of Brampton regarding potential changes to transit along the corridor during detailed design.
	Congestion delays to public transit	• Provide transit priority measures in the	• During detailed design consider

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
	operating on the Frequent Rapid Transit Network	section from Steeles Avenue to south project limit	incorporation of transit priority measures including transit signal priority, queue jump and bypass lanes and bus stop relocation.
IO Property	Potential to impact Infrastructure Ontario property between Highway 401 and 407ETR	• During detailed design, Region of Peel / Halton Region to revisit property impact to determine opportunities for reduction	• Complete an IO EA during detailed design for the property to be acquired from the Province between Highway 401 E-N/S ramp and Meadowpine Boulevard.
	Access to 7870 WCB (north of 407) - Property currently vacant with no frontage on WCB, but has access via a service road owned by the Halton Region.	• As part of discussion with Safe Storage – review alternatives for a new access road parallel and west of Winston Churchill Blvd to provide full turning movement connecting in with the intersection with Orlando.	• Region to continue to maintain access to property via service road. • Region of Peel / Halton Region to revisit access during detailed design to determine opportunity for direct access off of Winston Churchill Blvd
MTO	Potential impact to MTO property near Highway 401 / 407 ETR	N/A	• During detailed design, review opportunities to reduce property impacts.
	Tie-in with Highway 413	• Coordination with MTO.	• Coordination with MTO during detailed design of Winston Churchill Blvd Class EA regarding lane configurations and tie-in points for future Highway 413 interchange. • Coordination with MTO/Brampton/Peel regarding the location of the Financial Drive intersection.
Stormwater Management	Post-development runoff for road catchments is expected to increase due to the increase in overall imperviousness coverage.	• Runoff resulting from major storms will be conveyed to the existing outlets • Minor drainage and overland flows will be collected by a series of catch basins and	• Stormwater management strategy was developed in consultation with CVC and will control quantity increases to pre-development conditions

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
		conveyed to the underground infiltration chambers with which are connected to the storm sewer network located under the median • Water quantity control via underground storage chambers • Water quality using oil grit separators and bioretention planters	• Hydraulic modelling to be completed during detailed design to assess impacts of road widening and structural design of three regulated watercourse crossings. • Stormwater management criteria shall meet all requirements of the Regional of Peel and Credit Valley Conservation Authority and additional criteria identified within this Study. • Detailed design of bioretention facilities and stormwater planters to be prepared during detailed design.
	Water Quantity Control – Maintenance of LID features	• Inspection ports at underground chambers	• During Detailed Design discussions with the Region's operations staff will be required for understanding and developing regular maintenance procedures of LID features.
	Stormwater CLI ECA 009-S701 conditions for alterations to the stormwater system	• At the time of completion of the EA study, the CLI ECA template and criteria were not available, therefore the EA recommendations for stormwater management do not guarantee compliance with the CLI ECA conditions and criteria	• At the Detailed Design Stage, the Engineering Consultant re-assess the EA recommendations against the CLI ECA criteria and make the necessary adjustments and changes to the stormwater recommendations to be in compliance.
Hydrogeological	Potential impact to groundwater	• Groundwater to be treated prior to direct discharge into surface water. • Prepare well monitoring program for private	N/A

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
	Potential impact to private wells	wells identified consisting of measuring the groundwater level and testing groundwater quality at each well.	
Water Services and Sewage	Potential impact to septic beds in front yard of impacted residential homes in close proximity to the ROW.	• Review property impacts during detailed design and identify opportunities to reduce impact on septic beds.	• Consider potential water servicing solutions during construction.
Municipal Infrastructure	Potential impact to watermain located along the west side of Winston Churchill Blvd, extending across the entire length of the road.	N/A	• Impacts to watermain to be reviewed during detailed design.
	Embleton Rd Eastbound Approach Configuration	• A separate eastbound left turn lane has been requested.	• The need for a separate eastbound left turn lane to be reviewed during detailed design based on updated traffic data.
Illumination	Lighting infrastructure to be impacted by proposed design.	• Light fixtures on existing hydro poles to be impacted by widening to be replaced outside of the ROW (up to Maple Lodge Farms), new light fixtures on new hydro poles to be confirmed during detailed design.	• Illumination Design to be completed to confirm location of poles along full length of corridor. • The need for lighting for the MUP on the west side of Winston Churchill Blvd from Steeles Avenue to Embleton/5 Sideroad to be reviewed during detailed design.
Hydro	Concerns regarding grade differentials (i.e., watercourse crossings), which may affect minimum span requirements.	N/A	• Potential impacts to minimum span requirements resulting from grade differentials will be addressed during detailed design.
	Potential adverse effects on existing utilities.	• Relocation or protection of utilities (where required).	• Impacts will be determined during detailed design. • Relocation of utilities as necessary for

Features	Potential Impact(s)	Mitigation Measures	Commitments To Future Work
			widening. • It has been noted through comments from Alectra that a 5 m buffer is typically required for work zone around poles. This will be reviewed and additional property identified during detailed design, if the 5 m work zone is deemed necessary.
	Opportunity to accommodate future utilities.	N/A	N/A
TransCanada Pipeline	Potential to impact the two high pressure natural gas pipelines that cross Winston Churchill Boulevard south of Highway 407.	• Avoid storing fill and/or building materials on pipeline ROW. • Limit paving to authorized crossing.	• Written approval from TransCanada to be received should grading affect ROW or drainage.

11. Permits and Approvals

Once the ESR has been through public review, the project can proceed to detailed design including obtaining all necessary permits and approvals. Agencies may request additional studies. The following agency approvals listed in **Table 11-1** are expected to be required for the implementation of the preferred design concept:

Table 11-1: Required Permits and Approvals for the Preferred Design Concept

Agency	Permits / Approvals
Ministry of the Environment, Conservation and Parks	Approvals of Sewage Works (ECA), Permit to Take Water / EASR (if required)
Department of Fisheries and Oceans	Request for Review
Ministry of Natural Resources and Forestry	Permit for Approval for Activities that may affect Species or Habitat protected under the *Endangered Species Act* Possible *Fisheries Act* Authorization
Credit Valley Conservation Authority	Planning permit application for development, interference with wetlands and alterations to shorelines and watercourses (pursuant to O. Reg. 160/06)

References

A Place to Grow: Growth Plan for the Greater Golden Horseshoe, Ministry of Municipal Affairs and Housing, Government of Ontario, 2020

Canada-Wide Standards of Particulate Matter and Ozone, Quebec City, Canadian Council of Ministers of the Environment, 2000.

City of Brampton Official Plan, City of Brampton, 2020

City of Brampton, Noise Attenuation Wall Policy Amendment – Retrofit Policy and Road Widening, April 2014.

Clean Water Act, S.O. 2006, c. 22, Ministry of Environment, Conservation and Parks, Government of Ontario, 2006

Considering climate change in the environmental assessment process, Ministry of the Environment, Conservation and Parks, Government of Ontario, 2017

Fish and Wildlife Crossing Guidelines, Credit Valley Conservation, 2017

Environmental Assessment Act, R.S.O. 1990, c. E. 19, Ministry of the Environment, Conservation and Parks, Government of Ontario, 1990

General Guidelines for the Preparation of Acoustical Reports in the Region of Peel, The Region of Peel, November 2012.

Greenbelt Plan, Ministry of Municipal Affairs and Housing, Government of Ontario, 2017

GTA West Transportation Corridor Route Planning, Preliminary Design and EA Study – Stage 2, Community Engagement Webinar (CEW-1-Presentation_Final.pdf (highway413.ca), GTA West Project Team, Ministry of Transportation, July 28, 2021

Halton Active Transportation Master Plan, Halton Region, 2016

Halton Region Official Plan, Halton Region, 2016

Halton-Peel Boundary Area Transportation Study, Region of Peel, Halton Region, City of Brampton, Town of Caledon and Town of Halton Hills, 2010

Impact Assessment Act, S.C. 2019, c. 28, s. 1, Impact Assessment Agency of Canada, Government of Canada, 2019

Let's Move Peel: Peel Long Range Transportation Plan 2019, Region of Peel, 2019

Local Air Quality Assessment, No. 14-0016, Novus Environmental, September 2016

Metrolinx 2041 Regional Transportation Plan for the Greater Toronto and Hamilton Area, Metrolinx, 2018

Stormwater Management Planning and Design Manual, Ministry of Natural Resources and Forestry, 2003

National Ambient Air Quality Objectives for Particulate Matter Part 1: Science Assessment Document, Health Canada, 1999.

Noise Abatement Guidelines – Regional Official Plan Guidelines, Halton Region, June 2014.

Noise Attenuation Wall Policy Amendment – Retrofit Policy and Road Widening, The Corporation of the City of Brampton, April 2014

Ontario's Ambient Air Quality Criteria, Ontario Publication 6570e, Standards Development Branch, Ontario Ministry of the Environment and Climate Change, 2008

Peel Region Goods Movement Strategic Plan 2017-2021, Region of Peel, 2017

Provincial Policy Statement, Ministry of Municipal Affairs and Housing, Government of Ontario, 2020

Region of Peel's Road Characterization Study, Region of Peel, 2013

Region of Peel Official Plan, Region of Peel, September 2021

Sustainable Transportation Study, Active Transportation Implementation Plan 2018-2022, Region of Peel, 2018

The Road to Change: Halton Region Transportation Master Plan 2031, Halton Region, 2011

Winston Churchill Blvd. Widening from Hwy 401 to Embleton Rd - Class Environmental Assessment Natural Environment Report, Beacon Environmental Limited, June 2022

Appendix A
Transportation and Traffic Study Report

Appendix B
Natural Heritage Report

Appendix C
Archaeological Assessment

- Stage 1 Archaeological Assessment
- Stage 2 Archaeological Assessment for the Mount Zion Cemetery

Appendix D
Cultural Heritage Assessment

Appendix E
Stormwater Management and Drainage Report

Appendix F
Fluvial Geomorphology Report

Appendix G
Geotechnical Report

Appendix H
Hydrogeological Report

Appendix I
Contamination Report

Appendix J
Foundations Report

Appendix K
Air Quality Assessment

Appendix L
Noise Impact Assessment

Appendix M
Consultation

Appendix N
Evaluation of Alternative Designs & Preferred Design

Appendix O
Structural Memo

- Inspection Reports
- 407 ETR and Culvert General Arrangements

Appendix P
Property and Cost