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BURLOAK DRIVE GRADE SEPARATION PROJECT
ENVIRONMENTAL PROJECT REPORT

VOLUME 1
MAIN REPORT

January 2018

AECOM Canada Ltd.

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Metrolinx

Burloak Drive Grade Separation Environmental Project Report

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Executive Summary

AECOM Canada Limited (AECOM) was retained by Metrolinx, an agency of the Province of Ontario, to undertake the Burloak Drive / Lakeshore West Rail Corridor Grade Separation Project (referred to herein as the Project), located in the City of Burlington and Town of Oakville, within Halton Region. The environmental effects of the Project have been assessed following the Transit Project Assessment Process (TPAP), as prescribed in *Ontario Regulation (O. Reg.) 231/08* under the *Environmental Assessment Act.* More information related to the study process is provided in **Section 1**.

ES1. Purpose of the Transit Project

The Lakeshore West Rail Corridor is one of GO Transit's seven (7) corridors within the Greater Toronto and Hamilton Area (GTHA). Every weekday, the corridor accommodates 90 GO train trips carrying a total of approximately 60,000 passengers. In order to accommodate the GO Expansion Program and the 30-minute off-peak service introduced in June 2013, train movements will continue to increase along the Lakeshore West Rail Corridor. As a result, this grade separation is required to support the increased train movements.

In addition, road/rail grade separations such as the one proposed at Burloak Drive serve to separate vehicles, pedestrians and cyclists from rail traffic, thereby improving:

- road travel speed and capacity, minimizing delays;
- rail on time performance and operational flexibility/reliability; and
- road and rail safety by reduced risk of collisions.

This is of primary importance for the rail crossing of Burloak Drive / Lakeshore West Rail Corridor, both of which accommodate high traffic volumes with plans for increased train volumes along the Lakeshore West Rail Corridor as part of the GO Expansion Program.

ES2. Project Description

The existing at-grade road/rail crossing consists of three (3) in-service mainline tracks and a 4-lane arterial road with associated sidewalks and/or multi-use paths.

The proposed Project will include:

- A new road-under-rail grade separation that provides:
  - A rail corridor that continues to include three (3) mainline tracks;
  - A 4-lane arterial road (Burloak Drive) that can ultimately provide up to six (6) traffic lanes;
  - Minor intersection enhancements at Harvester Road / Wyecroft Road and Superior Court / Prince William Drive;
  - Dedicated multi-use paths along the boulevards and on-street bicycle lanes;
  - Retaining walls; and
  - Future electrification provisions for Overhead Catenary System (OCS) pole bases and other electrification requirements, including grounding and bonding.
- Construction staging that provides:
  - Temporary re-routing of a section of Burloak Drive to the east;
  - Temporary diversion of a section of the Lakeshore West Rail Corridor tracks to the south;

- Relocation of the existing Burloak Interlocking Plant (switches between tracks) that is located just west of Burloak Drive; and
- Utility relocations to accommodate the design and construction staging of the proposed road-under-rail underpass

More information related to each of these aspects of the Project is provided in **Section 2**. The preliminary design is also provided in **Appendix A**.

ES3. Environmental Conditions and Effects

Environmental disciplines were assessed by practitioners using industry standard techniques and Metrolinx-specific protocols, where necessary. Discipline-specific environmental studies were undertaken to document the existing conditions for the following disciplines:

- Natural Environment;
- Geology and Groundwater
- Air Quality;
- Noise and Vibration;
- Socio-Economic and Land Use Characteristics;
- Cultural Heritage;
- Archaeology; and
- Traffic and Transportation.

Existing conditions information for each discipline is provided in **Section 3**.

An assessment and evaluation of the potential effects that the Project may have on the environment was completed for each aforementioned environmental discipline. Based on the findings of the technical studies and the effects evaluation, this Project is not anticipated to result in negative impacts on matters of provincial importance that relate to the natural environment, that have cultural heritage value or interest, or that negatively affect a constitutionally protected Aboriginal or treaty right. Mitigation measures have been proposed for the construction and operations phase for each environmental discipline.

The effects assessment, including potential effects, mitigation and monitoring during construction and operations, for each discipline is provided in **Section 4**. Each technical report is also provided in **Appendix B**.

Considerations related to climate change are provided in **Section 5**.

ES4. Summary of Consultation Activities

In accordance with Section 8 of *O. Reg. 231/08*, consultation activities were carried out with members of the public, property owners, review agencies, Indigenous communities, and other stakeholders during the course of the Project, including a summary of feedback and comments received.

The official Notice of Commencement of the TPAP was first issued to the public on November 23, 2017 through a variety of media (e.g., Project website, registered mail, postings at local libraries, social media).

As part of the public consultation undertaken for this Project, Metrolinx hosted two (2) Public Meetings, one (1) in March 2017 during the Pre-Planning activities and one (1) in December 2017 during the TPAP. These Public Meetings gave members of the public an opportunity to gather information about the Project, ask questions to the Project staff available at the meetings, and provide feedback.

Stakeholder consultation is summarized in **Section 6** and all record of consultation is provided in **Appendix C**.

ES5. Future Work and Project Implementation

Commitments to future work have been developed to satisfy the requirements of *O. Reg. 231/08*. Specifically the purpose of the commitments is to facilitate the implementation of the Project in accordance with the mitigation measures and monitoring activities described within and in a manner that minimizes or eliminates negative effects on the natural, socio-economics, cultural and transportation environments. In addition to the commitments to future work, permits and approvals obtained for the proposed works have been outlined and may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval will also be implemented.

A summary of all permits, approvals and future commitments is provided in **Section 7**.

Subject to environmental approval, construction of the Project is anticipated to take place in 2019.

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List of Acronyms

Acronym	Definition
AA	Archaeological Assessment
AADT	Average Annual Daily Traffic
AAQC	Ambient Air Quality Criteria
ANSI	Area of Natural and Scientific Interest
APTA	American Public Transportation Association
ASI	Archaeological Services Inc.
ASL	above sea level
ATR	Automatic Traffic Recorder
ATRIS	Aboriginal and Treaty Rights Information System
BHR	Built Heritage Resource
BVRA	Bronte Village Residents Association
CAAQs	Canadian Ambient Air Quality Standards
CAC	Criteria Air Contaminant
CEAA	Canadian Environmental Assessment Agency
CFIA	Canadian Food Inspection Agency
CHER	Cultural Heritage Evaluation Report
CHP	Conditional Heritage Property
CHR	Cultural Heritage Resource
CHSR	Cultural Heritage Screening Report
CN	Canadian National
CP	Canadian Pacific
CRA	commercial, recreational, or Aboriginal
CTFSG	Canadian Tire Financial Services Group
DBH	diameter at breast height
DFO	Fisheries and Oceans Canada
DRM	Design Reference Manual
EA	Environmental Assessment
EAB	Emerald Ash Borer
EASR	Environmental Activity and Sector Registry
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EMMP	Environmental Mitigation and Monitoring Plan
EPA	Environmental Protection Agency
EPR	Environmental Project Report
ESA	*Endangered Species Act*
ESA	Environmentally Significant Area
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic information system
GSC	Geological Survey of Canada
GTHA	Greater Toronto and Hamilton Area
HCM	Highway Capacity Manual
HONI	Hydro One Networks Inc.
HVA	Highly Vulnerable Aquifer
IBA	Important Bird and Biodiversity Area
INAC	Indigenous and Northern Affairs Canada
IPZ	Intake Protection Zone

Acronym	Definition
ISO	International Organization for Standardization
LIO	Lands Information Ontario
LOS	level of service
MBCA	*Migratory Bird Convention Act*
MDRP	Metrolinx Design Review Panel
MIRR	Ontario Ministry of Indigenous Relations and Reconciliation
MMAH	Ontario Ministry of Municipal Affairs and Housing
MNRF	Ontario Ministry of Natural Resources and Forestry
MOE	Ontario Ministry of the Environment
MOEE	Ontario Ministry of the Environment and Energy
MOECC	Ontario Ministry of the Environment and Climate Change
MTCS	Ontario Ministry of Tourism, Culture and Sport
MTO	Ontario Ministry of Transportation
NAPS	National Air Pollution Surveillance
NHIC	Natural Heritage Information Centre
O. Reg.	*Ontario Regulation*
OBBA	Ontario Breeding Birds Atlas
OCS	Overhead Catenary System
OGS	Ontario Geological Survey
OHA	*Ontario Heritage Act*
OHT	Ontario Heritage Trust
OPSS	Ontario Provincial Standards Specification
ORNAMENT	Ontario Road Noise Analysis Method for Environment and Transportation
PHP	Provincial Heritage Property
PPS	Provincial Policy Statement
PPV	Peak Particle Velocity
PTE	Permission to Enter
PTTW	Permit to Take Water
RMSV	Root Mean Square Velocity
ROW	right-of-way
SAR	Species at Risk
SARA	*Species at Risk Act*
SARO	Species at Risk in Ontario
SOCC	Species of Conservation Concern
SUE	subsurface utility engineering
SWH	Significant Wildlife Habitat
TAC	Technical Advisory Committee
TMC	Turning movement count
TNM	Traffic Noise Model
TNPI	Trans-Northern Pipelines Inc.
TPAP	Transit Project Assessment Process
QEW	Queen Elizabeth Way
US	United States
UTM	Universal Transverse Mercator
V/C	Volume/Capacity
ZOI	Zone of Influence

Units of Measure

Unit	Definition
cm	centimetres
dB	decibels
ha	hectares
hr	hour
Hz	hertz
km	kilometres
L/day	litres per day
Leq	equivalent continuous sound level
m	metres
mASL	metres above sea level
mbgs.	metres below ground surface
Mi.	mile marker
mm/s	millimetres per second
mm Dia.	millimetre diameter
vpd	vehicles per day
vph	vehicles per hour

1. Introduction and Study Process

1.1 Project Overview

AECOM Canada Limited (referred to herein as AECOM) was retained by Metrolinx, an agency of the Province of Ontario, to undertake the Burloak Drive / Lakeshore West Rail Corridor Grade Separation Project (referred to herein as the Project), located in the City of Burlington and Town of Oakville, within Halton Region. The environmental effects of the Project have been assessed following the Transit Project Assessment Process (TPAP), as prescribed in *Ontario Regulation (O. Reg.) 231/08* under the *Environmental Assessment Act.*

Metrolinx is implementing the GO Expansion Program (previously termed Regional Express Rail), which will provide new travel choices on the GO Transit network across the Greater Toronto and Hamilton Area (GTHA), including 15-minute service along the Lakeshore West Rail Corridor. This plan includes the grade separation of the Lakeshore West Rail Corridor at Burloak Drive to enhance safety, on time performance and operational flexibility/reliability in support of expanded rail service.

The existing at-grade road/rail crossing consists of three (3) in-service mainline tracks and a 4-lane arterial road with associated sidewalks and/or multi-use paths.

The proposed Project will include:

- A new road-under-rail grade separation that provides:
  - A rail corridor that continues to include three (3) mainline tracks;
  - A 4-lane arterial road (Burloak Drive) that can ultimately provide up to six (6) traffic lanes;
  - Minor intersection enhancements at Harvester Road / Wyecroft Road and Superior Court / Prince William Drive;
  - Dedicated multi-use paths along the boulevards and on-street bicycle lanes;
  - Retaining walls; and
  - Future electrification provisions for Overhead Catenary System (OCS) pole bases and other electrification requirements, including grounding and bonding.
- Construction staging that provides:
  - Temporary re-routing of a section of Burloak Drive to the east;
  - Temporary diversion of a section of the Lakeshore West Rail Corridor tracks to the south;
- Relocation of the existing Burloak Interlocking Plant (switches between tracks) that is located just west of Burloak Drive; and
- Utility relocations to accommodate the design and construction staging of the proposed road-under-rail underpass.

The Project Study Area is described in **Section 1.4**.

1.2 Planning Context and Other Projects

The Lakeshore West Rail Corridor extends from Union Station to Hamilton, passing through Toronto, Mississauga, Oakville and Burlington. The corridor comprises the Oakville Subdivision, owned by Metrolinx, and parts of Canadian Pacific (CP) Railway Hamilton subdivision and Canadian National (CN) Railway Grimsby subdivision. Burloak Drive is under the joint jurisdiction of the City of Burlington and Town of Oakville south of the Harvester Road/Wyecroft Road intersection. North of that intersection, the jurisdiction is with Halton Region. The proposed grade separation is located within joint City of Burlington and Town of Oakville jurisdiction. Metrolinx is the proponent of the Project and is working in conjunction with the adjoining municipalities (City of Burlington and Town of Oakville) to adhere to requirements of all three (3) parties, where possible and feasible.

Electrification of the Lakeshore West Rail Corridor is being addressed in a separate GO Rail Network Electrification TPAP. Construction of the Project is anticipated to occur from 2019 through 2022 in co-ordination with the electrification of this segment of the Lakeshore West Rail Corridor. Electrification-related construction will extend beyond 2022.

1.3 Purpose of the Transit Project

The Lakeshore West Rail Corridor is one of GO Transit's seven (7) corridors within the GTHA. Every weekday, the corridor accommodates 90 GO train trips carrying a total of approximately 60,000 passengers. In order to accommodate the GO Expansion Program and the 30-minute off-peak service introduced in June 2013, train movements will continue to increase along the Lakeshore West Rail Corridor. As a result, this grade separation is required to support the increased train movements.

In addition, road / rail grade separations such as the one proposed at Burloak Drive serve to separate vehicles, pedestrians and cyclists from rail traffic, thereby improving:

- road travel speed and capacity, minimizing delays;
- rail on time performance and operational flexibility/reliability; and
- road and rail safety by reduced risk of collisions.

This is of primary importance for the rail crossing of Burloak Drive / Lakeshore West Rail Corridor, both of which accommodate high traffic volumes with plans for increased train volumes along the Lakeshore West Rail Corridor as part of the GO Expansion Program.

Additionally, Metrolinx completed a network study to identify ten (10) priority road-rail crossings to be grade separated. A total of 185 road-rail crossings were reviewed, and the crossing at Burloak Drive was identified as one (1) of the ten (10) priority road-rail crossings to be grade separated.

1.4 Description of the Study Area

The Project Study Area (referred to herein as the Study Area) is comprised of a corridor that runs along the Lakeshore West Rail Corridor from Mi. 26.50 to Mi. 27.30, and along Burloak Drive from the Harvester Road / Wyecroft Road intersection to the north and Prince William Drive / Superior Court intersection to the south. The Study Area extends approximately 30 metres (m) on either side of both the Burloak Drive road platform and the Lakeshore West Rail Corridor in order to encompass the full length of the proposed road-under-rail grade separation design and the construction staging described in **Section 1.1**. The Study Area is illustrated on **Figure 1-1**.

Figure 1-1: Burloak Drive Grade Separation Project Study Area

In order to complete discipline-specific environmental and technical studies required for this TPAP, the Study Area also extends beyond the existing Lakeshore West Rail Corridor right-of-way (ROW) between the west and east boundary to account for environmental features that may be potentially affected by the proposed Project (i.e., the Assessment Area). The discipline specific Assessment Areas required for environmental investigations and technical reports are outlined in **Table 1-1**, and the rationales for these Assessment Areas are provided in the associated discipline reports (**Appendix B1** to **Appendix B8**).

Table 1-1: Assessment Areas by Discipline

Discipline	Assessment Area
Natural Environment	The Natural Environment Assessment Area is defined as extending 500 m from the Study Area.
Air Quality	The Air Quality Assessment Area is defined as extending approximately 500 m on the west side of Burloak Drive and approximately 800 m on the east side of Burloak Drive.
Noise and Vibration	The Noise and Vibration Assessment Area is defined as extending 230 m from the commuter rail mainline or 490 m from the rail station or crossings with horns and bells.
Socio-Economic and Land Use Characteristics	The Socio-Economic and Land Use Characteristics Assessment Area is defined as extending 300 m from the Study Area.

Table 1-1: Assessment Areas by Discipline

Discipline	Assessment Area
Traffic	The Traffic Assessment Area is comprised of the ROW on Burloak Drive between the Highway 403 / Queen Elizabeth Way (QEW) eastbound off-ramp / Red Oak Boulevard to the north and Michigan Drive / Great Lakes Boulevard to the south. The Traffic Assessment Area extends approximately 30 m on either side of the edge of the Burloak Drive ROW to include portions of the following key roads: • Burloak Drive • Red Oak Boulevard • Great Lakes Boulevard • Highway 403/ QEW eastbound off-ramp • Harvester Road / Wyecroft Road • Michigan Drive • Prince William Drive/Superior Court
Cultural Heritage	The Cultural Heritage Assessment Area is defined as extending 30 m from the Study Area.
Archaeology	The Archaeology Study Area is defined as extending 30 m from the Study Area.

1.5 Transit Project Assessment Process (TPAP)

This Environmental Project Report (EPR) was prepared in accordance with *O. Reg. 231/08, Transit Projects and Metrolinx Undertakings* (Transit Projects Regulation). The TPAP is a proponent-driven, self-assessment process that provides a defined framework for the proponent to follow to accelerate assessment and decision-making surrounding potential environmental effects for a selected project. The assessment and decision-making are undertaken within a maximum 120-day regulated assessment timeline followed by a 30-day public and agency review and a 35-day review by the Ministry of the Environment and Climate Change (MOECC) (i.e., the Minister).

Proponents are encouraged to undertake preliminary investigations and consultation through Pre-Planning activities prior to the commencement of the TPAP. Following completion of the Pre-Planning activities, the proponent initiates the TPAP by issuing a Notice of Commencement. It is at this point that the regulated 120-day timeframe commences.

The prescribed steps of the TPAP are outlined in **Figure 1-2**.

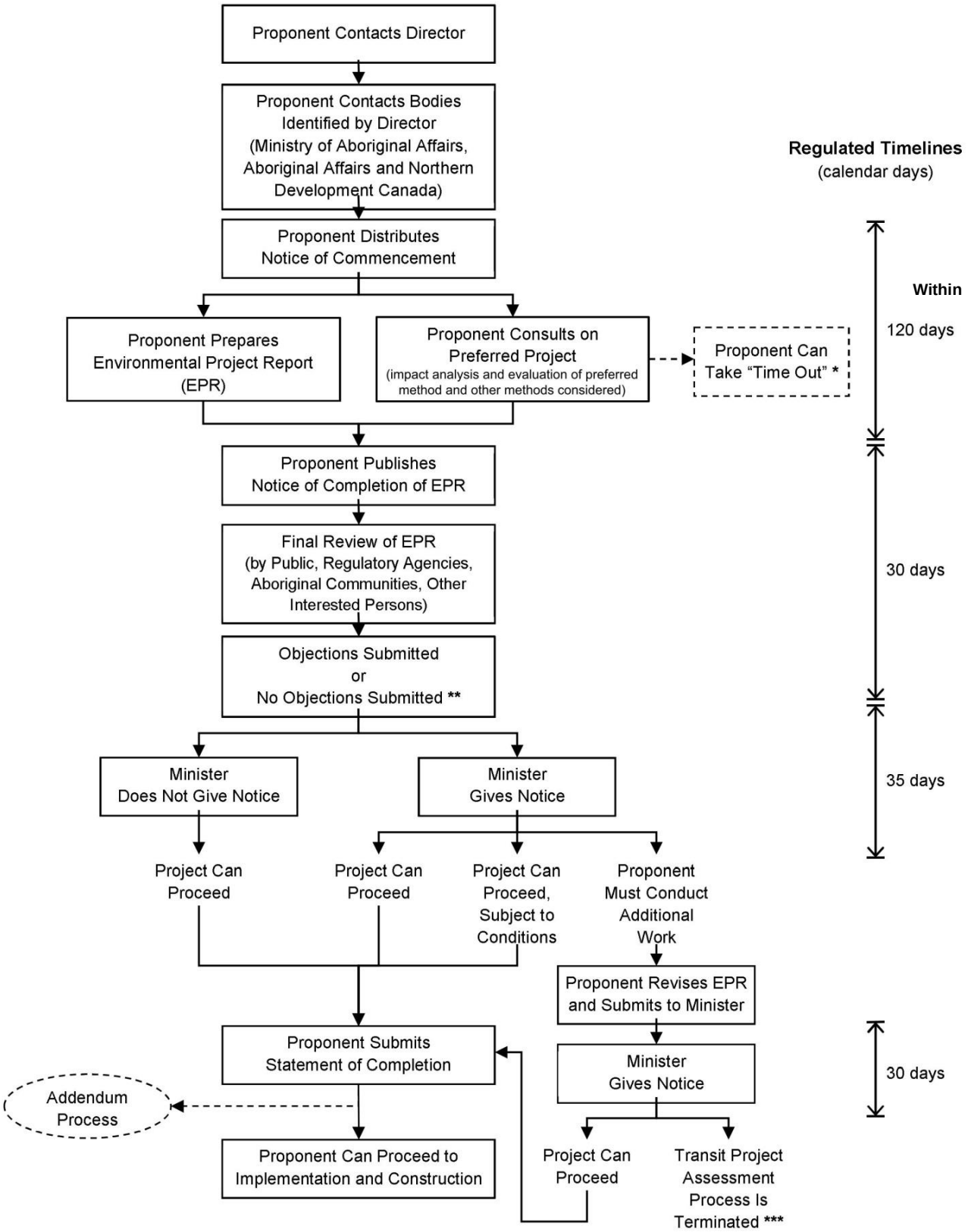
1.5.1 Previous Municipal Class Environmental Assessment (EA)

A Municipal Class Environmental Assessment (EA) (1994) was completed by the Town of Oakville and the City of Burlington to assess the road widening of Burloak Drive and provisions for a grade separation. The Class EA recommended a road under rail grade separation at the rail crossing with the provision to ultimately have a 6-lane wide road, which also included the widening and realignment of Burloak Drive north of Rebecca Street. While this was the preferred alternative of the study, due to the amount of time that has passed since its completion, the EA findings as they relate to the environmental technical disciplines addressed in the 1994 EA warrant updating. Therefore, it was decided to initiate a TPAP in accordance with *O. Reg. 231/08*.

1.5.2 Pre-Planning Activities

In preparation for the official commencement of a TPAP (via a Notice of Commencement; see **Figure 1-2**), a number of ‘Pre-Planning activities‘ are undertaken in order to provide a better understanding of Project context prior to commencing the TPAP. The Pre-Planning activities for this Project are described below.

Figure 1-2: Transit Project Assessment Process



1.5.2.1 Feasibility Study

A feasibility study, titled the *Burloak Dr. Grade Separation Feasibility Study*, was completed by AECOM in 2017. This study assessed alternatives based on the three (3) main line tracks of the Lakeshore West Rail Corridor and the four (4) traffic lanes on Burloak Drive. The alternatives were evaluated for technical feasibility, constructability, land use and environment, schedule and cost. Based on the evaluation of the alternatives and consultation with stakeholders, a preferred option was identified (i.e., road-under-rail conventional underpass structure). This EPR builds upon the *Burloak Dr. Grade Separation Final Feasibility Study* (AECOM, 2017).

On February 2, 2017, towards the end of the Feasibility Study, Metrolinx was advised by the City of Burlington and Town of Oakville to finalize the Feasibility Study based on a preferred road platform cross-section. Based on feedback from key stakeholders combined with the outcome of the Feasibility Study, it was determined in August 2017 that the Project would be delivered as a 4-lane road-under-rail grade separation with the structure opening capable of ultimately providing six (6) lanes.

1.5.2.2 Description of Existing Environmental Conditions

The existing environmental conditions within the Study Area and within discipline-specific environmental Assessment Areas were established as part of the Pre-Planning activities through a combination of desktop review and field studies. Each of the primary environmental disciplines was assessed by practitioners using industry standard techniques and Metrolinx-specific protocols, where necessary. Discipline-specific environmental studies were undertaken to document the existing conditions for the following disciplines:

- Natural Environment;
- Geology and Groundwater;
- Air Quality;
- Noise and Vibration;
- Socio-Economic and Land Use Characteristics;
- Cultural Heritage;
- Archaeology; and
- Traffic and Transportation.

1.5.2.3 Public and Stakeholder Consultation

Consultation for this Project occurred in two (2) main stages:

- Prior to the Notice of Commencement for the TPAP (including release of the Draft EPR for technical agency review); and
- Following the Notice of Commencement of the TPAP.

To build strong relationships, to develop a complete understanding of local issues in the surrounding communities, and to ensure communities stayed engaged and informed, Metrolinx consulted with the public and a range of stakeholders prior to officially commencing the TPAP. The consultation program followed by Metrolinx for this Project is further detailed in **Section 6** and consultation materials are included in **Appendix C**.

Consultation during the Pre-Planning activities was conducted to inform and solicit feedback or information from Indigenous communities, technical review agencies, the City of Burlington, the Town of Oakville, Halton Region, Halton Region Conservation Authority (also known as Conservation Halton), utility companies, local community groups, local businesses, and elected officials of the Project.

Metrolinx implemented a Project Communications and Stakeholder Consultation Plan (**Appendix C**) that includes web-based information, e-mail communications, proactive outreach to community groups, contact with Indigenous communities, and public meetings.

Public Meetings and focused stakeholder specific meetings provided an opportunity for stakeholders to speak directly with the Project Team, and allowed Metrolinx to introduce the Project and garner comments on:

- The description of existing environmental conditions within the Study Area;
- The potential environmental effects of the Project; and
- Recommended mitigation and monitoring measures to address environmental effects.

During the Pre-Planning activities prior to the TPAP, one (1) Public Meeting was held in March 2017. A second Public Meeting was held following TPAP commencement in December 2017. Notification of these Public Meetings was provided through the Project Website (www.metrolinx.com/burloak), local newspaper advertisements, social media and mailings and/or e-mails to technical review agencies, identified stakeholder groups, and Indigenous communities. Further information on consultation can be found in **Section 6**.

1.5.3 Key Steps of the Transit Project Assessment Process (TPAP)

The TPAP defines the following series of steps (see **Figure 1-2**) to be undertaken by the proponent that allows the process to be completed within approximately six (6) months:

- Contact the MOECC to help identify Indigenous communities that may be interested in the Project;
- Issue a Notice of Commencement of the TPAP;
- Assess environmental effects, develop mitigation, and consult with the public and other stakeholders;
- Issue a Notice of Completion of the EPR (within 120 days of the Notice of Commencement);
- Provide 30 days for the public, review agencies, Indigenous communities and other interested persons to review the EPR;
- Provide 35 days for the Minister of the Environment and Climate Change to review the EPR; and
- Submit a Statement of Completion.

O. Reg. 231/08 provides a process by which the proponent may take a 'time out' during the 120-day TPAP consultation and documentation process. This may be used only when issues arise during the 120-day period concerning a potential negative impact on a matter of provincial importance that relates to the natural environment or has cultural or heritage value or interest, or a constitutionally protected Aboriginal (Indigenous) or treaty right. If a time out is taken, notice of this must be provided to the Director and Regional Director of the MOECC and posted on the Project Website. Once the issue has been addressed, the proponent may resume the TPAP by notifying the Director and Regional Director of the MOECC.

1.6 Environmental Project Report (EPR) Organization

The documentation of the TPAP, as provided in this EPR, shall be submitted to MOECC and filed for public review within 120 days of publishing the Notice of Commencement. This EPR documents the existing environmental conditions within the Study Area, the potential environmental effects of the Project, recommended mitigation measures and monitoring, the consultation process followed, and future commitments for the Project.

Table 1-2 below summarizes the information that is required to be included in the EPR as applicable to this Project, as specified in pages 33-34 of the *Guide to Environmental Assessment Requirements for Transit Projects* (MOECC, 2014), and the associated section of this EPR where it has been addressed.

Table 1-2: Summary of EPR Requirements

EPR Requirement	Section of EPR
A statement of the purpose of the transit project and a summary of any background information relating to the Project.	Section 1
A final description of the transit project including a description of the preferred design method.	Section 2
A map showing the site of the transit project.	Section 1
A description of the local environmental conditions at the site of the transit project.	Section 3
A description of all studies carried out, including a summary of all data collected or reviewed and a summary of all results and conclusions.	Sections 3 and 4
The assessments, evaluation and criteria for any impacts of the preferred design method and any other design methods that were considered once the project's transit project assessment process commenced.	Section 4
A description of any proposed measures for mitigating any negative impacts the transit project might have on the environment.	Section 4
If mitigation measures are proposed, a description of the proposal for monitoring or verifying the effectiveness of the mitigation measures.	Sections 4 and 7
A description of any municipal, provincial, federal, or other approvals or permits that may be required.	Sections 4 and 7
A consultation record.	Section 6

1.7 Objection Process, Minister's Review and Statement of Completion

The submission of this EPR and the issuance of the Notice of Completion triggers the 30-day public review period. During this time, if members of the public, regulatory agencies, Indigenous communities, or other interested persons have concerns about this transit project, objections can be submitted to the Minister. After the 30-day review period has ended, any objections received will not be considered, and the Minister has 35 days within which certain authority may be exercised.

Persons wishing to submit an objection for consideration by the Minister should provide the following information:

- Name, mailing address, organization or affiliation (where applicable), daytime telephone number, e-mail address (where possible);
- Contact details of the proponent including name, address and telephone number;
- Brief description of the proponent's proposed undertaking;
- Basis for why further study is required, including identification of any negative impacts concerning a matter of provincial importance that relates to the natural environment or has cultural or heritage value or interest, or a constitutionally protected Aboriginal (Indigenous) or treaty right that was not identified in the proponent's EPR; and
- Summary of how the person(s) objecting have participated in the Project's consultation process.

Whether or not there is public objection, the Minister may act within the 35-day period to issue one (1) of the following three (3) notices to the proponent:

- Notice to Proceed with the planned transit project as documented in its EPR;
- Notice that requires the proponent to take further steps, which may include further study or consultation; or,
- Notice allowing the proponent to proceed with the transit project subject to conditions.

The Minister may give notice allowing the proponent to proceed with its transit project but, under TPAP, can only take action if there is potential for a negative impact on a matter of provincial importance that relates to the natural

environment or has cultural heritage value or interest, or a constitutionally protected Aboriginal (Indigenous) or treaty right. If the Minister issues a notice to proceed with the transit project as planned, or does not act within the 35-day period, Metrolinx shall issue a Statement of Completion and proceed to implementation. The Statement of Completion will indicate that Metrolinx intends to proceed with the transit project in accordance with either:

- The EPR;
- The EPR subject to conditions set out by the Minister; or,
- The Revised EPR.

The construction or implementation of the transit project subject to the TPAP cannot begin until the requirements of the process have been satisfied.

1.8 Addendum Process

The Project presented in this EPR is not a static plan, nor is the context in which it is being assessed, reviewed, approved, constructed, and used. Given the potential for changes to the Project resulting from the approvals, detailed design, and construction processes, it is prudent to include in the EPR a description of the responsibilities of the proponent should changes be required in the Project following Statement of Completion.

This EPR identifies the impacts associated with the Project, and the property envelope within which the Project can feasibly be constructed. The actual layout of Project elements (as described in **Section 1.1**) are subject to detailed design and any variation from that shown in this EPR, unless it results in an environmental impact which cannot be accommodated within the committed mitigation measures, does not require additional approval under *O. Reg. 231/08.*

The TPAP includes provisions (in Section 15 of the Regulation) for proponents to make changes to a transit project after the Statement of Completion is submitted to the Director of the Environmental Assessment and Approvals Branch of the MOECC and the MOECC Regional Director.

In compliance with Section 15(1) of the Regulation, Metrolinx shall prepare an addendum to the EPR if there is a proposed change to the Project that is inconsistent with the EPR after the Statement of Completion is issued. A change that is inconsistent with the EPR is generally defined as one for which the effects have not been accounted for in the EPR, either directly or through a contingency planning approach in which a worst case scenario has been contemplated and a protocol for addressing change has been included in the EPR. If the proposed change would result in a lesser impact than planned for and meets the mitigation intents identified in the EPR, it may be deemed to be consistent with the EPR and therefore no addendum is required. Changes to the Project may also be required if there is a significant lapse of time (i.e., ten (10) years) between the Statement of Completion and the start of construction, which will require a formal review of the Project by Metrolinx in consultation with relevant stakeholders (in accordance with Section 16 of the Regulation).

If changes to the Project indicate that an EPR addendum is required, it must include the following information:

- A description of the proposed change;
- The reason for the proposed change;
- An assessment and evaluation of any impacts that the proposed change might have on the environment;
- A description of any proposed measure for mitigating any negative impacts that the proposed change might have on the environment; and
- A statement of whether the proponent is of the opinion that the proposed change is significant (or not), and the reasons for the opinion.

2. Project Description

The preliminary design of the Project is provided in **Appendix A**. As indicated in **Section 1.1**, the proposed Project will include:

- A new road-under-rail grade separation that provides:
  - A rail corridor that continues to include three (3) mainline tracks;
  - A 4-lane arterial road (Burloak Drive) that can ultimately provide up to six (6) traffic lanes;
  - Minor intersection enhancements at Harvester Road / Wyecroft Road and Superior Court / Prince William Drive;
  - Dedicated multi-use paths along the boulevards and on-street bicycle lanes;
  - Retaining walls; and
  - Future electrification provisions for OCS pole bases and other electrification requirements, including grounding and bonding.
- Construction staging that provides:
  - Temporary re-routing of a section of Burloak Drive to the east;
  - Temporary diversion of a section of the Lakeshore West Rail Corridor tracks to the south;
- Relocation of the existing Burloak Interlocking Plant (switches between tracks) that is located just west of Burloak Drive; and
- Utility relocations to accommodate the design and construction staging of the proposed road-under-rail underpass.

2.1 Preliminary Design Elements

In order to accommodate the Project components discussed above, several key constraints were assessed during the development of the design. The constraints were assessed in consultation with the Metrolinx Design Reference Manual (DRM) and relevant Town of Oakville and City of Burlington road design standards and include:

- The existing Lakeshore West Rail Corridor track configuration, and the planned improvements to rail service operations and speeds;
- The existing Burloak Drive cross-section and intersections design, and the planned widening to six (6) lanes with associated multi-use paths and bicycle lanes;
- Study Area topography;
- Existing nearby bridge structures and Burloak Interlocking Plant (switches between tracks) within the Lakeshore West Rail Corridor; and
- The desire to minimize potential property and environmental impacts.

Descriptions of all the design elements that comprise the Project components are provided in **Table 2-1**. Additional detailed descriptions for the grade separation/bridge, temporary track diversion, temporary road detour, relocation of utilities, and property impacts are provided in the sections following **Table 2-1**. The 30% preliminary design drawings, road detour and track diversion drawings, and conceptual renderings are provided in **Appendix A**. Refinements to Project design (within the footprint of the Study Area) shall occur during detailed design, along with any associated technical studies to assess potential impacts, where required.

Table 2-1: Grade Separation Design Elements

Design Elements	Description
Grade Separation Type	• Road-under-rail conventional underpass structure.
Bridge Type	• Two (2) span rail carrying structure (38.5 m total length), utilizing precast concrete box girders (1.54 m depth), founded on spread (shallow) footings. Vertical clearance of 5.3 m over road provided.
Rail	• Three (3) mainline ballasted tracks over the structure. Permanent relocation of the existing Burloak Interlocking Plant.
Future Electrification	• OCS pole foundation for future electrification, including grounding and bonding.
Road	• Arterial 6-lane road, 3.0 m multi-use paths on both sides, 1.5 m combined shoulder/bike lane on both sides, and a maximum 5.0 m median.
Construction Staging	• Temporary road rerouting and rail diversion required for in situ construction. Full road closure for two (2) 4-week periods.
Utilities	• All utilities in road corridor (sewers, hydro, and communication) to be permanently relocated prior to construction of rail detour.
Drainage	• Underpass drainage to be conveyed and connected to existing storm sewer system tie in point located between Flora Drive and Adele Road.
Property	• Temporary property easements required for the short section of 4-lane road rerouting to the east of Burloak Drive, and three-track diversion to the south. • Permanent property acquisitions are not anticipated.
Environmental	• Sheldon Creek East to be protected from erosion and sediment during construction of track diversion. • Loss of hedgerow due to track diversion. Mitigation to be provided. • Loss/adjustment of existing entrances from Burloak Drive due to retaining walls. Mitigation to be provided.

Grade Separation and Bridge

A 4-lane arterial road-under-rail grade separation (conventional underpass structure) will be constructed at the existing at-grade crossing with the structure opening capable of ultimately providing six (6) lanes. The construction will also include retaining walls, provisions for electrification, on-road bike lanes, and two (2) multi-use paths. The existing Burloak Drive may be widened from the existing 4-lane configuration to a 6-lane configuration between the Harvester Road / Wyecroft Road and Prince William Drive / Superior Court intersections.

Temporary Diversion of Tracks

To accommodate the construction of the road-under-rail grade separation structure, the three (3) existing mainline tracks over the existing at-grade road crossing must be temporarily diverted in order to maintain regular rail operations throughout the duration of construction of the grade separation structure. Due to site restrictions on the north side of the existing railway corridor, the temporary track diversions will be located on the south side of the existing tracks. The detour of all three (3) tracks begins approximately 450 m to the east and to the west of Burloak Drive, and will accommodate passenger and freight traffic at reduced operational speeds. This track detour arrangement provides the shortest impact to the existing tracks and avoids impacting the two (2) watercourses and existing railway bridges (Sheldon Creek East-Mi. 26.71 and Sheldon Creek-Mi. 27.45) and excludes any modifications to the Suncor Spur Track.

Temporary Road Detour

In order to install the three (3) track diversion and construct the underpass, two (2) 4-week closures of Burloak Drive are required. A temporary road detour is proposed to maintain traffic on Burloak Drive once the temporary track diversion is in place. During construction, a temporary transit shuttle service will be provided in the Town of Oakville during the full road closures. The detour will accommodate the existing road platform and will be located on the east side of the crossing. Temporary at-grade road crossing protection will be provided.

Relocation of Utilities

All utilities within the Burloak Drive ROW will be relocated in advance of the grade separation construction (sewers, hydro, natural gas, and communication). The only exception is the Halton Region watermain, which is approximately 29 m below grade and will not be impacted by the construction of the underpass. In addition to the third-party and municipal utilities, the existing signal, power and communication cabling within the rail corridor will be protected and relocated as required to facilitate the construction of the temporary track diversion and proposed grade separation underpass. The existing overhead hydro lines that run parallel to Burloak Drive on both the east and west sides will also require relocation.

The existing Trans-Northern Pipelines Inc. (TNPI) oil pipeline located south of the existing at-grade crossing will be protected during construction as it does not require relocation.

Property Impacts

The three (3) track diversion will require temporary easements; however, no property acquisitions are anticipated for construction. Depending on the proposed utility relocations, additional property may be required (takings or permanent easements).

There are three (3) properties directly adjacent to the existing at-grade crossing in the northeast, southwest, and southeast quadrants. These properties are privately owned and are expected to either be privately sold or developed in the near future. During construction and operations, access to these properties shall be provided via the surrounding road network. Refer to **Section 4.6.4.1** for details related to temporary property impacts during construction and operation as a result of the road detour and road widening. Refer to **Section 4.6.4.2** for detailed information relating to alternate access points during construction and operation.

Sidewalk and Cycling Facility Connectivity

During construction, the existing multi-use path connection leading from the sports facilities on the west side of Burloak Drive will be detoured to connect with the proposed temporary multi-use path adjacent to the temporary road detour on the east side of Burloak Drive. Once construction of the underpass and associated road has been completed, restoration of the existing connection to the new multi-use pathway and on-road bike lanes will be completed.

3. Existing Conditions

This section of the EPR describes the existing natural, socio-economic and cultural environments present within the Study Area in the context of the Project. The purpose of characterizing the existing environmental conditions is to establish a baseline condition to use for the assessment of potential effects and proposed mitigation measures, described in **Section 4**.

Information on the following components is presented in the sections below and where applicable is supplemented with supporting detailed technical reports provided in **Appendix B**:

- Natural Environment;
- Geology and Groundwater
- Air Quality;
- Noise and Vibration;
- Socio-Economic and Land Use and Characteristics;
- Cultural Environment; and
- Traffic and Transportation.

3.1 Natural Environment

A Natural Environment Report (**Appendix B1**) was completed to document existing natural features, provide an assessment of their significance and sensitivity to the proposed construction and operation of the Project, outline potential environmental effects and mitigating measures to minimize impacts, identify anticipated future project permitting needs and inform the preparation of the natural environment components of the TPAP.

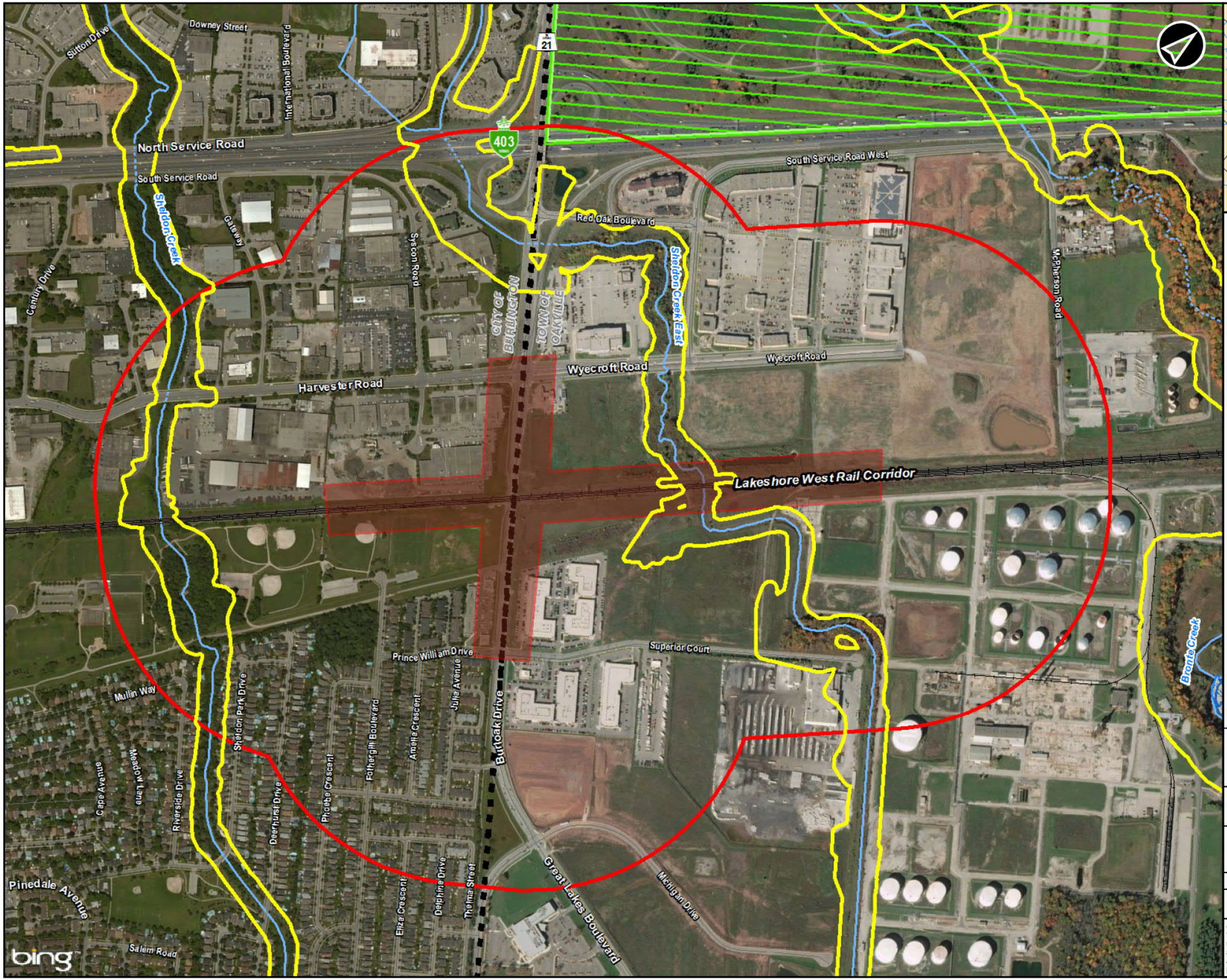
The existing terrestrial and aquatic natural environment conditions were determined through a combination of desktop background literature reviews as well as field investigations, conducted in 2016 and 2017. The methods and results of these are further described below.

3.1.1 Methodology

Natural heritage features were identified based on information obtained from a variety of sources, including the Ministry of Natural Resources and Forestry (MNRF) online databases, mapping data, and correspondence, municipalities, Conservation Halton correspondence and data provided, wildlife atlases, and other relevant background documents. The Natural Environment Assessment Area is as defined in **Table 1-1**. The natural features within the Assessment Area are illustrated in **Figure 3-1**. Refer to the Natural Environment Report in **Appendix B1** for a comprehensive description of methodology.

Several field investigations were completed within the appropriate season in 2016 to assess the various components of the terrestrial and aquatic ecosystems, as identified through the background review that may potentially be affected by the Project. These included the following surveys:

- Ecological land classification (ELC) surveys;
- Vascular plant surveys;
- Tree inventory and assessment;
- Anuran call surveys;
- Breeding bird surveys;
- Bat cavity survey;
- Significant Wildlife Habitat (SWH) assessments;
- Aquatic habitat assessments; and
- Fish community assessments.



Legend

- Study Area
- Natural Environment Assessment Area (500m)
- Permanent Watercourse
- Intermittent Watercourse
- Railway
- Municipal Boundary
- Provincially Significant Wetland
- Greenbelt - Protected Countryside
- Conservation Authority Regulated Area

0 50 100 200 300 400 500 600
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Natural Environment Assessment Area

Apr, 2017	1:8,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, Conservation Halton, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-1**

AECOM

3.1.2 Description of Existing Conditions

3.1.2.1 Designated Features

3.1.2.1.1 Provincially and Locally Significant Wetlands

A review of mapping data and aerial photography for Provincially and Locally Significant Wetlands did not result in any findings within the Assessment Area.

3.1.2.1.2 Areas of Natural and Scientific Interest (ANSIs)

A review of the Assessment Area was conducted using the *MNRF Make-a-Map: Natural Heritage Areas Application* (MNRF, 2016a) and did not yield any Life Science nor Earth Science ANSIs within the Assessment Area.

3.1.2.1.3 Environmentally Significant Areas (ESAs)

Review of mapping data and aerial photography did not indicate the presence of ESAs within the Assessment Area.

3.1.2.1.4 Conservation Authority Regulated Areas

The Assessment Area is located within the jurisdiction of Conservation Halton. Under Section 28 of the *Conservation Authorities Act* (1998), Regulated Areas are established where development could be subject to flooding, erosion or dynamic beaches, or where interference with wetlands and alterations to shorelines and watercourses might have an adverse effect on those environmental features. The northeast section of the Assessment Area intersects with a Regulated Area identified by Conservation Halton that is associated with the east branch of Sheldon Creek.

The activities of all federal and provincial Crown corporations are exempt from Conservation Authority permitting requirements under Section 28 of the *Conservation Authorities Act* and under Ontario Regulation 162/06 – *Halton Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Projects on lands owned by a Crown corporation and on behalf of a Crown corporation are also exempt. As a Crown corporation, Metrolinx is not required to apply for and obtain permits from Conservation Authorities. Notwithstanding this, wherever possible, Metrolinx shall engage Conservation Authorities on specific projects (or components thereof) and shall adhere to requirements where possible and feasible on aspects such as tree protection/removal, sewer discharge and requirements for working within Regulated Areas.

3.1.2.1.5 Municipal Official Plans – Natural Heritage System

Natural Heritage System features were identified within the Assessment Area; this includes a wooded portion of Sheldon Creek north of Wyecroft Road as well as Sherwood Forest Park to the south of the rail corridor west of Burloak Drive (Halton Region, 2015).

Sherwood Forest Park was identified as a Natural Feature / Open Space area (City of Burlington, 2015).

The east branch of Sheldon Creek was identified as a Natural Area, though no portion of the Natural Heritage System falls within the Assessment Area (Town of Oakville, 2009).

3.1.2.1.6 Regional Official Plan – Regional Natural Heritage System

Map 1 (Regional Structure) of the Halton Region Official Plan (Halton Region, 2015) identifies Regional Natural Heritage System (RNHS) “Key Features” within the Assessment Area; this includes a wooded portion of Sheldon Creek north of Wyecroft Road as well as Sherwood Forest Park to the south of the rail corridor, west of Burloak Drive.

Section 115 of the Official Plan identifies Key Features as SAR habitat, significant wetlands, significant woodlands, significant valley lands, significant wildlife habitat, ANSIs, and fish habitat. The purpose of the Regional Natural Heritage System is to preserve biological diversity and ecological functions of natural terrestrial and aquatic communities within the Region. Section 118 of the Official Plan states that an environmental impact assessment must be completed for development proposed within 120 m of RNHS features, and that development occurring within significant features must be in accordance with provincial and federal regulations (Halton Region, 2015). The Natural Environment Report, which fulfills this requirement, is found in **Appendix B1**.

Additionally, Halton Region seeks to retain treed areas within its jurisdiction, including along watercourses and transportation corridors (as stated in Section 147 of the Official Plan). Approval of proposed development will require completion of a tree inventory and preservation plan if tree removal is to occur, generally undertaken at the detailed design stage of projects (Halton Region, 2015). The Tree Inventory Plan has been completed and is found in **Appendix B2**.

3.1.2.2 Naturalized Areas and Vegetation Communities

3.1.2.2.1 Ecological Land Classification (ELC)

Several vegetation communities that are commonly encountered in urban settings were identified within the Study Area during the ELC surveys. The majority of vegetation communities identified were cultural, meaning that the community has resulted from, or has been maintained by, cultural or anthropogenic (human) influences, often containing a large portion of non-native species (Lee *et al*., 1998). **Figure 3-2A** and **Figure 3-2B** below shows the ELC delineations for the Study Area. Detailed descriptions noting dominant plants and community structure in each type of vegetation community are provided in **Section 3.2** of the Natural Environment Effects Assessment (**Appendix B1**) and are listed below.

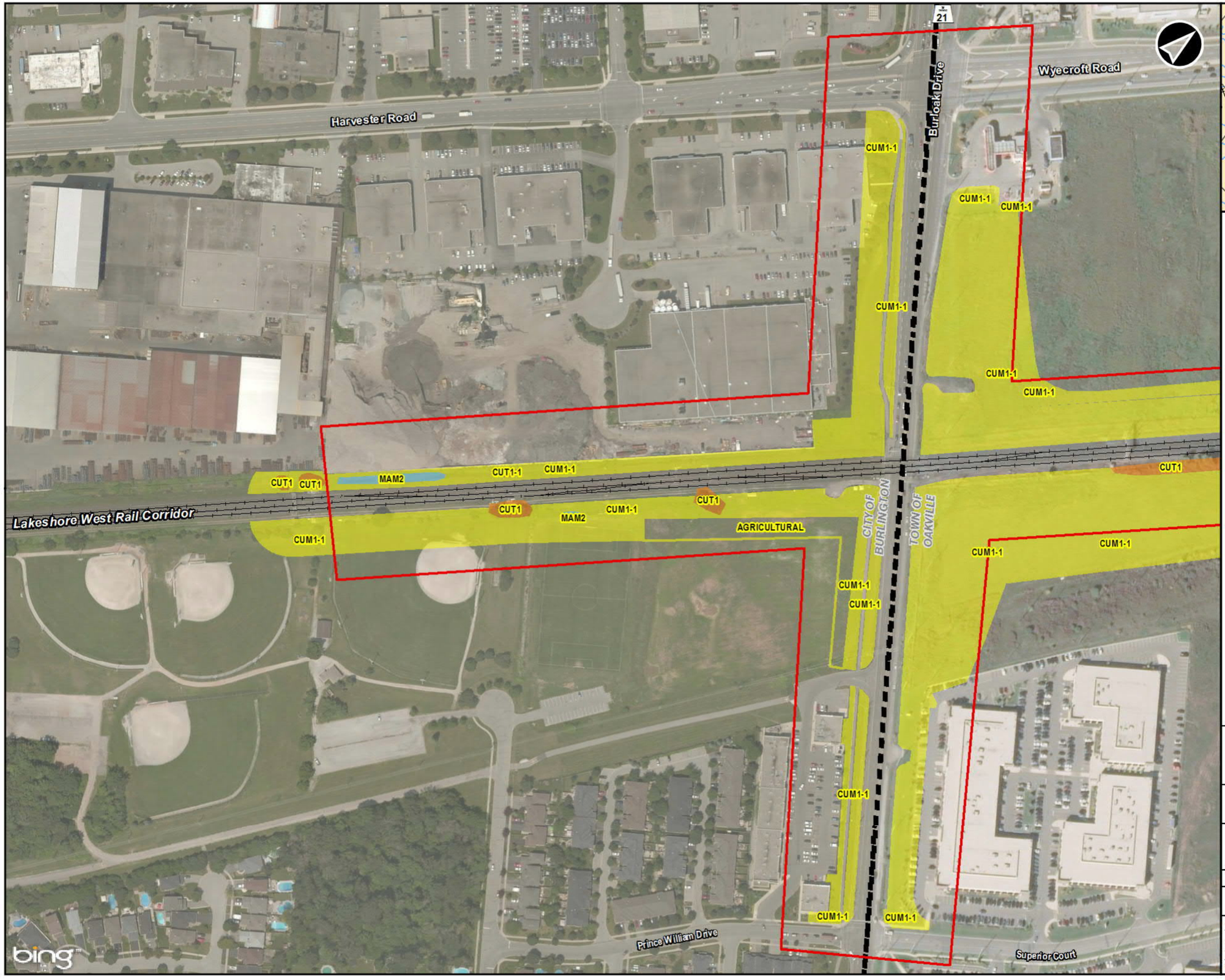
- CUM1-1: Dry – Moist Old Field Meadow
- CUT1: Mineral Cultural Thicket
- CUW1: Mineral Cultural Woodland
- MAM2: Mineral Meadow Marsh
- MAS2-1: Cattail Mineral Shallow Marsh
- FOD7: Fresh-Moist Lowland Deciduous Forest

3.1.2.2.2 Vascular Plant Inventory

A comprehensive list of all recorded vascular plants is provided in Appendix B of **Appendix B1**. A total of 126 vascular plant species were observed. Of these, 52 (41%) are native and 71 (56%) are non-native species. Three (3) plant species could only be identified to genus level and as such, were not included in the analysis as they could not be confirmed as native or non-native with certainty. One (1) Species of Conservation Concern (SOCC), Tall Boneset (*Eupatorium altissimum),* was observed during the inventory. This species is designated as provincially rare with an S-rank of S1; however it is only considered to be native in Essex County and considered elsewhere in Ontario to be introduced or adventive. In this case, the specimens are small isolated clumps located within a linear drainage feature adjacent to the rail corridor. They are believed to have been brought into the area by passing trains and therefore should not be considered rare.

3.1.2.2.3 Tree Inventory

A Tree Inventory Plan (**Appendix B2**) was completed to identify and assess the trees situated within the Study Area. A total of 180 trees were inventoried within the Study Area. Of these, 52 trees were recorded within the Lakeshore West Rail Corridor ROW, 71 trees were recorded within the City of Burlington, and 57 trees were situated within the Town of Oakville. Of the 57 trees located in Oakville, five (5) were within the Conservation Halton Regulated Area. A total of 20 trees that were originally inventoried are considered to be outside of the Study Area based on the preliminary design, including nineteen (19) within the City of Burlington and one (1) within the Town of Oakville. A preliminary estimate of 160 trees may be impacted by the Project based on the current preliminary design details.



Legend

- Study Area
- Railway
- Municipal Boundary
- Permanent Watercourse
- Intermittent Watercourse

Environmental Land Classification

- Agricultural
- CUM - Cultural Meadow
- CUT - Cultural Thicket
- CUW - Cultural Woodland
- FOD - Deciduous Forest
- MAM - Meadow Marsh
- MAS - Shallow Marsh

ELC Code	Vegetation Type
CUM1	Mineral Cultural Meadow Ecosite
CUM1-1	Dry - Moist Old Field Meadow Type
CUT1	Mineral Cultural Thicket Ecosite
CUT1-1	Sumac Cultural Thicket Type
CUW	Cultural Woodland
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite
MAM2	Mineral Meadow Marsh Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type

0 25 50 100 150
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

ELC of Vegetation Communities

Jul, 2017	1:2,600 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-2A**

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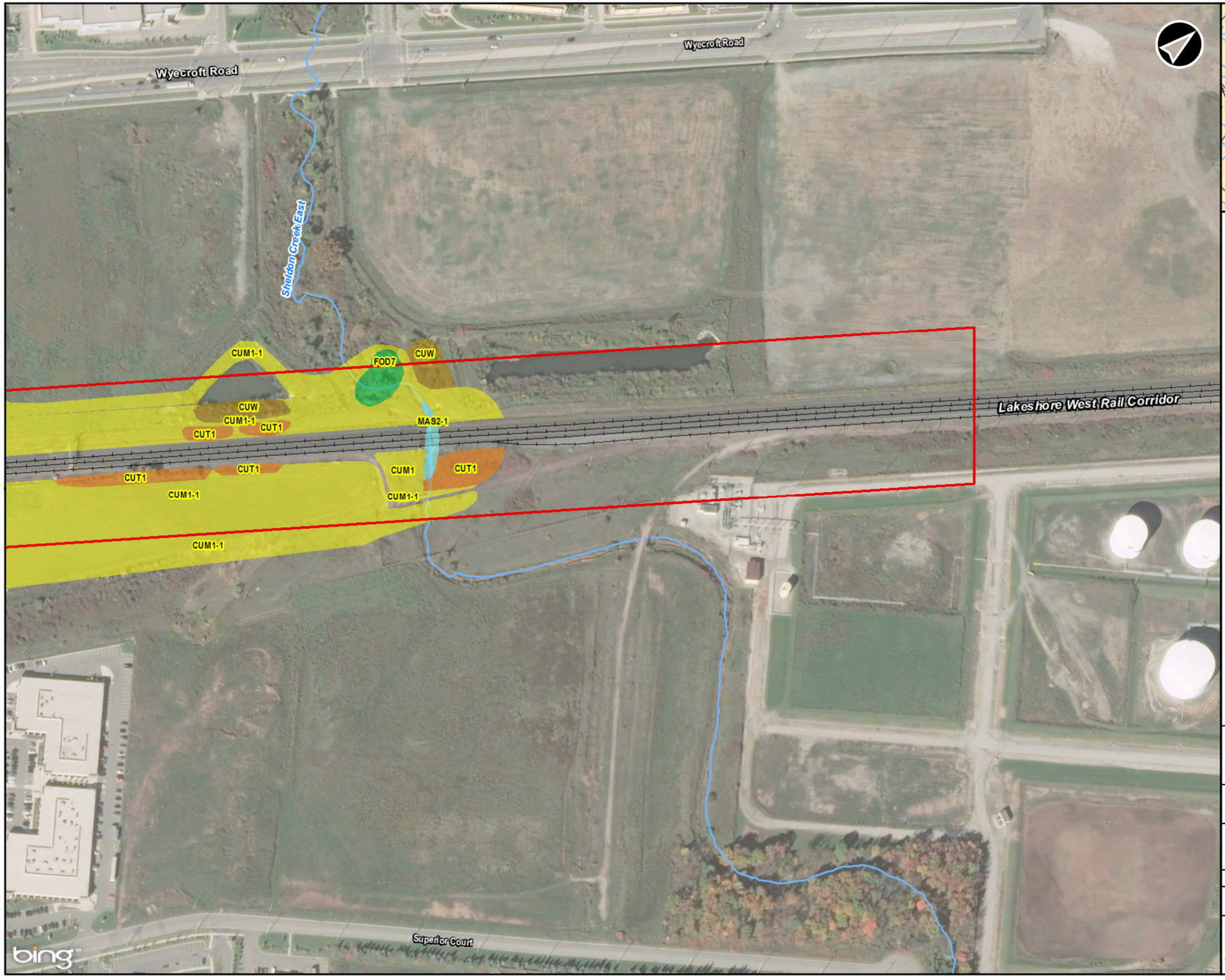

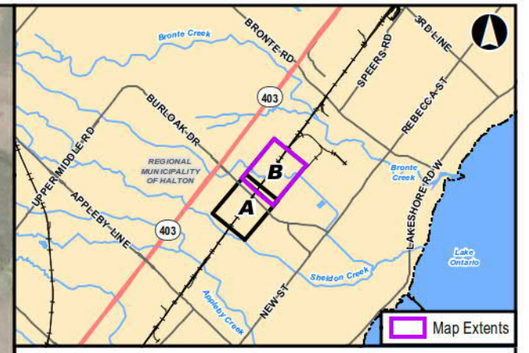

Legend

- Study Area
- Railway
- Municipal Boundary
- Permanent Watercourse
- Intermittent Watercourse

Environmental Land Classification

- Agricultural
- CUM - Cultural Meadow
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- CUW - Cultural Woodland
- FOD - Deciduous Forest
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ELC Code	Vegetation Type
CUM1	Mineral Cultural Meadow Ecosite
CUM1-1	Dry - Moist Old Field Meadow Type
CUT1	Mineral Cultural Thicket Ecosite
CUT1-1	Sumac Cultural Thicket Type
CUW	Cultural Woodland
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite
MAM2	Mineral Meadow Marsh Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type

0 25 50 100 150
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

ELC of Vegetation Communities

Jul, 2017	1:2,600 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-2B**

AECOM

Many of the trees inventoried showed signs of defects as a result of the urban landscape in which they are found. The most abundant species included Manitoba Maple (*Acer negundo*), Norway Maple (*Acer platanoides*) and Bur Oak (*Quercus macrocarpa*).

One (1) commonly encountered biotic stressor observed during the tree inventory and assessment was the presence of Emerald Ash Borer (EAB) (*Agrilus planipennis*). The EAB is a highly destructive invasive insect that attacks and kills all species of Ash trees native to North America. As such, the Canadian Food Inspection Agency (CFIA) has declared it an invasive alien species that must be quarantined (Government of Canada 2015). The characteristic D-shaped exit holes were not observed during the tree inventory; however, a number of White Ash (*Fraxinus americana*) trees were noted to have canopy dieback, which may be the result of EAB. A total of seven (7) White Ash trees were inventoried for this Project, with six (6) showing canopy dieback. Of these seven (7) White Ash trees, five (5) were dead, one (1) was in very poor condition, and one (1) was in good condition at the time of the assessment.

3.1.2.3 Wildlife and Wildlife Habitat

Potential wildlife and wildlife habitat was assessed through a combination of background review and field investigations undertaken in 2016 and 2017. The subsections below provided a summary of findings.

3.1.2.3.1 Herpetofauna

The results of the initial ELC field investigations were used to identify potential amphibian breeding sites. Suitable habitat was limited within the Study Area; small wetland patches were observed along the rail corridor but no vernal pools were observed. Two (2) stormwater management ponds exist to the east of Burloak Drive and north of the Lakeshore West Rail Corridor which may provide supporting habitat for breeding amphibians. However, these are not natural features and would not qualify as potential SWH. The east branch of Sheldon Creek was also identified as potential amphibian breeding habitat, as a wetland patch was observed along the watercourse adjacent to the Lakeshore West Rail Corridor.

Based on the results of the herpetofaunal surveys, where no amphibians were heard calling, there is no significant amphibian breeding habitat within the Study Area. It should be noted, however, that during the first round of surveys, American Toads (*Bufo americanus*) were heard calling in proximity to Station 4 (FROG04) after the surveys were completed for the evening. The survey station locations and the results of the survey are provided in **Appendix B1**.

3.1.2.3.2 Breeding Birds

Background reviews listed 81 species recorded in the vicinity of the Assessment Area (refer to Appendix E of **Appendix B1**). Of the 81 birds recorded, nine (9) Species at Risk (SAR) birds were identified; one (1) receives federal but not provincial protection, five (5) species are listed as Threatened and three (3) are listed as Special Concern on the Species at Risk in Ontario (SARO) list (BSC *et al*., 2006). One (1) species has no status under the *ESA*, but is listed as threatened under the federal *Species at Risk Act (SARA)*. The remaining species have no status. **Table 3-1** provides a summary of these species and their designations.

Table 3-1: Ontario Breeding Bird Atlas Records

Common Name	Scientific Name	S-Rank[1]	*ESA* Status[2]	*SARA* Status[3]
Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	THR
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S4B	SC	THR
Eastern Wood-Pewee	*Contopus virens*	S4B	SC	No Status
Bank Swallow	*Riparia riparia*	S4B	THR	No Status

Table 3-1: Ontario Breeding Bird Atlas Records

Common Name	Scientific Name	S-Rank[1]	*ESA* Status[2]	*SARA* Status[3]
Barn Swallow	*Hirundo rustica*	S4B	THR	No Status
Wood Thrush	*Hylocicla mustelina*	S4B	SC	No Status
Hooded Warbler	*Wilsonia citrina*	S4B	No Status	THR
Bobolink	*Dolichonyx oryzivorus*	S4B	THR	No Status
Eastern Meadowlark	*Sturnella magna*	S4B	THR	No Status

[1] ***S-rank:*** *The natural heritage provincial ranking system (provincial S-rank) is used by the MNRF's Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities.* The following status definitions were taken from NatureServe Explorer's (2015) National and Subnational Conservation Status Definitions available at http://explorer.natureserve.org/nsranks.htm:

SX - Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH- Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for.

S1 - Critically Imperiled — Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.

S2-Imperiled—Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.

S3 - Vulnerable—Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 - Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 - Secure—Common, widespread, and abundant in the nation or state/province.

SNR - Unranked—Province conservation status not yet assessed.

SU - Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA - Not Applicable — A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S# - Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Breeding Status Qualifiers

B - Breeding—Conservation status refers to the breeding population of the species in the province.

N - Nonbreeding—Conservation status refers to the non-breeding population of the species in the province.

M - Migrant—Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

Note: A breeding status is only used for species that have distinct breeding and/or non-breeding populations in the province. A breeding-status S-rank can be coupled with its complementary non-breeding-status S-rank if the species also winters in the province, and/or a migrant-status S-rank if the species occurs regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. The two (or rarely, three) status ranks are separated by a comma (e.g., "S2B,S3N" or "SHN,S4B,S1M").

Other Qualifiers

? -Inexact or Uncertain—Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the S-rank.)

[2]***ESA Status:*** *The ESA 2007 protects species listed as Threatened and Endangered on the SARO list on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:*

END *(Endangered) – A species facing imminent extinction or extirpation in Ontario.*

THR *(Threatened) – Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a large portion of its Ontario range if the limiting factors are not reversed.*

SC *(Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.*

NAR *(Not at Risk) – A species that has been evaluated and found to be not at risk.*

[3]***SARA Status****: The SARA protects SAR designated as Endangered, Threatened and Extirpated listed under Schedule 1, including their habitats on federal land. Schedule 1 of SARA is the official list of wildlife SAR in Canada and includes species listed as Extirpated, Endangered, Threatened and of Special Concern. Once a species is listed on Schedule 1, they receive protection and recovery measures that are required to be developed and implemented under SARA. Species that were designated at risk by COSEWIC before SARA need to be reassessed based on the new criteria of the Act before they can be listed under Schedule 1. These species that are waiting to be listed under Schedule 1 do not receive official protection under SARA. Once the species on other schedules (2 and 3) have been reassessed, the other schedules are eliminated and the species is either listed under Schedule 1 or is not listed under the Act. The following are definitions of the SARA status rankings assigned to each species in the table above:*

END (Schedule 1) *– These species are listed as Endangered under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.*

THR (Schedule 1) *– These species are listed as Threatened under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.*

SC (Schedule 1) *– These species are listed as Special Concern under Schedule 1 of SARA and receive management initiatives under SARA to prevent them from becoming endangered and threatened.*

No Status (No Schedule) *– These species are evaluated and designated by COSEWIC but are not listed under Schedule 1 and therefore do not receive protection under SARA.*

NAR (Not at Risk)*– These species have either been assessed by COSEWIC as Not at Risk or there is not enough data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.*

Not Applicable (N / A) *– These species have either been assessed by COSEWIC as Not at Risk or there is not enough data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.*

S-rank Breeding Status Qualifiers:

B: *Breeding—Conservation status refers to the breeding population of the species in the province.*
N: *Nonbreeding—Conservation status refers to the non-breeding population of the species in the province.*
M: *Migrant—Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.*

During the two (2) field surveys completed on June 20 and July 4, 2017, a total of 22 bird species were recorded; All species recorded are common in Ontario. The most abundant species observed during both surveys included the Red-winged Blackbird and Song Sparrow. The greatest abundance and diversity of birds were present in and around the Sheldon Creek East valley where a wider area of natural or quasi-natural vegetation was present.

Two (2) Barn Swallows were observed foraging over the rail corridor at the East end of the Study Area during the second survey, and may rely on the pumping station on the south side of the railroad for nesting activity.

Additionally, one (1) active Barn Swallow nest was observed under the railroad bridge over Sheldon Creek on the steel girder on the north side. The Barn Swallow is designated as Threatened in Ontario and receives protection under the *Endangered Species Act (ESA), 2007*.

An Important Bird and Biodiversity Area (IBA) is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations. The program was developed and sites identified by BirdLife International. According to the IBA Canada Interactive Map, there are no IBAs within the Assessment Area (BSC, 2016).

Other incidental wildlife observed during the surveys included an Eastern Cottontail (*Sylvilagus floridanus*) and a Monarch Butterfly (*Danaus plexippus*).The results of the breeding bird surveys are provided in **Table 3-2**.

Table 3-2: Breeding Bird Survey Results

Common Name	Scientific Name	Number of Individuals/ Territories Recorded on Each Survey		S-Rank[1]	*ESA* Status[2]	*SARA* Status[3]	OBBA 17PJ00 *(2001-2005)4*
		June 20, 2017	*July 4, 2017*				
American Goldfinch	*Cardeulis tristis*	3	6	S5B	-	-	CONF
American Robin	*Turdus migratorius*	5	5	S5B	-	-	CONF
Barn Swallow	*Hirundo rustica*	0	2	S4B	THR	-	CONF
Brown-headed Cowbird	*Molothrus ater*	2	3	S4B	-	-	CONF
Cedar Waxwing	*Bombycilla cedrorum*	2	1	S5B	-	-	CONF
Common Grackle	*Quiscalus quiscula*	3	2	S5B	-	-	CONF
Common Yellowthroat	*Geothlyphis trichas*	0	1	S5B	-	-	CONF
Eastern Kingbird	*Tyrannus tyrannus*	0	1	S4B	-	-	CONF
European Starling	*Sturnus vulgaris*	4	8	SNA	-	-	CONF
Gray Catbird	*Dumetella carolinensis*	1	1	S4B	-	-	CONF
Green Heron	*Butorides virescens*	0	1	S4B	-	-	POSS
House Finch	*Carpodacus mexicanus*	1	0	SNA	-	-	CONF
Killdeer	*Charadrius vociferus*	2	3	S5B,S5N	-	-	CONF
Mourning Dove	*Zenaida macroura*	0	4	S5	-	-	CONF
Northern Cardinal	*Cardinalis cardinalis*	3	3	S5	-	-	CONF
Northern Mockingbird	*Mimus polyglottus*	1	1	S4	-	-	CONF
Red-winged Blackbird	*Agelaius phoeniceus*	20	21	S4	-	-	CONF
Savannah Sparrow	*Passerculus sandwichensis*	3	1	S4B	-	-	CONF
Song Sparrow	*Melospiza melodia*	19	9	S5B	-	-	CONF
Tree Swallow	*Tachycineta bicolor*	0	1	S4B	-	-	CONF
Willow Flycatcher	*Empidonax traillii*	5	3	S5B	-	-	PROB
Yellow Warbler	*Dendroica petechia*	5	7	S5B	-	-	CONF

Notes: 1, 2 & 3: See notes under Table 3-1.

4. OBBA: Highest Breeding Category recorded

OBS = Observed
POSS = Possible
PROB = Probable
CONF = Confirmed

3.1.2.3.3 Mammals

Numerous mammal species are known to occur within the general vicinity of the Assessment Area. The majority of these species are common to the area. The geographic distributions of four (4) bat species (Eastern Small-footed Bat (*Myotis leibii*), Little Brown Bat (*Myotis lucifugus*), Northern Long-eared Bat (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) overlap with the Assessment Area. These four (4) bat species are designated as Endangered under the *ESA*. A list of mammal records within the Assessment Area is provided in **Table 3-3** below.

Table 3-3: Mammal Records

Taxon	Common Name	Scientific Name	S-Rank[1]	*ESA* Status[2]
Bat	Big Brown Bat	*Eptesicus fuscus*	S5	-
	Eastern Red Bat	*Lasiurus borealis*	S4	-
	Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END
	Little Brown Myotis	*Myotis lucifugus*	S4	END
	Northern Long-eared Myotis	*Myotis septentrionalis*	S3	END
	Silver-haired Bat	*Lasionycteris noctivagans*	S4	-
	Tri-coloured Bat	*Perimyotis subflavus*	S3?	END
Carnivore	Common Raccoon	*Procyon lotor*	S5	-
	Coyote	*Canis latrans*	S5	-
	Red Fox	*Vulpes vulpes*	S5	-
	Striped Skunk	*Mephitis mephitis*	S5	-
Deer	White-tailed Deer	*Odocoileus virginianus*	S5	-
Hare	European Hare	*Lepus europaeus*	SNA	-
Mole	Star-nosed Mole	*Condylura cristata*	S5	-
Opossum	Virginia Opossum	*Didelphis virginiana*	S4	-
Rabbit	Eastern Cottontail	*Sylvilagus floridanus*	S5	-
Rodent	Beaver	*Castor canadensis*	S5	-
	Deer Mouse	*Peromyscus maniculatus*	S5	-
	Eastern Gray Squirrel	*Sciurus carolinensis*	S5	-
	Eastern Chipmunk	*Tamias striatus*	S5	-
	Groundhog	*Marmota monax*	S5	-
	House Mouse	*Mus musculus*	SNA	-
	Meadow Jumping Mouse	*Zapus hudsonius*	S5	-
	Meadow Vole	*Microtus pennsylvanicus*	S5	-
	Muskrat	*Ondatra zibethicus*	S5	-
	Norway Rat	*Rattus norvegicus*	SNA	-
	Porcupine	*Erethizon dorsatum*	S4	-
	Red Squirrel	*Tamiasciurus hudsonicus*	S5	-
	White-footed Mouse	*Peromyscus leucopus*	S5	-
Shrew	Northern Short-tailed Shrew	*Blarina brevicauda*	S5	-
Weasel	American Mink	*Mustela vison*	S4	-

Notes: See notes under Table 3-1.

There were few trees of suitable size to be considered potential bat maternity roosting habitat observed within the Study Area. Discontinuous patches of hedgerow exist along the rail corridor and consist of scattered Manitoba maple (*Acer negundo*) and common buckthorn (*Rhamnus cathartica*) which were occasionally over 10 cm diameter at breast height (DBH). In the vicinity of the east branch of Sheldon Creek, there were several larger Manitoba maples located on the north side of the rail corridor, but these did not contain suitable cavities. This species generally does not produce high-quality bat roosting cavities, even when dead. Patches of staghorn sumac (*Rhus hirta*) and saplings of black walnut (*Juglans nigra*) were present but were of insufficient size for bat usage. West of Burloak Drive several honey locust (*Gleditsia triacanthos*) and Norway maple (*Acer platanoides*) had been planted near the rail corridor in Sherwood Forest Park. These measured approximately 10 cm DBH but did not contain cavities that could be used by bats. Smaller trees consisting of white spruce (*Picea glauca*), and several deciduous

trees were planted around stormwater ponds on the north side of the rail corridor and either side of Sheldon Creek. These trees were less than 10 cm DBH in size.

In summary, no trees that would provide suitable bat maternity roosting habitat were observed within the Study Area or within the vicinity of the Study Area.

3.1.2.3.4 Significant Wildlife Habitat (SWH)

The results of terrestrial field investigations completed within the limits of the Study Area were used to identify the presence of SWH. Based on the findings summarized below, the Study Area does not qualify under any SWH categories. The SWH screening document is provided in Appendix C of **Appendix B1**.

Seasonal Concentration Areas

No seasonal concentration areas of wildlife were identified within the Study Area during field investigations conducted in September 2016.

Rare Vegetation Communities or Specialized Habitats for Wildlife

No rare vegetation communities were identified within the Study Area during ELC surveys conducted in September 2016.

Habitats of SOCC

One (1) provincially rare plant, Tall Boneset (with S-rank of S1) plant was observed within a cultural meadow community during ELC surveys conducted in September 2016; however, this species is considered to be introduced or adventive in this part of Ontario and therefore does not qualify as a SOCC.

Animal Movement Corridors

No potential animal movement corridors were identified within the Study Area during field investigations conducted in September 2016

3.1.2.4 Fish and Fish Habitat

3.1.2.4.1 Watershed Description

The Assessment Area is within the Bronte Creek watershed and the Burlington Urban Creeks Subwatershed which both fall under the jurisdiction of Conservation Halton (Conservation Halton, 2013). The aquatic system within the Study Area is in a highly urbanized, pre-disturbed environment, demonstrating existing degradation to the water quality and associated habitat.

3.1.2.4.2 Existing Watercourse Crossing

The east branch of Sheldon Creek meanders through the Assessment Area within predominantly industrial lands and flows perpendicular to the Lakeshore West Rail Corridor east of Burloak Drive. From a review of the MNRF's Lands Information Ontario (LIO) database, the watercourse has been given a warm water thermal regime and five (5) fish species have been recorded within this watercourse: White Sucker (*Catostomus commersonii*), Rainbow Darter (*Etheostoma caeruleum*), Fathead Minnow (*Pimephales promelas*), Creek Chub (*Semotilus atromaculatus*) and Eastern Blacknose Dace (*Rhinichthys atratulus*). Two (2) stormwater management ponds discharge to this watercourse immediately north (upstream) of the rail crossing within the Assessment Area. The east branch of the Sheldon Creek is considered habitat for a Commercial, Recreational, or Aboriginal (CRA) fishery.

A culvert located approximately 200 m west of Burloak Drive conveys surface water from the ditch located along the bottom of the north slope of the railway embankment to south of the railway. It then conveys water west along the rail embankment for 54 m before turning south out of the Assessment Area. It is not connected to a fish bearing watercourse upstream or downstream of the Assessment Area and appears to be dry throughout most of the year due to terrestrial vegetation present throughout the ditch. Therefore it is not considered habitat for a commercial, recreational or Aboriginal fishery and a fish habitat assessment was not completed for this drainage feature.

3.1.2.4.3 Fish Habitat Assessment

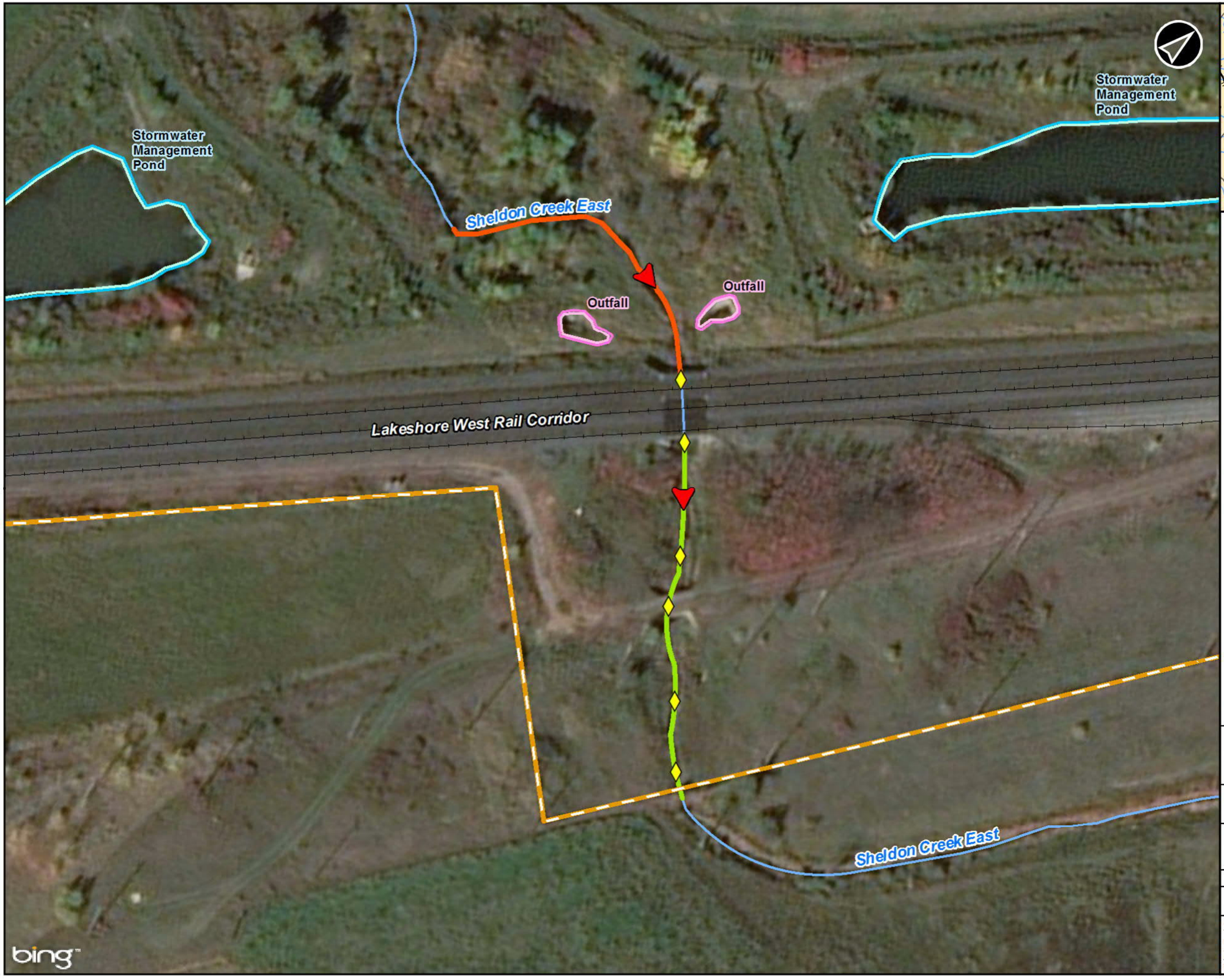
The east branch of Sheldon Creek is a small warm water creek that flows from northwest to southeast through predominantly industrial lands near the eastern boundary of the Assessment Area (see **Figure 3-3**). Details of the assessed area are described below which were collected on September 14, 2016. The aquatic photographic log is provided in Appendix D of **Appendix B1**.

Aquatic Habitat Assessments: Reach 1 (Upstream of Rail Crossing)

Reach 1 (**Figure 3-3**) was assessed from the rail crossing extending approximately 75 m upstream. This section flows through primarily cultural meadow and cultural woodland situated within industrial lands. The average wetted width at the time of assessment was approximately 1.0 m with an average wetted depth of approximately 0.2 m, and an average bankfull width of approximately 3.0 m. Within this section the substrate consisted primarily of gravel with cobble, sand and silt. Moderate flows were observed with the morphological structure consisting of predominantly flats with the exception of some small sections of pools, riffles and runs. Both right and left banks were well vegetated with herbaceous plant species, grasses and some deciduous trees and shrubs providing 75% coverage of the watercourse. The banks appeared to be stable with only minor signs of erosion observed sporadically along the upstream left bank. Instream cover consisted of aquatic emergent vegetation with some cobble scattered throughout. A large patch of cattails was observed ~5 m upstream of the rail crossing which may temporarily prevent fish passage during periods of low flow as the cattails almost completely obstruct the channel. Two (2) stormwater management pond outfalls provided minimal input at the time of assessment into the watercourse ~10 m upstream of the rail crossing. These outfalls convey discharge from stormwater management ponds located slightly northeast and southwest of the rail crossing likely providing higher contributions during/after precipitation events. No signs of erosion were noted. Cyprinids were observed throughout this section and during the assessment two (2) Creek Chub *(Semotilus atromaculatus)* and one (1) Bluegill (*Lepomis macrochirus*) were captured by dip net.

Aquatic Habitat Assessments: Reach 2 (Downstream of Rail Crossing)

Reach 2 (**Figure 3-3**) was assessed from the rail crossing extending downstream approximately 100 m to a barbed wire fence which extended across the watercourse. This section flows through primarily cultural meadow and cultural thicket habitat characterized by herbaceous vegetation and a lack of trees and shrubs, with 80% stream shading. The width of the channel within this section was smaller than the upstream section and had an average wetted width of approximately 0.75 m with an average wetted depth of approximately 0.20 m, and an average bankfull width of approximately 2.5 m. Within this section the substrate composition was similar to the upstream reach and consisted of primarily gravel followed by cobble, sand and silt. Moderate flows were observed with the morphological structure consisting of predominantly riffles with some small sections of runs, flats and a pool. Maximum depth of the pool was 0.30 m and it provided refuge habitat for resident fish species. Both right and left banks were well vegetated with herbaceous plant species, grasses and some deciduous shrubs and appeared to be stable with little to no signs of erosion. Instream cover consisted of a homogenous mixture of aquatic emergent vegetation and cobble. A large section of barbed wire fence was observed within the watercourse at the downstream limit of this reach.



Legend

- Flow Direction
- Minnow Trap
- Reach 1
- Reach 2
- Barbed Wire Fence
- Outfall
- Stormwater Management Pond
- Watercourse
- Railway

0 5 10 20 30 40 50 60
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Minnow Trap Locations

Jul, 2017	1:800 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-3**

AECOM

3.1.2.4.4 Fish Community Surveys

On September 14, 2016, a total of 92 fish were captured in the Assessment Area using minnow traps. See **Figure 3-3** for their locations within the Assessment Area. On November 25, 2016, a total of 106 fish were collected using a backpack electrofisher. Species and number of individuals captured during the fish community surveys are presented in
Table 3-4. The species found in this community assemblage are native to Ontario, have intermediate tolerance to poor habitat conditions, and are typically found in rivers with warm to coolwater thermal regimes.

Table 3-4: Fish Community Survey Results

Common Name	Scientific Name	Minnow Trap	Electrofishing	S-Rank[1]
Creek chub	*Semotilus atromaculatus*	75	74	S5
Eastern blacknose dace	*Rhinichthys atratulus*	13	29	S5
Bluegill	*Lepomis macrochirus*	3	3	S5
Fathead minnow	*Pimephales promelas*	1	0	S5

Notes: See under Table 3-1.

3.1.2.5 Species at Risk (SAR) or Species of Conservation Concern (SOCC)

Special consideration was given to identifying any SOCC and SAR in the vicinity of the Assessment Area. According to the *Significant Wildlife Habitat Technical Guide* (MNRF, 2000), SOCC includes those species that are listed on the SARO list as Special Concern and/or provincially significant with a provincial ranking of S1 (extremely rare), S2 (very rare) or S3 (rare to uncommon) by the MNRF's Natural Heritage Information Centre (NHIC).

SAR include species that are listed on the SARO list as Extirpated, Endangered or Threatened and which receive species and habitat protection under the *ESA*. SOCC do not receive legal protection under the *ESA*, but are protected under other Acts, such as the *Migratory Bird Convention Act (MBCA)*, 1994 and Ontario *Fish and Wildlife Conservation Act*, 1997, and planning documents. Additionally, habitat for these species is considered SWH under the Provincial Policy Statement (Ministry of Municipal Affairs and Housing (MMAH), 2014) and associated *Natural Heritage Reference Manual* (MNRF, 2010).

3.1.2.5.1 Terrestrial Rare Species

The MNRF Make-a-Map: Natural Heritage Areas application (MNRF, 2016a) was used to search for NHIC SAR records within the vicinity of the Assessment Area. The review of four (4) 1 km x 1 km map squares encompassing the Assessment Area revealed the occurrence of six (6) provincially rare species, which includes two (2) species listed as Endangered on the SARO list. These records are over 20 years old and in most cases at least 35 years old; additionally, given the extent of development over the last several decades, these species are unlikely to persist within the Assessment Area. As a result, these records are considered to be historic in nature and no longer warranted for consideration. The most recent record was that of Shiny Wedge Grass (*Sphenopholis nitida*), which was last recorded in 1988 within or in the vicinity of the Assessment Area. The list of NHIC records and other rare species that may occur within the Assessment Area are presented in **Table 3-5**.

Table 3-5: Rare Species Records

Taxon	Common Name	Scientific Name	S-Rank[1]	*ESA* Status[2]	*SARA* Status[3]	Year Last Observed
Bird	Northern Bobwhite[4]	*Colinus virginianus*	S1	END	END	1904
	Chimney Swift[5]	*Chaetura pelagica*	S4B, S4N	THR	THR	-
	Red-headed Woodpecker[5]	*Melanerpes erythrocephalus*	S4B	SC	THR	-
	Eastern Wood-Pewee[5]	*Contopus virens*	S4B	SC	No Status	-
	Bank Swallow[5]	*Riparia riparia*	S4B	THR	No Status	-
	Barn Swallow[5]	*Hirundo rustica*	S4B	THR	No Status	-
	Wood Thrush[5]	*Hylocicla mustelina*	S4B	SC	No Status	-
	Hooded Warbler[5]	*Wilsonia citrina*	S4B	No Status	THR	-
	Bobolink[5]	*Dolichonyx oryzivorus*	S4B	THR	No Status	-
	Eastern Meadowlark[5]	*Sturnella magna*	S4B	THR	No Status	-
Plant	Shiny Wedge Grass[4]	*Sphenopholis nitida*	S1	-	-	1988
	Brainerd's Hawthorn[4]	*Crataegus brainerdii*	S2	-	-	1981
	Northern Hawthorn [4]	*Crataegus pruinosa var. dissona*	S3	-	-	1982
	Virginia Bluebells[4]	*Mertensia virginica*	S3	-	-	1982
Mammal	Eastern Small-footed Myotis[6]	*Myotis leibii*	S2S3	END	-	-
	Little Brown Myotis[6]	*Myotis lucifugus*	S4	END	END	-
	Northern Long-eared Myotis[6]	*Myotis septentrionalis*	S3	END	END	-
	Tri-coloured Bat[6]	*Perimyotis subflavus*	S3?	END	END	-

*Notes: 1, 2 & 3. See notes under **Table 3-1**.*
4. Sourced from the NHIC database
5. Sourced from the Ontario Breeding Bird Atlas
6. Sourced from Bat Conservation International

3.1.2.5.2 Aquatic Rare Species

NHIC aquatic rare species records include historical documentation of Shortnose Cisco (*Coregonus reighardi*) in the larger watershed. Within the assessed reach, suitable habitat conditions do not exist for this species. Further, based on MNRF correspondence, no aquatic SOCC were identified within the Assessment Area.

According to Fisheries and Oceans Canada (DFO) SAR mapping (2016), no SAR are known to occur within the vicinity of the Assessment Area.

3.1.2.5.3 SAR and SOCC Screening

The results of the background review and agency consultation revealed that 43 SAR and SOCC may potentially occur within the Study Area. In order to better understand which species may be affected by the Project, a habitat assessment of each SAR and SOCC species was completed to refine the list of possible candidate species that are more likely to be present within the Study Area. This assessment included screening the preferred habitat of each SAR and SOCC against the habitat conditions present in the Study Area to determine whether there is potential for that SAR or SOCC to occur. It was determined that potential habitat for four (4) rare species is present within the Study Area: Barn Swallow (*Hirundo rustica)*; Chimney Swift (*Chaetura pelagica*); American Columbo (*Frasera caroliniensis*); and Dense Blazing Star (*Liatris spicata*). Under the *ESA*, one (1) species is listed as Endangered (American Columbo), and three (3) species are listed as Threatened (Barn Swallow, Chimney Swift and Dense Blazing Star). The SAR habitat screening document is provided in Appendix F of **Appendix B1**.

Barn Swallow and Chimney Swift often inhabit urban areas, where they nest in human-made structures such as barns, bridges, culverts and chimneys (MNRF 2015b; MNRF 2016b). Cultural meadow and meadow marsh communities identified within the Study Area provide suitable foraging habitat for these species. However, protected habitat for these species is determined by nest locations. One (1) Barn Swallow nest was observed during the breeding bird surveys completed in 2017.

The two (2) plant species, American Columbo and Dense Blazing Star, were ruled out as these were not encountered during field investigations.

3.2 Geology and Groundwater

3.2.1 Methods

The following background data and reports were reviewed as part of this geology and groundwater assessment:

- Geotechnical Investigation Report for the Burloak Drive ROW, from Rebecca Street to Upper Middle Road, Terraprobe Inc., dated August 21, 2013;
- Ontario Geological Survey (OGS) and Geological Survey of Canada (GSC) surficial and bedrock geology mapping;
- Base mapping data from the MNRF;
- MOECC water well record database and Ontario Geotechnical Borehole Database;
- Source Water Protection Plan (Halton and Hamilton Source Protection Region, 2015);
- The Source Water Protection Information Atlas developed by the MOECC (2016); and
- Bedrock topography mapping from the Ministry of Northern Development and Mines.

3.2.2 Description of Existing Conditions

3.2.2.1 Geological Setting

3.2.2.1.1 Topography and Physiography

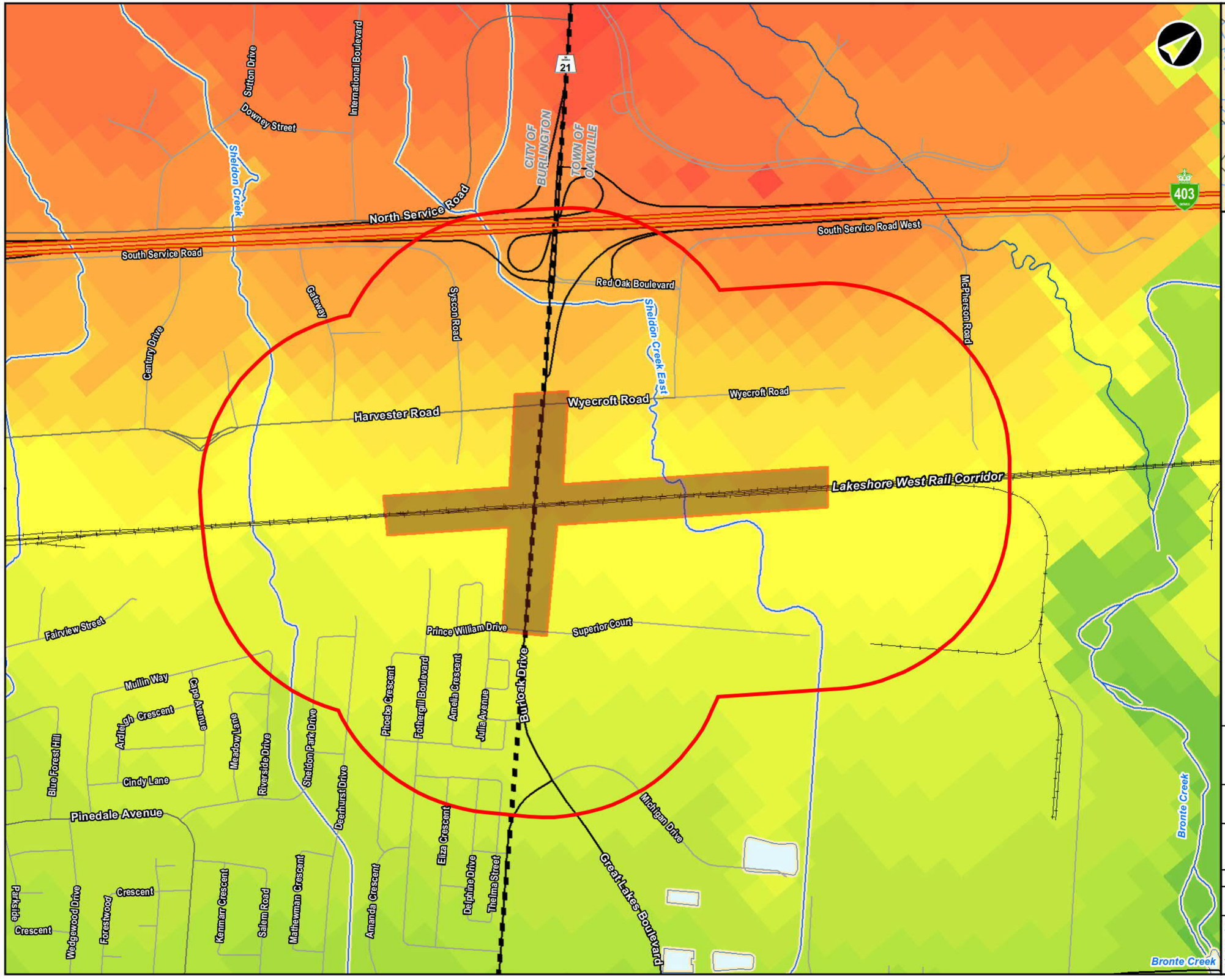
The Study Area lies within the Iroquois Plain physiographic region, as mapped by Chapman and Putnam (1984). The Iroquois Plain is described as lowlands bordering on Lake Ontario, representing the historic shoreline of Lake Iroquois during the last glacial period. Permeable sands and depositional features such as cliffs, bars, beaches and boulder pavements comprise much of the northern portion of the region. Along the present-day shoreline of Lake Ontario within the City of Toronto, the Iroquois Plain is dominated by sand plains, bevelled till plains, and beaches.

The ground surface topography within the Study Area is characterized as level to nearly flat, with a general southward decline toward Lake Ontario. The topographic highs within the Study Area are shown on **Figure 3-4**.

3.2.2.1.2 Overburden Geology

According to OGS mapping, surficial geology within the Study Area (**Figure 3-5**) consists of Paleozoic bedrock (Sharpe, 1980).

The Ontario Geotechnical Borehole Database (2012) indicates that within the Study Area, the thickness of the overburden is approximately 1 to 2 m and the dominant soil types are clay and silt.



Legend

- Study Area
- Hydrogeology Assessment Area (500m)
- Unknown Thermal Regime
- Wam Thermal Regime
- Freeway
- Major Road
- Collector Road
- Local Road
- Railway
- Municipal Boundary

Elevation (mASL)

133

75

0 50 100 200 300 400 500 600 700

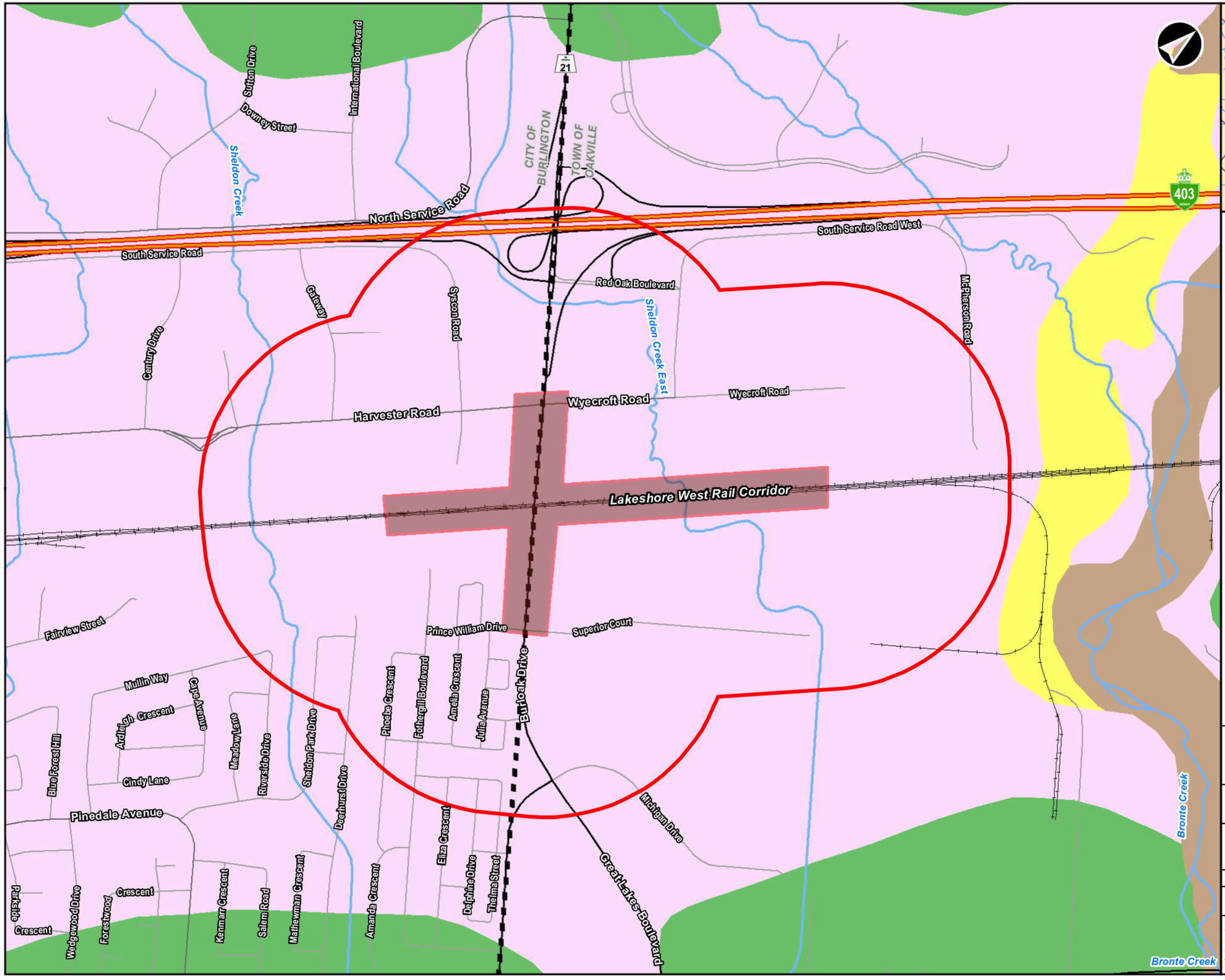
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Topography and Drainage

Sep, 2017	1:10,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-4**

AECOM



Legend

- Study Area
- Hydrogeology Assessment Area (500m)
- Freeway
- Major Road
- Collector Road
- Local Road
- Railway
- Watercourse
- Municipal Boundary

Surficial Geology

- Paleozoic bedrock
- Glaciolacustrine-derived silty to clayey till
- Coarse-textured glaciolacustrine deposits
- Modern alluvial deposits

0 50 100 200 300 400 500 600 700

Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Surficial Geology

Sep, 2017	1:10,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-5**

AECOM

3.2.2.1.3 Bedrock Geology

According to the OGS 2011 (1:250,000 mapping), the bedrock formation underlying the Study Area is Queenston Formation of Upper Ordovician age. The Queenston Formation underlying the Study Area is comprised of shale, limestone, dolostone, and siltstone.

The Queenston Formation is a dark red, low-fissility shale/siltstone with green mottling. The green mottled zones are occasionally harder than the softer red shale (which appears as recessive horizons along the Bronte Creek valley outcrop), possibly indicating a higher carbonate content which is called “limestone” by local convention. However, the Queenston shale within the Study Area is generally calcareous, and is interbedded with stronger calcareous sandstone and silty bioclastic carbonate (which are observed as the protruding horizons along the Bronte Creek valley outcrop). Minor amounts of gypsum, in nodules and laminae, are found throughout. These, along with occasional weathered clay seams and partings, indicate the presence of groundwater within the bedrock. (Terraprobe Inc., 2013)

3.2.2.2 Hydrogeological Setting

As described in **Section 3.2.2.1**, the overburden within the Study Area is reported to be very thin (less than 2 m) and bedrock outcrops can be found in places; therefore, overburden aquifers are not expected to be present in the area.

Shale bedrock of the Queenston Formation is interbedded with limestone, dolostone, and siltstone. Within a buffer of 500 m from the Study Area only one (1) MOECC well record was identified. The recorded static water level within this well is 4 mbgs, which is in the bedrock. Although according to this MOECC well record groundwater has occurred within the upper 5 m of the bedrock, the Queenston formation is known as a poor aquifer with low water-yielding capability.

3.2.2.3 Groundwater Resources

3.2.2.3.1 Municipal Water Supply

The MOECC identifies a number of source water protection regions. The subject site is located within the Halton Region Source Protection Area, which is a part of the Halton-Hamilton Source Protection Region.

According to the Ontario Source Protection Plan for the Halton Region and the Hamilton Region Source Protection Areas (the Plan), there are no municipal groundwater supply wells or associated Well Head Protection Areas (WHPA) within the Study Area.

The Source Water Protection Information Atlas developed by the MOECC (2016) identifies that the Study Area is not located in a Highly Vulnerable Aquifer (HVA) area. According to this atlas, Intake Protection Zones (IPZs) associated with the five (5) Lake Ontario surface water intakes extend into the Study Area. Refer to **Table 3-6** for a list of source water protection areas/features and results/scores for the Study Area.

Table 3-6: Source Water Protection Areas and Vulnerability Scores

Protection Area Type	Description of Protection Area	Vulnerability Score
Wellhead Protection Area	An area that is related to a well and within which it is desirable to regulate or monitor drinking water threats. Land area around a well where contaminants from land activities can reach and pollute the well water supply. Subdivided concentrically to show risk; scores range between 2 (lowest) and 10 (highest). In general, an 8 or 10 indicate there is a policy for a certain activity to prohibit or manage it.	No
Wellhead Protection Area E	The area around a well where water quality could be impacted by surface water.	No

Table 3-6: Source Water Protection Areas and Vulnerability Scores

Protection Area Type	Description of Protection Area	Vulnerability Score
Intake Protection Zone	Areas of land and water that contribute source water to a drinking water system intake within a specified distance, period of flow time, and/or watershed area and within which it is desirable to regulate or monitor drinking water threats.	Zone 2, Score 4
Issue Contributing Area	An area where land-based activities contribute to the presence of an unwanted substance in the water source. Activities producing the substance may be prohibited or need to be managed more effectively.	No
Significant Groundwater Recharge Area	This is an area within source protection area where a relative majority of the recharge occurs.	No
Highly Vulnerable Aquifer	An underground water supply, or aquifer, that can easily be contaminated because overlaying soil layers are thin or permeable.	No
Event Based Area	The event based area was delineated after modeling an activity having a resultant adverse impact on the intake's water quality. An area within a watershed where a spill could pollute the drinking water supply because of activities such as those associated with sanitary sewers, pipelines, etc. that are close to rivers, streams or other water bodies. Types of Events: Stored/Transported Fuel/Oil; Pipeline Fuel/Oil Spill, etc. The event based area outside the intake protection zone two is called an intake protection zone three.	No

The Project Study Area falls within IPZ 2, which has been assigned a vulnerability score of four (4). Vulnerability scores assigned to IPZs reflect the susceptibility of the intakes to contaminants. The assigned vulnerability score of four (4) indicates that activities undertaken within this zone are of low risk to the municipal water source.

It should be noted that the province has recently amended the Technical Rules and methodology for assigning vulnerability scores for Great Lakes intakes. The Halton-Hamilton Source Protection Committee will be reviewing this new method over the next year and as a result, the vulnerability score for Project Study Area may change. However, as noted in correspondence with the Halton-Hamilton Source Protection Committee on November 21, 2017, it is unlikely that activities associated with construction of the Project would result in adverse effects on the municipal water source.

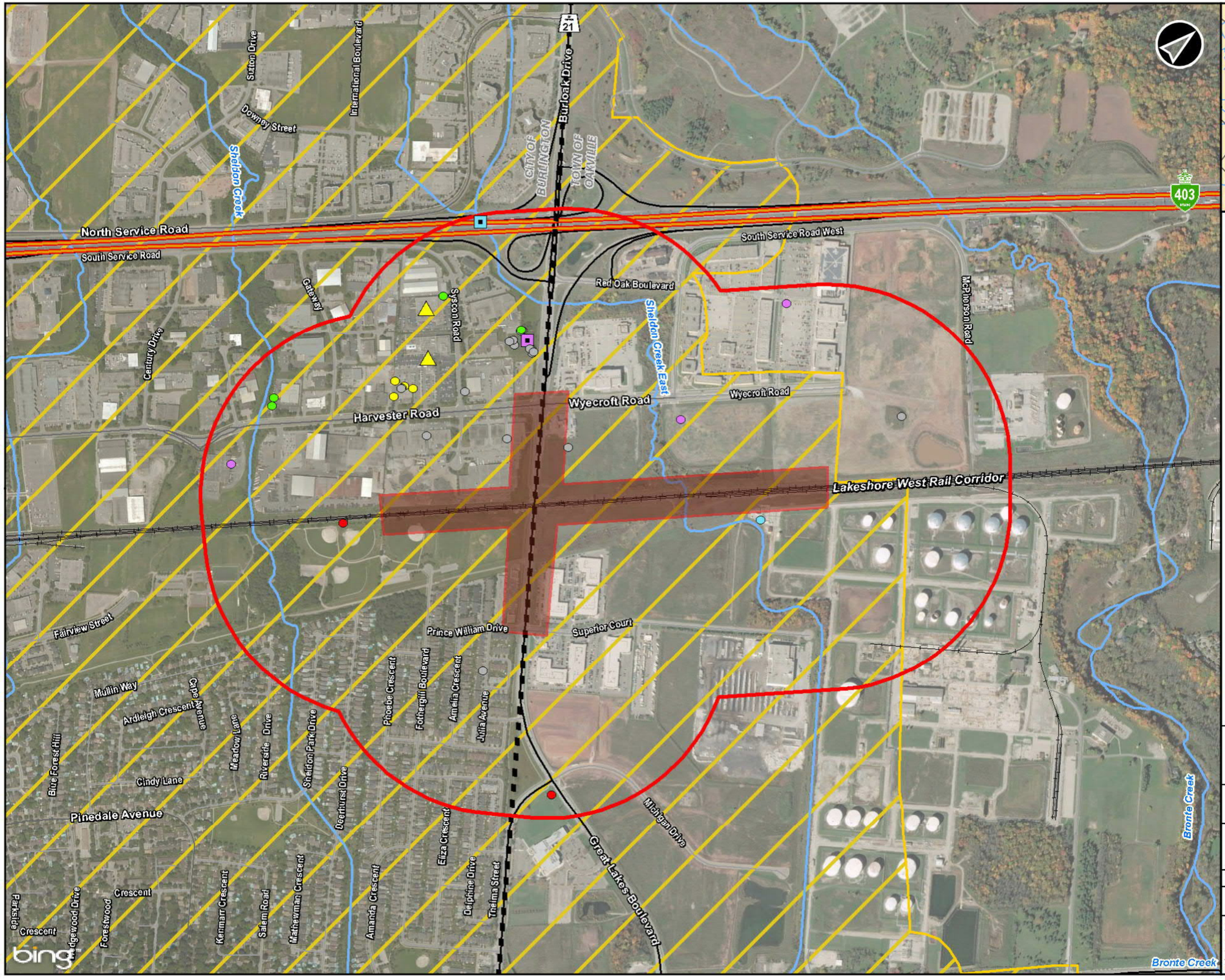
3.2.2.3.2 MOECC Water Well Records

An inventory of local private water wells (i.e., domestic, commercial, industrial, etc.) was prepared within an area of 500 m buffer from the Study Area using the MOECC Well Record database. Results are shown in **Figure 3-6**, along with the primary use of each well. A total of 35 well records were found located within an area of 500 m buffer from the Study Area. A review of the well records indicates that the majority of wells extend to a depth less than 12 m and are identified as eleven (11) monitoring/test boreholes, one (1) water supply well for domestic purposes, three (3) as not used and 20 had no well use identified.

3.2.2.3.3 Depth to Groundwater Table

According to limited water table information available in the MOECC Well Database for the area, the depth to the static water level is expected to be approximately 4 mbgs. Static water levels may fluctuate considerably in response to changes in precipitation patterns and seasonal fluctuations.

According to geotechnical investigation report prepared by Terraprobe Inc. for the Burloak Drive corridor from Rebecca Street to Upper Middle Road, dated August 21, 2013, the most recent groundwater depths/elevations within five (5) monitoring wells located in the vicinity of Burloak Drive and Harvester Road / Wyecroft Road (THU-WM1 to THU-WM3, BH 2+640, and BH 3+065) ranged between 1.2 (THU-WM1 measured in December 6, 2005) and 8.8 (BH 2+640 measured in February 12, 2013) mbgs, and 105.7 and 96.8 mASL, respectively.



Legend

- Study Area
- Hydrogeology Assessment Area (500m)
- Freeway
- Major Road
- Collector Road
- Local Road
- Railway
- Watercourse
- Intake Protection Zone(IPZ) - Zone 2 Score 4
- Municipal Boundary
- Environmental Activity and Sector Registry (EASR) registration

Permit to take Water Purpose

- Dewatering
- Dewatering Construction

Water Well Primary Use

- No Data
- Domestic
- Monitoring
- Monitoring and Test Hole
- Not Used
- Test Hole

0 50 100 200 300 400 500 600 700
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

MOECC Water Wells, Permits to Take Water, and EASR

Nov, 2017	1:10,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-6**

AECOM

3.2.2.3.4 Existing Permit to Take Water and Environmental Activity and Sector Registry

A query of the MOECC Permit to Take Water (PTTW) and Environmental Activity and Sector Registry (EASR) databases was conducted within a 500 m buffer of the Study Area. Within the 500 m buffer, three (3) PTTWs were identified as being expired and two (2) EASRs are associated with Standby Power System and Heating System activities. No PTTWs or EASR registrations were identified for water taking. Results are shown in **Figure 3-6**.

3.3 Air Quality

3.3.1 Methods

The following three (3) scenarios were assessed in the Air Quality Assessment Report (**Appendix B3**):

- Current/Existing Conditions (year 2016);
- Future "No-Build" Conditions (year 2032) assuming no change to the current configuration of Burloak Drive; and
- Future "Build-Out" Conditions (year 2032) assuming proposed changes to grade and width of Burloak Drive.

Local air quality impacts were determined by comparing predicted modelled concentrations combined with actual background ambient levels of key contaminants to the established standards and guidelines at representative sensitive receptors (residences) within the Air Quality Assessment Area. The air quality assessment used for this study was a "Comprehensive Analysis". This type of analysis combines measured meteorological data and background air quality data obtained from the MOECC and National Air Pollution Surveillance (NAPS) and traffic data projections. The modelling assessed the highest concentration using predicted traffic emissions, which were modelled with 24-hour averaging period atmospheric conditions. The scope of this assessment was limited solely to the emissions from vehicle traffic. The Project does not include any modifications that would impact the operation of rail vehicles; thus emissions from those sources were not assessed.

In addition, the Project's impact on climate change was assessed using a Regional Burden Analysis to examine the project-related contribution to greenhouse gas (GHG) emissions and criteria air contaminants (CACs) identified by the provincial government as being critical to air quality in Ontario. The regional burden analysis compares annual emissions of GHG and CAC contaminants to the Ontario Greenhouse Gas and Criteria Air Contaminant reduction targets and province-wide and Canada-wide emissions. GHG contaminants include atmospheric CO_2, methane, and nitrous oxides (N_2O). CAC contaminants include CO, NO_X, PM_{10}, $PM_{2.5}$, PAHs and VOCs.

3.3.1.1 Key Contaminants

The primary emission sources for this air quality assessment are the road traffic and idling vehicles on key public roads within the Air Quality Assessment Area. Based on recommendations within the Ministry of Transportation (MTO) 2012 guidance document, *Environmental Guide for Air Quality Impacts and Greenhouse Gas Emissions*, the Air Quality assessment included the following pollutants from road vehicle emissions:

- Nitrogen dioxide, NO_2 (assessed over 1-hour and 24-hour averaging periods);
- Carbon monoxide, CO (assessed over 1-hour and 8-hour averaging periods);
- Particulate matter (<10 microns), PM_{10} (assessed over 24-hour and annual averaging periods);
- Particulate matter (<2.5 microns), $PM_{2.5}$ (assessed over 24-hour averaging period);
- Acetaldehyde (assessed over 24-hour averaging period);
- Acrolein (assessed over 1-hour and 24-hour averaging periods);
- Benzene (assessed over 24-hour and annual averaging periods);

- Benzo(a) pyrene, BaP (assessed over 24-hour and annual averaging periods);
- Formaldehyde (assessed over 24-hour averaging period); and
- 1,3-butadiene (assessed over 24-hour and annual averaging periods).

Emissions of the coarse fraction of particulates (PM_{10}) are emitted mostly from tire wear, brake wear, and road dust fugitives, whereas the fine fraction ($PM_{2.5}$) is attributed to vehicle emission exhausts.

In addition to the above, impacts of pollutants contributing to the regional GHG levels were assessed. The pollutants in this assessment included carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4). The impacts of these pollutants were compared to the MOECC projected transportation emissions for 2026, in units of carbon equivalent, CO_2e, as shown in the Ontario's Climate Change Update 2014 document.[1]

The modelling results were compared to the Ambient Air Quality Criteria (AAQC) and the Canadian Ambient Air Quality Standards (CAAQs). In addition, the Project's impact on climate change was assessed by examining the project related contribution to GHG emissions relative to Ontario GHG reduction targets.

3.3.1.2 Relevant Air Quality Guidelines

The applicable standards for these pollutants are regulated by the following jurisdictions:

- MOECC: AAQC; and
- Environment Canada: CAAQS.

A summary of standards used for this Air Quality Assessment is shown below in **Table 3-7**. Where multiple sources of a standard are available, the most stringent value is shown.

Table 3-7: Summary of Applicable Guidelines and Standards

Contaminant	Source of Standard	Averaging Period (hr)	Air Quality Threshold Value (µg/m^3)
NO_2	AAQC	1	400
	AAQC	24	200
CO	AAQC	1	36,200
	AAQC	8	15,700
PM_{10} [1]	AAQC	24	50
$PM_{2.5}$ [2]	CAAQS	24 (2015)	28
	CAAQS	24 (2020)	27
	CAAQS	Annual	8.8
Acetaldehyde	AAQC	24	500
Acrolein	AAQC	1	4.5
	AAQC	24	0.4
Benzene	AAQC	24	2.3
	AAQC	Annual	0.45
Benzo(a)pyrene	AAQC	24	0.00005
	AAQC	Annual	0.00001
1,3-Butadiene	AAQC	24	10
	AAQC	Annual	2
Formaldehyde	AAQC	24	65

Note: 1. The value of 50 µg/m^3 (24 hr) is an interim AAQC and is provided as a guide for decision making.
2. The air quality threshold for fine particulate ($PM_{2.5}$) is based on the 98th percentile ambient measurement (24-hour), annually averaged over three years. This standard is referenced from the appropriate year of the Canadian Ambient Air Quality Standards (CAAQs): 2015 CAAQs for the 2016 current year, and 2020 CAAQs for the 2032 future no-build and build-out year. The CAAQs are voluntary objectives.

1. *Ministry of the Environment and Climate Change "Ontario's Climate Change Update 2014" accessed March 24, 2017* https://dr6j45jk9xcmk.cloudfront.net/documents/3618/climate-change-report-2014.pdf

3.3.2 Description of Existing Conditions

The baseline ambient air quality assessment was based on publicly available historical data from ambient air quality monitoring stations within Ontario. The data was the latest publicly available at the time of the air quality assessment conducted for this Project (September, 2017). The Air Quality Assessment Report is provided in **Appendix B3**. Four (4) NAPS Environment Canada monitoring stations were identified by proximity to the Air Quality Assessment Area. These four (4) stations were:

- Burlington Station (NAPS ID 63001);
- Hamilton (Downtown) Station (NAPS ID 60512);
- Oakville Station (NAPS ID 61603); and
- Simcoe Station (NAPS ID 62601).

Ambient air quality was estimated using 90th percentile ambient pollutant concentrations for appropriate time averaging periods. Gaps of six days or more in raw background data measurements were filled using the 90th percentile of the existing data set for each station.

The monitoring station with the highest maximum hourly record during the most complete five-year meteorological period (2011-2015) was used for each pollutant. Data for the 2016 calendar year was not available during the preparation of this assessment.

Details of the Air Quality monitoring stations located closest to the Air Quality Assessment Area are provided in **Table 3-8**.

Table 3-8: Summary of Monitoring Stations Used in Ambient Air Quality Analysis

	NAPS Monitoring Stations			
Station Name	**Burlington Station**	**Hamilton (Downtown)**	**Oakville Station**	**Simcoe Station**
NAPS Number	63001	60512	61603	62601
Address	324 Grand River Ave., Burlington	Elgin St./Kelly St., Hamilton	West Ave & Homewood Ave., Oakville	Exhibition St. And Clark St. W., Simcoe
Latitude	43.1386	43.2578	43.4438	43.5455
Longitude	-80.2926	-79.8617	-80.5038	-74.288475
Station Type	Urban	Urban	Urban	No Data
Height of Air Intake	5 m	4 m	12 m	No Data
Elevation ASL	78 m	90 m	165 m	No Data
Pollutants Measured	O_3, NO_2, $PM_{2.5}$	O_3, CO, NO_2, $PM_{2.5}$, Benzene, 1,3-Butadiene, Benzo(a)pyrene	O_3, NO_2, $PM_{2.5}$, Benzene, 1,3-Butadiene	NO_2, $PM_{2.5}$, Benzene, 1,3-Butadiene, Formaldehyde, Acetaldehyde, Acrolein

Notes: ASL – above sea level

Table 3-9 below shows a summary of the maximum 90th percentile values for each contaminant for all respective averaging periods.

Table 3-9: Background Ambient Air Quality Concentrations

				90th Percentile Concentrations (µg/m³)						
Contaminant	**Averaging Period (hr)**	**Station ID**	**Station Name[1]**	**2011**	**2012**	**2013**	**2014**	**2015**	**Maximum**	**Average**
NO_2	1	060512	Hamilton	47	47	47	44	46	47	46.1
	24	060512	Hamilton	41	40	41	39	39	41	40.1
CO	1	060512	Hamilton	458	458	458	458	458	458	458
	8	060512	Hamilton	458	458	458	458	458	458	458
PM_{10} [4]	24	060512	Hamilton	30	31	33	35	35	35	33.0
$PM_{2.5}$	24	060512	Hamilton	16	17	18	19	19	19	17.8
	Annual [6]	060512	Hamilton	8	8	10	11	10	11	9.40
Acetaldehyde [2]	24	062601	Simcoe	-	-	-	0.857	0.473	0.857	0.665
Acrolein [2]	1 [5]	062601	Simcoe	-	-	-	0.022	0.030	0.030	0.026
	24	062601	Simcoe	-	-	-	0.022	0.030	0.030	0.026
Benzene [3]	24	060512	Hamilton	-	2.09	2.68	1.90	1.81	2.68	2.12
	Annual [6]	060512	Hamilton	-	1.11	1.26	0.91	1.16	1.26	1.11
Benzo(a)pyrene [3]	24	060512	Hamilton	-	0.001	0.002	0.001	0.001	0.002	0.0011
	Annual [6]	060512	Hamilton	-	0.001	0.001	0.0004	0.0003	0.001	0.001
Formaldehyde [2]	24	062601	Simcoe	-	-	-	1.88	1.64	1.88	1.76
1,3-Butadiene [3]	24	060512	Hamilton	-	0.080	0.081	0.058	0.065	0.081	0.071
	Annual [6]	060512	Hamilton	-	0.048	0.045	0.036	0.043	0.048	0.043

Notes:
1. *Station Name station refers to the location at which the highest measurement was recorded among the four stations.*
2. *Measurements for Acetaldehyde, Acrolein, and Formaldehyde were unavailable for the years 2011, 2012 and 2015. Annual averaging period shows the calculated Annual Average for each study year.*
3. *Measurements for Benzene, Benzo(a)pyrene and 1,3-Butadiene were unavailable for the year 2011.*
4. *PM_{10} was not included in NAPS Station measurements, and therefore was estimated using $PM_{2.5}$ measurements, assuming a ratio of 0.54 µg/m³ PM_{10} per 1 µg/m³ of $PM_{2.5}$.*
5. *Since measurements are taken as a daily average, background concentrations for the hourly averaging period are assumed to be equal to the 24-hr average*
6. *The annual average was calculated from the daily measurements taken at the monitoring stations for that calendar year. Measurements were not recorded on all days in the year. Where there were gaps between measurements, lasting less than six days in length, the daily average on those days was assumed to be equal to the previous reading. If any gaps longer than six days were present, the daily measurement on those days was assumed to be equal to the 90th percentile of the 24-hr raw data set.*

PM_{10} is not a monitored contaminant by either the MOECC or Environment Canada, therefore ambient concentrations were estimated using the measured $PM_{2.5}$ ambient concentrations and a ratio of $PM_{2.5}$ / PM_{10} of 0.54, measured in an air quality study on ambient fine particulate concentrations published in the journal, Atmospheric Environment, issue 38 (2004), called "Estimation of historical annual $PM_{2.5}$ exposures for health effects assessment" (Lall et. al, 2004).

The background concentrations for each contaminant were also compared to the applicable Provincial and Federal concentration limits for all time averaging periods. Most contaminants were found to be below the applicable limits, with the exception of Benzene and Benzo(a)pyrene which exceeded the AAQC limits, as shown in **Table 3-10**.

Table 3-10: Comparison of Background Ambient Air Study Concentration and Criteria

Contaminant	Averaging Period (hr)	Background Concentration (µg/m³)	AAQC Standard (µg/m³)	CAAQS 2015 Standard (µg/m³)	CAAQS 2020 Standard (µg/m³)	% of AAQC/ CAAQS Standard
NO_2	1	46.1	400	-	-	12%
	24	40.1	200	-	-	20%
CO	1	458	36,200	-	-	1%
	8	458	15,700	-	-	3%
PM_{10}	24	33.0	50	-	-	66%

Table 3-10: Comparison of Background Ambient Air Study Concentration and Criteria

Contaminant	Averaging Period (hr)	Background Concentration (µg/m^3)	AAQC Standard (µg/m^3)	CAAQS 2015 Standard (µg/m^3)	CAAQS 2020 Standard (µg/m^3)	% of AAQC/ CAAQS Standard
$PM_{2.5}$	24	17.8	-	28	27	66%
	Annual	9.4	-	10	8.8	107%
Acetaldehyde	24	0.665	500	-	-	0%
Acrolein	1	0.026	4.50	-	-	1%
	24	0.026	0.40	-	-	7%
Benzene	24	2.12	2.30	-	-	92%
	Annual	***1.11***	***0.45***	***-***	***-***	***246%***
Benzo(a)pyrene	***24***	***0.0011***	***0.00005***	***-***	***-***	***2,170%***
	Annual	***0.001***	***0.00001***	***-***	***-***	***5,050%***
Formaldehyde	24	1.76	65	-	-	3%
1,3-Butadiene	24	0.071	10			1%
	Annual	0.043	2			2%

*Notes: Exceedances to air quality thresholds are shown in **bold**.*

It was assumed that the historic ambient air quality background level would be the same for the Existing Conditions (2016), Future No-Build and Future Build-Out (2032) Conditions. This is a conservative estimate as there are numerous Provincial and Federal initiatives in place to reduce levels of ambient air pollutants. It is also anticipated that increasingly stringent vehicle emission limits will lower on-road traffic emissions despite the anticipated rise in traffic volume.

A copy of the Air Quality Monitoring Data is provided in Appendix A of **Appendix B3**.

3.4 Noise and Vibration

Noise and vibration impacts were assessed, considering both the construction and operation of the Project. The Noise and Vibration Impact Assessment Report is provided in **Appendix B4** and describes the relevant assessment guidelines, methodologies and assumptions, along with predicted noise and vibration impacts.

3.4.1 Methods

3.4.1.1 Construction Noise

3.4.1.1.1 Construction Noise Assessment Criteria

The Ontario Ministry of Environment and Energy[2] (MOEE)/GO Transit *Draft Protocol for Noise and Vibration Assessment* (referred to herein as the MOEE/GO Transit Protocol; MOEE/GO Transit, 1995) notes that construction of a project shall be examined; and reference is given to the Model Municipal Noise Control By-law (MOE[3], 1978).

The Ontario noise pollution control publication NPC-115, Construction Equipment, included in the Model Municipal Noise Control By-law, sets requirements for sound power levels of individual construction equipment items. The Ontario noise pollution control publication NPC-118, Motorized Conveyances, included in the Model Municipal Noise Control By-law, sets requirements for heavy vehicles. The United States (US) Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment guide (FTA, 2006) is widely used as a

2. MOECC was known as the Ontario Ministry of the Environment and Energy from 1993 to 1997.
3. MOECC was known as the Ontario Ministry of the Environment from 1972 to 1993, and again from 1997 to 2014.

reference for construction noise and vibration impact assessment. The US FTA guide includes a residential daytime noise criterion of 80 dBA Leq, 8hr or a 70 dBA Leq, 8hr criterion for night-time work for detailed assessment purposes. Above these levels, noise control measures are recommended.

3.4.1.1.2 Construction Noise Assessment Methodology

Construction noise levels were predicted at noise sensitive areas using reference equipment source levels and estimated equipment quantities for the different stages of construction. The US Federal Highway Administration (FHWA) Roadway Construction Noise Model (FHWA, 2011) was used for this assessment. This model was developed as a construction noise screening tool and allows users to analyze multiple pieces of equipment simultaneously at multiple receptor locations using simplified prediction assumptions. The model uses an extensive database of equipment sound levels, but note that contractor's equipment may vary from these.

Construction noise impacts were assessed by comparing predicted construction noise levels with the MOEE/GO Transit Protocol objective sound levels for noise sensitive land uses. In order to keep the railway operating during the daytime, it is expected that substantial construction efforts will be undertaken at night.

The estimated equipment quantities used for the noise assessment are presented in Table 3-1 of **Appendix B4**. The construction source data for the equipment is presented in Table 3-2 of **Appendix B4**.

3.4.1.2 Construction Vibration

3.4.1.2.1 Construction Vibration Assessment Criteria

When assessing ground-borne vibration, there are typically two major concerns: building damage and potential to cause disturbance. Building damage is typically assessed using Peak Particle Velocity (PPV) vibration levels; and human perception (or disturbance) is typically assessed using Root Mean Square Velocity (RMSV) vibration levels.

The Model Municipal Noise Control By-law referenced in the MOEE/GO Transit Protocol does not include limits for construction vibration, however the City of Toronto has developed a construction vibration By-law (By-law 514), which was used for guidance in lieu of any local municipal construction vibration limits.

By-law 514 includes vibration limits not to be exceeded at ground level adjacent to any building:

- 8 mm/s at frequencies less than 4 Hz
- 15 mm/s at frequencies in the range 4-10 Hz
- 25 mm/s at frequencies higher than 10 Hz

The limits for vibration during construction are intended to avoid damage to buildings, including both cosmetic damage (such as hairline surface cracks) and structural damage. A factor of safety can be applied to the City of Toronto criteria for a conservative assessment to establish a vibration zone of influence, within which vibration levels would be at or greater than 5 mm/s PPV, according to the By-law. Structural building damage would typically be expected at much higher levels of vibration. For example, mortar joints are expected to fail at around 75 mm/s PPV and gypsum wallboard and plaster is expected to fail after many cycles at 25 mm/s PPV (City of Toronto, 2007).

Vibration levels below 0.1 mm/s RMSV are typically considered to be imperceptible to humans (ISO, 1985).

3.4.1.2.2 Construction Vibration Assessment Methodology

Construction vibration impacts were predicted using reference equipment source levels and estimated equipment operations. The US FTA's *Transit Noise and Vibration Impact Assessment* guide (FTA, 2006) includes procedures

for predicting vibration transmission. These procedures include a distance attenuation equation to estimate vibration levels from reference source levels, which provides a reasonable estimate for a wide range of soil conditions.

The reference vibration levels and the distance attenuation equation used for the vibration assessment are provided in Section 3.2.2 of **Appendix B4.**

3.4.1.3 Operational Noise

3.4.1.3.1 Operational Noise Assessment Criteria

In accordance with the MOEE/GO Transit Protocol, noise impacts from rail operations are evaluated by comparing noise levels with the completed Project and without the Project. No long-term track alignment or profile changes are anticipated as part of the Project. In addition, RWDI have assessed potential noise and vibration impacts from the GO Expansion Program, as documented in their report *GO Rail Network Electrification TPAP Final Noise/Vibration Modelling Report – Lakeshore West Corridor* dated September 20, 2017. Their assessment includes predicted noise and vibration levels at the nearest residential receptor to the grade crossing (receptor R10 in the RWDI report).

The MOEE/GO Transit Protocol requires that if a rail project may produce a road traffic noise impact, road traffic noise impacts are to be assessed in accordance with methods approved for Environmental Assessments of road projects. Therefore, road traffic noise was assessed using the MTO/Ontario Ministry of Environment[4] (MOE) document *A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments* (referred to herein as the MTO/MOE Protocol; MTO/MOE, 1996).

Under the MTO/MOE Protocol, noise mitigation requirements are assessed based on road traffic noise impacts typically ten (10) years post-construction between 07:00 hours and 23:00 hours. The noise impact due to the Project is defined as the change in noise level above ambient within the outdoor living area of noise sensitive areas. The future ambient noise levels are taken as the traffic noise levels with no road improvements (“Future No Build”). The future noise levels with the Project are taken as the traffic noise levels with the road improvements implemented (“Future Build”).

Under the MTO/MOE Protocol, noise mitigation investigations are required where noise impacts are predicted to be greater than 5 dB. Any proposed noise mitigation measures shall achieve a minimum noise reduction of 5 dB; and reduce traffic noise levels to the objective outdoor sound level of 55 dBA Leq, 16hr or the future ambient (whichever is greater).

3.4.1.3.2 Operational Noise Assessment Methodology

Road traffic noise levels were predicted using the US FTA’s Traffic Noise Model (TNM) Version 2.5 as opposed to the MOECC’s Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT). Although ORNAMENT is typically appropriate for straightforward road geometries, there are several aspects that cannot be modelled with the method. TNM has previously been authorized by the MTO for assessments where there is complexity of the road alignment, site layout and topography. Given the relatively complex geometry of the road with the grade separation (with elevation changes, profiled screening attenuation and reflection effects), the use of TNM is considered to be appropriate and is expected to provide more accurate results than ORNAMENT.

4. Ontario Ministry of Environment is now known as Ontario Ministry of the Environment and Climate Change.

The prediction model inputs include the following:

- Road traffic data
  - Volumes
  - Speed limit
  - Vehicle composition (percentage Medium and Heavy Trucks)
- Ground characteristics
  - Road surface type (e.g., asphalt, concrete, or 'average')
  - Ground topography
  - Ground type between assessment locations and roads
  - Road layout
- Shielding effects
  - Berms
  - Barriers
  - Buildings

Sensitive receptors were visually identified using aerial and street photography. Two (2) sample receptors were selected to represent the worst case noise exposure from Project operations. The identified noise sensitive areas and representative receptors are shown in Figure 2-1 of **Appendix B4**. One (1) sample receptor (R1) is the closest sensitive property to the proposed rail / road grade separation, and the other (R2) is the closest sensitive property to Burloak Drive.

The traffic data inputs used for the vibration assessment are provided in Table 3-4 of **Appendix B4**.

3.4.1.4 Operational Vibration

No long-term track alignment or profile changes are anticipated as part of the Project, so no change in individual train pass-by vibration levels are expected.

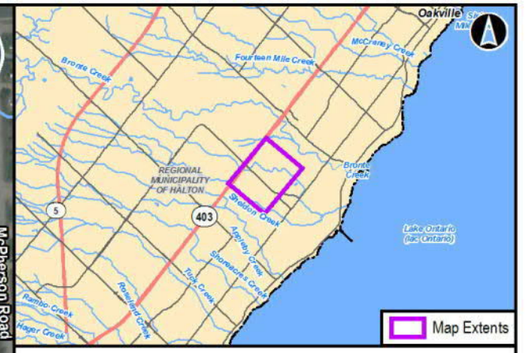
A road traffic vibration assessment is not included in this report because the rubber tires and suspension systems of road vehicles provides vibration isolation and impacts are not expected from operating on a continuous road surface. Most vibration or groundborne noise problems are related directly to discontinuities in the road surface (e.g., potholes, bumps, or expansion joint). Since the Project will remove the at-grade crossing, the discontinuities in the road will be eliminated at this location.

3.4.2 Description of Existing Conditions

Existing noise conditions in the Study Area are dominated by the activities of people: mostly from road traffic, particularly from Burloak Drive, but also background from Highway 403, which is approximately 500 m north of the Study Area. Other sources of noise in the Study Area include activities at the industrial facilities on both sides of Harvester Road and at the commercial buildings on Burloak Drive. Existing noise from operations on the Lakeshore West Rail Corridor include train pass-bys and audible warning devices (bells) used at the existing at-grade crossing.

3.5 Socio-Economic and Land Use Characteristics

A Socio-Economic and Land Use Characteristics Study was conducted to identify the current socio-economic and land use conditions within the Assessment Area and assess any potential effects the Project may have on those features. The Socio-Economic and Land Use Characteristics Report can be found in **Appendix B5**. The Assessment Area is shown in **Figure 3-7**.



Legend

- Study Area
- Socio-Economic and Land Use Area of Investigation and Assessment (300m)
- Permanent Watercourse
- Intermittent Watercourse
- Railway

0 50 100 200 300 400
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Socio-Economic Assessment Area

Dec, 2016	1:6,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	

AECOM

Figure 3-7

The existing conditions of the following socio-economic features were reviewed and described:

- Community features
  - Neighbourhoods
- Existing land use
  - Residential
  - Commercial
  - Industrial
  - Employment areas
  - Institutional
  - Recreational
  - Parks and open space
- Aesthetics/visual character
- Property requirements
- Utilities
  - Watermains and Sewers
  - Pipelines and gas
  - Hydro and street lighting
  - Communications
- Transportation
  - Road traffic volumes and operations
  - Public transit service
  - Active transportation

3.5.1 Methodology

A desktop review was conducted using applicable regional and municipal documents (i.e., Official Plans, Transportation Master Plans, Transit System Maps) and online data sources (i.e., current development applications), including their associated maps/mapping tools, to identify the current land use designations and existing socio-economic conditions within the Assessment Area (**Section 1.4 Table 1-1**). This background research was supplemented with field reconnaissance conducted on October 12, 2016 to verify the data collected during the initial desktop review and document additional socio-economic features within the Assessment Area.

3.5.2 Description of Existing Conditions

3.5.2.1 Community Features

3.5.2.1.1 City of Burlington

The portion of the Assessment Area located in the City of Burlington (i.e., west of Burloak Drive) is within Ward 5. According to 2006 Census Data (Community Development Halton, 2010), Ward 5 has a total population of 31,610, with the largest age demographic being 25 to 44 years old (36.9%). Ward 5 is predominantly Canadian-born (75.3%) with 90.8% of the population speaking English as their only language.

Pinedale

Pinedale is a neighbourhood located between Burloak Drive and Appleby Line, north of New Street and south of the Queen Elizabeth Way (QEW). The east end of this neighbourhood is located within the Assessment Area. Pinedale is considered to be an affordable area in South Burlington and is comprised of predominantly single-family detached homes built in the late 1960s and early 1970s with some newly constructed homes from the 1990s into the early 2000s. Pinedale also offers a mixture of semi-detached homes, townhomes, and condominium apartment buildings. The new grade separation may be visible from residences located in the northeast section of the townhouse development on the north side of Prince William Drive.

There are many amenities within the neighbourhood, including commercial and retail plazas with coffee shops, restaurants, banks, convenience stores, and other retailers. The very east of Pinedale (closest to Burloak Drive) is home to Sherwood Forest Park.

Data related to population and demographic information could not be found for Pinedale.

3.5.2.1.2 Town of Oakville

The portion of the Assessment Area located in the Town of Oakville (i.e., east of Burloak Drive) is within Ward 1. According to 2006 Census Data (Community Development Halton, 2010), Ward 1 has a total population of 18,375, with the largest age demographic being 45 to 64 years old (28.1%). Ward 1 is predominantly Canadian-born (73.1%) with 87.9% of the population speaking English as their only language.

The 2006-2011 Census Population by Community shows that there are no residences located within the Oakville portion of the Assessment Area.

Lakeshore Woods Community of Bronte

The Lakeshore Woods Community of Bronte is located south of Rebecca Street between Burloak Drive and Bronte Road, and comprises much of the southwest portion of Oakville. The community has a mix of land uses, such as residential and commercial, as well as an abundance of parks and open space. Bronte is easily accessible to residents and visitors by Lakeshore Road West, QEW/Highway 403, and Bronte GO Station. Bronte Creek (formerly Twelve Mile Creek) bisects the community and feeds into Lake Ontario. As a former fishing village, Bronte has notable public spaces that have been preserved as parkland, including Bronte Heritage Park and Bronte Outer Harbour Marina.

Bronte Village Residents Association

The Bronte Village Residents Association (BVRA) is an active non-profit association that aims to encourage community activities and provide a forum for the discussion of issues affecting the community's interests (BVRA, 2017). The BVRA's area of interest is north of the Assessment Area in Oakville, bound by Burloak Drive to the west, North Service Road to the north, Third Line to the east and Lake Ontario to the south. The BVRA speaks on behalf of the entire community and works with the Town of Oakville on issues such as development and planning, traffic and transportation, recreational facilities and programs, safety, municipal by-laws, and community affairs.

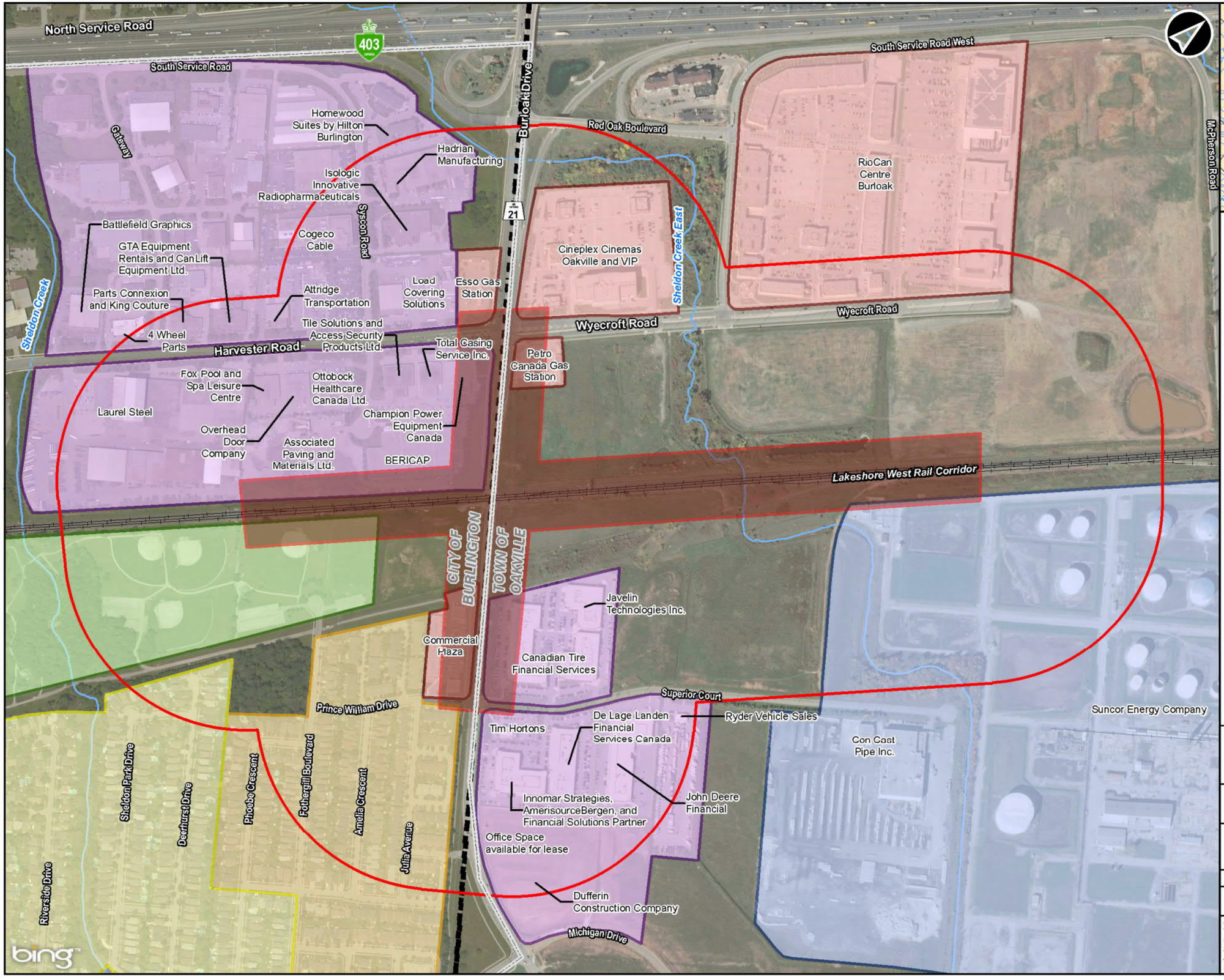
3.5.2.2 Existing Land Use

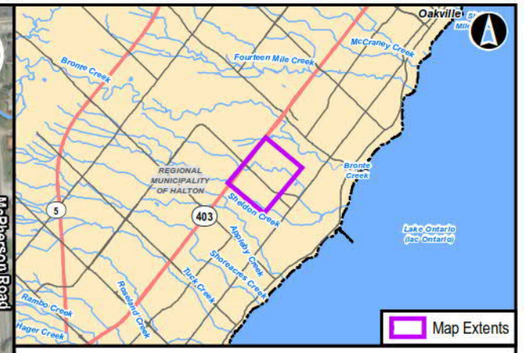
Socio-economic features within the Assessment Area are presented in **Figure 3-8**. The land use west of Burloak Drive in Burlington is currently a mix of employment areas, and both industrial and commercial uses north of the Lakeshore West Rail Corridor, with residential homes and parkland south of the Lakeshore West Rail Corridor. Land use east of Burloak Drive in Oakville is primarily commercial land and open space north of the Lakeshore West Rail Corridor, with two (2) locations that have not been developed, and employment areas south of the Lakeshore West Rail Corridor.

There are no institutional sensitive receptors (e.g., schools, daycares, long-term care facilities) within the Assessment Area. Sensitive receptor generally refers to any point on the premises of a person where sound or vibration is received which originated from somewhere else. There are permanent residential sensitive receptors in the Pinedale neighbourhood, but there are no hotels/motels, nursing/retirement homes, hospitals, camp grounds, or noise-sensitive buildings such as schools and places of worship in the Assessment Area.

3.5.2.2.1 Residential

There is one (1) medium-density residential area within the Assessment Area, located in Burlington, comprised of townhomes and semi-detached houses in the Pinedale neighbourhood. This residential area is located on Prince William Drive immediately west of the retail plaza on Burloak Drive and south of Sherwood Forest Park and some of the homes have direct views of the existing Burloak Drive at-grade crossing.





Legend

- Study Area
- Socio-Economic and Land Use Characteristics Assessment Area (300m)
- Permanent Watercourse
- Intermittent Watercourse
- Municipal Boundary
- Railway

Socio-Economic Features

- Commercial
- Employment Area
- Industrial Area
- Low-Density Residential Area
- Medium-Density Residential Area
- Sherwood Forest Park
- Pinedale Neighbourhood Boundary

0 50 100 200 300 400
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Socio-Economic Features

Aug, 2017	1:6,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	

AECOM

Figure 3-8

There is also one (1) low-density residential area within the Assessment Area, located in Burlington, comprised of single-detached houses in the Pinedale neighbourhood. This residential area is located on Phoebe Crescent, Deerhurst Drive, and Sheldon Park Drive at the western extent of the Assessment Area, immediately west of the above-noted medium-density residential area. The existing Burloak Drive at-grade crossing is not visible from these homes, as the trees south of Sherwood Forest Park provide a screening buffer.

3.5.2.2.2 Commercial

The following commercial uses are found within the Assessment Area:

- Esso gas station located on the northwest corner of Burloak Drive and Harvester Road (right-in / right-out entrance from Burloak Drive and all-moves entrance from Harvester Road);
- A commercial plaza located on the northwest corner of Burloak Drive and Prince William Drive, including various fast-food restaurants and beauty salons, as well as a fitness centre and a pet hospital (right-in / right-out entrance from Burloak Drive and all-moves entrance from Prince William Drive);
- RioCan Centre Burloak retail complex located on the north side of Wyecroft Road, including outlet stores, grocery stores, fast-food restaurants, and banks (all-moves access from Wyecroft Road); and
- Petro Canada gas station located on the southeast corner of Burloak Drive and Wyecroft Road (right-in / right-out entrance from both Burloak Drive and Wyecroft Road).

There is a vacant standalone building (previously TD Canada Trust) available for lease on the north side of Wyecroft Road within the RioCan Centre. On South Service Road east of Wyecroft Road there is an undeveloped property available for a design-build lease opportunity through Melrose Investments Inc.

3.5.2.2.3 Industrial

There are two (2) industrial uses located south of the Lakeshore West Rail Corridor within the Assessment Area. Con Cast Pipe Inc. is located at the eastern extent of Superior Court with driveway access on the south side of the street. Suncor Energy Company owns lands located within the Assessment Area, east of Superior Court and Sheldon Creek East. These lands are located on both sides of the Lakeshore West Rail Corridor, with access from McPherson Road on the north side and Rebecca Street on the south side. Both accesses are located outside of the Assessment Area.

There are also industrial uses outside of the Assessment Area (e.g., Zeton Pilot Plant Technology Inc.) that use Burloak Drive to access the QEW. Zeton Pilot Plant Technology Inc. is a global industrial company with its Canadian head office located on Oval Court in Burlington. Although the company is outside of the Assessment Area, its staff has advised that Zeton Pilot Plant Technology Inc. trucks use Burloak Drive for oversize loads of crated modular laboratories, pilot plants and demonstration scales, as Burloak Drive is the only current access route to the QEW without physical cargo height restrictions.

3.5.2.2.4 Employment Areas

The following employment areas were identified within the Assessment Area:

- Laurel Steel located south of Harvester Road (with no entrance from Burloak Drive);
- Cogeco Cable buildings located north of Harvester Road (with no entrance from Burloak Drive);
- Complex with Cineplex Cinemas and chain restaurants, including Kelsey's, Swiss Chalet, Harvey's, Montana's, and Milestones, located at the northeast corner of Burloak Drive and Wyecroft Road;

- Canadian Tire Financial Services Group (CTFSG) and Javelin Technologies Inc. located north of Superior Court (with no entrance from Burloak Drive);
- Tim Hortons restaurant and offices, including Innomar Strategies, AmerisourceBergen, and Financial Solutions Partner, located southeast of Burloak Drive and Superior Court;
- Ryder Vehicle Sales, Dufferin Construction, and John Deere Financial located on the south side of Superior Court;
- Load Covering Solutions, Isologic Innovative Radiopharmaceuticals, Hadrian Manufacturing, and Homewood Suites by Hilton Burlington located on the east side of Syscon Road; and
- Tile Solutions and Access Security Products Ltd., Total Casing Solutions, Champion Power Equipment Canada, BERICAP, Associated Paving and Materials Ltd., Fox Pool and Spa Leisure Centre, Overhead Door Company, and Ottoblock Healthcare Canada Ltd. located on the south side of Harvester Road.

3.5.2.2.5 Institutional

There are no institutional uses located within the Assessment Area.

3.5.2.2.6 Recreational

Sherwood Forest Park is located west of Burloak Drive, immediately south of the Lakeshore West Rail Corridor. Fothergill Boulevard becomes a no-exit road, ending at Sherwood Forest Park. The park is categorized as recreational with a variety of amenities, including baseball diamonds, artificial turf soccer field, other sports fields, concession stand, playground, washrooms, recreational trail, and open space parkland. There is an existing multi-use path along the south side of Sherwood Forest Park that ends at Burloak Drive within the Study Area.

In September 2016, the City of Burlington Development and Infrastructure Committee (City of Burlington, 2016) approved the Sherwood Forest Park Revitalization Plan as the framework to guide future capital renewal to park and building infrastructure. As part of the improvements, the City of Burlington reconstructed Ball Diamond D4 within the Park (located both in the Study Area and Assessment Area). The improvements included the complete removal and replacement of baseball fencing and sports lights. As part of the reconstruction work, the ball diamond was re-aligned to achieve a consistent width of buffer to the property line on the north side. These improvements were undertaken from August 2016 to April 2017.

There is an existing multi-use path that runs along the east side of Burloak Drive from Prince William Drive / Superior Court to Michigan Drive / Great Oaks Boulevard that continues southerly along the east side of Great Lakes Boulevard.

3.5.2.2.7 Parks and Open Space

The main parkland feature within the Assessment Area is Sherwood Forest Park, described above.

There is also a strip of open space that runs north-south on the east side of Burloak Drive on both sides of the Lakeshore West Rail Corridor. Sheldon Creek East flows through this open space beneath the Lakeshore West Rail Corridor.

3.5.2.3 Development Applications and Planning Policy

3.5.2.3.1 Province of Ontario

Provincial Policy Statement (April 2014)

The Provincial Policy Statement (PPS) is the statement of the Ontario government's policies on land use planning. Key policy directives include the efficient use of land and infrastructure, the protection of the environment and its resources, and ensuring that there are opportunities for employment and residential development.

This Project is consistent with the objectives of the PPS that call for transportation, transit and infrastructure facilities to be planned to meet current and projected needs, providing for an efficient, cost-effective and reliable multi-modal transportation system that supports long-term economic prosperity.

The PPS also indicates that:

- Public transit and other alternative modes of transportation are to be supported to improve energy efficiency and air quality.
- Investments in transit infrastructure must support a range of planning, transportation and economic development objectives. While improvements to the GO Transit network will help reinforce the function of infrastructure corridors, these transit investments must simultaneously support multiple modes of travel, foster improved connectivity, and allow for the development of compact, vibrant, and mixed-use communities.

3.5.2.3.2 Halton Region

Regional Official Plan (September 2015 Interim Office Consolidation)

The primary role of the Regional Official Plan is to provide broad policy directions on strategic matters, including growth strategies, with the requirement of the local municipalities (in this case, City of Burlington and Town of Oakville) to adhere to the overall planning vision for the Region. The entire Assessment Area is located within Halton Region and is therefore governed by this Plan.

According to the September 2015 Interim Office Consolidation of the Halton Regional Official Plan and its amendments (Halton Region, 2015), the Regional Official Plan identifies the entire Assessment Area as 'Urban Area' with lands east of Burloak Drive also designated as 'Employment Area'. It is important to note that the Regional Plan's mapping illustrates 'Employment Area' as an overlay on top of the 'Urban Area', therefore these lands are also subject to the objectives and policies for the 'Urban Area' designation.

The objectives for lands within the 'Urban Area' are to:

- Accommodate growth in accordance with the Region's desire to improve and maintain regional unity, retain local community identity, create healthy communities, promote economic prosperity, maintain a high quality, sustainable natural environment, and preserve certain landscapes permanently;
- Support a form of growth that is compact and supportive of transit usage and non-motorized modes of travel, reduces the dependence on the automobile, makes efficient use of space and services, promotes live-work relationships and fosters a strong and competitive economy; and
- Provide for an appropriate range and balance of employment uses including industrial, office and retail and institutional uses to meet long-term needs.

The objectives for lands located within the 'Employment Area' are to:

- Ensure the availability of sufficient land for employment to accommodate forecasted growth to support Halton Region and its Local Municipalities' economic competitiveness;
- Provide, in conjunction with those employment uses within the residential and mixed use areas of the communities, opportunities for a fully-diversified economic base, including maintaining a range and choice of suitable sites for employment uses which support a wide range of economic activities and ancillary uses, and take into account the needs of existing and future businesses; and
- Locate Employment Areas in the vicinity of existing major highway interchanges and rail yards, where appropriate, within the Urban Area.

The Regional Official Plan includes a section called Healthy Communities Policies, which contains general policies that apply to all land use decisions made in Halton. Under these Healthy Communities Policies, the goal for Transportation is to provide a safe, convenient, accessible, affordable, and efficient transportation system in Halton, while minimizing the impact on the environment and promoting energy efficiency. More specifically, the Official Plan objectives of the Region are to:

- Develop a transportation system that will encourage Regional unity and satisfy inter-regional transportation demands;
- Support seamless public transit service that includes continuous enhancements of the GO Transit system within Halton; and
- Support a safe and efficient railway network for the movement of goods and people.

In addition to the Transportation objectives, the Regional Official Plan identifies a policy to support the provision of a safe and efficient railway network by securing grade separations of railways and arterial roads, where warranted.

The Regional Official Plan provides specific policies which commit to supporting Metrolinx in its regional transportation enhancement by requiring the Region's transportation system to meet current and future travel demands, consistent with the appropriate recommendations of the Metrolinx Regional Transportation Plan (RTP) and any inter-regional transportation network environmental assessment. The Regional Official Plan also notes a policy to support and invest, in partnership with the Province, Metrolinx and other upper-tier or single-tier municipalities in the GTHA, in the continuous service and network enhancement of the Provincial GO Transit system.

According to the Regional Official Plan, there are no 'Constraints to Development' identified within the Assessment Area (e.g., Greenbelt Natural Heritage System, Parkway Belt Transportation and Utility Corridors, Municipal Wellhead Protection Zones, Prime Agricultural Areas, or Identified Mineral Resource Areas).

Regional Construction Projects

According to the Region's online database for Regional Construction Projects, there is one (1) active project (under construction) within the Study Area along Burloak Drive. The Zone 1 Watermain Project in the City of Burlington and Town of Oakville involves tunnelling a 1800 mm and 1500 mm watermain along Rebecca Street, Great Lakes Boulevard, Burloak Drive, Upper Middle Road (easement), and Colonel William Parkway from Burloak Water Purification Plant to Kitchen Reservoir. It is anticipated that this project will be completed in Spring 2018.

Based on consultation with Halton Region in November 2017, it was noted that the following Regional construction projects are planned to occur within the Study Area and Assessment Area:

- A new 600 mm watermain is planned for construction from the intersection of Burloak Drive and Wyecroft Road, heading east along Wyecroft Road. The planned start date for design and construction is 2024.
- A new pumping station (i.e., the Burloak Zone 2 Pumping Station) is planned for construction northwest of the intersection of Burloak Drive and Wyecroft Road. The planned start date for design and construction is 2026.
- The planned start of construction for the widening of Burloak Drive (Regional Road 21) between Harvester Road and Upper Middle Road from four (4) lanes to six (6) lanes is scheduled for 2029.

3.5.2.3.3 City of Burlington

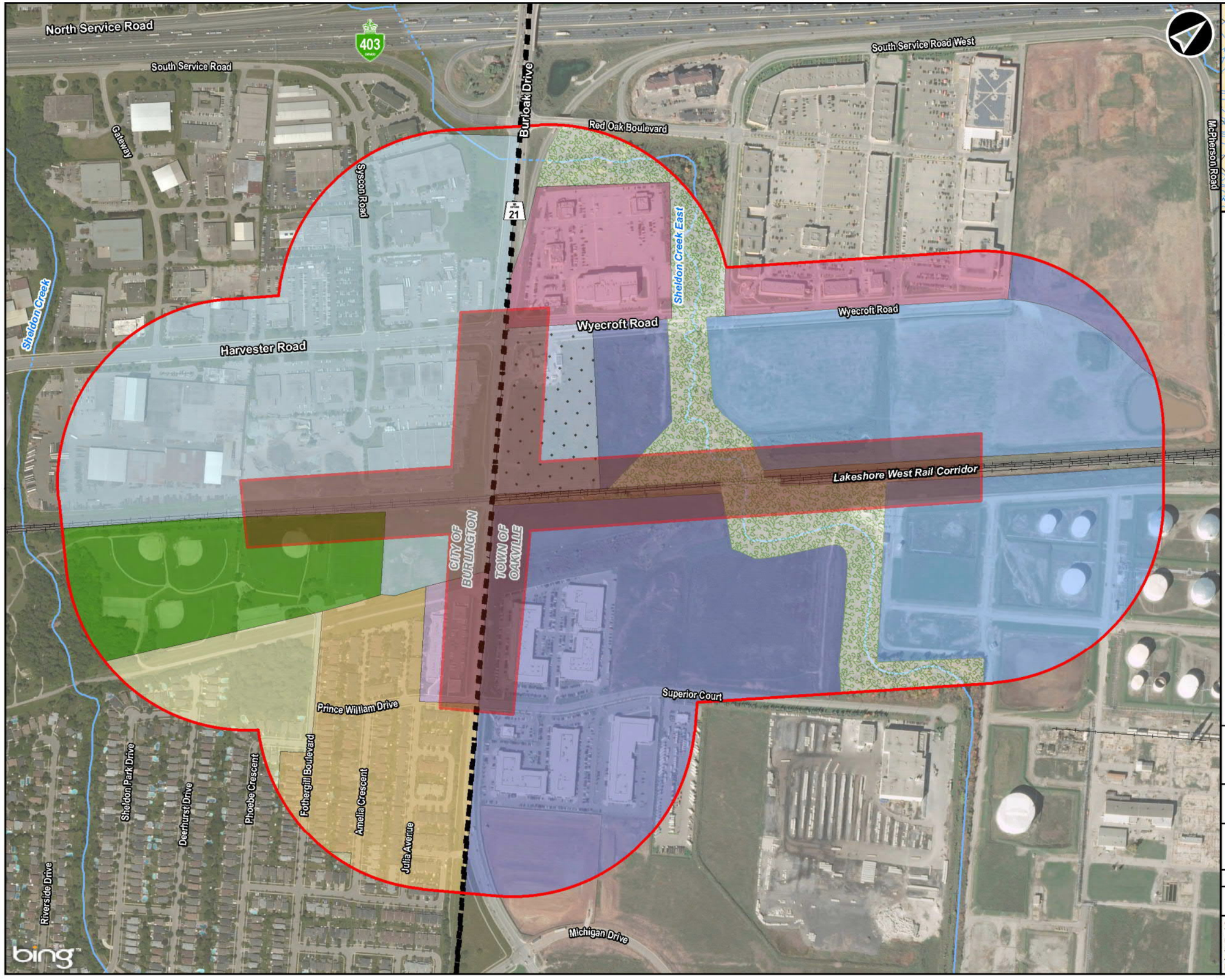
Official Plan (July 2015 Office Consolidation)

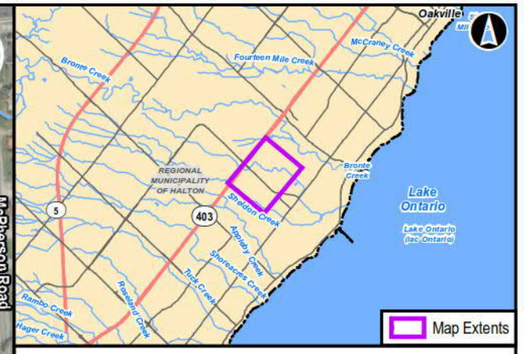
The portion of the Assessment Area west of Burloak Drive is located within the City of Burlington and is therefore governed by its Official Plan. There are no existing Secondary Plans or Special Policy Areas affecting the Assessment Area.

According to the July 2015 Office Consolidation of the Burlington Official Plan (City of Burlington, 2015), the lands within the Assessment Area that are located along the west side of Burloak Drive and north of the Lakeshore West Rail Corridor are designated as 'General Employment'. The lands located immediately south of the Lakeshore West Rail Corridor and west of Burloak Drive are designated as 'Major Parks and Open Space' (Sherwood Forest Park). Additionally, there is a mix of 'General Employment', 'Neighbourhood Commercial', with 'Residential – Low Density' and 'Residential – Medium Density' located further south. These land use designations are visually represented in **Figure 3-9**.

The main objective of the 'General Employment' designation is to provide locations in the City for a broad range of employment and office uses, and to separate these uses from sensitive land uses, particularly residential, in order to minimize potential negative effects; however, small-scale 'General Employment' areas with low-intensity industrial uses and offices with a limited effect on the surrounding environment may be located close to other land uses, including residential, without significant conflicts through appropriate site plan design features. Land uses permitted in this designation include: industrial uses that involve assembling, fabricating, manufacturing, processing, warehousing and distribution uses, repair activities, communications, utilities, transportation, storage, service trades and construction uses; office uses; research and information processing; recreational uses; large scale motor vehicle dealerships; and adult entertainment uses. A limited range of retail uses such as convenience stores, and a limited range of service commercial uses such as restaurants and banks are permitted if they are ancillary to, and primarily serve, the uses, businesses, and employees within the surrounding employment area.

The main objective of the 'Neighbourhood Commercial' designation is to provide opportunities for limited neighbourhood commercial centres within and at the periphery of residential neighbourhoods in locations that meet residents' day-to-day and weekly goods and service needs. Small-scale neighbourhood commercial areas are intended to provide a limited range of retail and service commercial uses and community facilities that serve the daily and weekly needs of the immediate neighbourhood, and large-scale neighbourhood commercial areas serve the surrounding residential community. This land use designation is meant to promote compatibility between the neighbourhood commercial area and adjacent land uses (most often residential).





Legend

- Study
- Socio-Economic and Land Use Characteristics Assessment Area (300 m)
- Permanent Watercourse
- Intermittent Watercourse
- Municipal Boundary
- Railway

Municipal Official Plan Land Use Designations

City of Burlington (June 2015)

- General Employment
- Major Parks and Open Space
- Neighbourhood Commercial
- Residential - Low Density
- Residential - Medium Density

Town of Oakville (Feb 2015)

- Business Commercial
- Business Employment
- Core Commercial
- Industrial
- Natural Area

0 50 100 200 300 400
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Land Use Designations

Apr. 2017	1:6,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-9**

AECOM

The 'Residential – Low Density' designation is described as single-detached and semi-detached housing units with a maximum density of 25 units per net hectare. Other forms of ground-oriented attached housing may be permitted, provided the maximum density requirements are not exceeded and the forms are compatible with the scale, urban design, and community features of the neighbourhood.

The 'Residential – Medium Density' designation is described as housing units with a density ranging between 26 and 50 units per net hectare comprised of single detached and semi-detached homes, townhouses, street townhouses, stacked townhouses, back-to-back townhouses, attached housing and walk-up apartments.

The 'Major Parks and Open Space' designation is intended for community- and city-wide parks and other public and private open space lands. This designation consists of Parkettes, Neighbourhood Parks, Community Parks, City Wide Parks, and Special Resource Areas within the municipal parks system. This designation also permits municipal parks and related community facilities, golf courses and related facilities, and outdoor recreation uses. The Official Plan notes that a high priority shall be placed on environmental protection, public safety, public access and increased visibility along streets during the detailed design and development of parks.

Under Functional Policies – Transportation, the Official Plan states that the City's transportation planning efforts will be co-ordinated with Regional, Provincial and Federal transportation priorities and initiatives. More specifically with regard to Rail policies, the Official Plan states that the assistance of Federal, Provincial and other agencies will be sought in identifying areas where existing rail lines create significant barriers to pedestrian access, or to the development of a continuous network of roads. Once identified, the City will examine such areas for possible improvements, including developing additional grade separations.

Development Applications

According to the City's online database for Current Development Projects, there is one (1) active development application within the Assessment Area (Emshih Developments Inc.) located at 700 and 800 Burloak Drive. The site, located between Sherwood Forest Park and Burloak Drive immediately south of the Lakeshore West Rail Corridor, is proposed to become a large-scale neighbourhood commercial shopping area. This proposal was first initiated in 2004 (File 535-13/05; related to Official Plan Amendment application file 4-505-06/04 and Rezoning application file 520-11/04) and is currently "on hold" as the City of Burlington is waiting for additional materials.

3.5.2.3.4 Town of Oakville

Official Plan (February 2015 Office Consolidation)

The portion of the Assessment Area east of Burloak Drive is located within the Town of Oakville and is therefore governed by its Official Plan. There are no existing Secondary Plans or Special Policy Areas affecting the Assessment Area.

According to the February 2015 Office Consolidation of the Livable Oakville Plan (Town of Oakville, 2015), lands within the Assessment Area are designated as 'Business Employment', 'Industrial', and 'Natural Area' both north and south of the Lakeshore West Rail Corridor. In addition, there are also 'Business Commercial' and 'Core Commercial' designations on the north side only. These land use designations are visually represented in **Figure 3-9**. The Official Plan categorizes the 'Business Commercial', 'Business Employment', and 'Industrial' designations under a broader 'Employment' designation.

The Official Plan states that 'Core Commercial' areas provide major concentrations of commercial facilities serving the broader regional community and are to be located at the intersection of major arterial roads with proximity to highway access. Permitted uses include a range of retail and service commercial uses including restaurants, food stores, and motor vehicle service stations. Large format retail, retail warehouse, entertainment, and recreational uses may also be permitted. Offices and motor vehicle repair facilities may be permitted, provided they serve a secondary function within the 'Core Commercial' designation and are small in scale.

'Business Commercial' areas provide for service commercial and convenience retail uses to support the surrounding employment areas and the travelling public. These areas apply primarily to existing service commercial uses along major arterial roads (i.e., Burloak Drive). Uses permitted in this designation include hotels, offices, public halls, training facilities and commercial schools, motor vehicle-related uses, convenience retail and service commercial uses, including restaurants.

'Business Employment' areas are intended to provide for a wide range of business and industrial uses, predominately within enclosed buildings, and to provide for light and service industrial operations with minimal impacts on the surrounding areas. Uses permitted in this designation may include offices and light industrial uses such as manufacturing, assembling, processing, fabricating, repairing, warehousing and wholesaling. Banquet halls, meeting halls and convention centres, and training facilities and commercial schools may also be permitted. Accessory uses may be permitted in conjunction with permitted light industrial uses.

'Industrial' areas are intended to provide for heavy industrial operations and are limited to well screened, highly accessible locations. Uses permitted within this designation may include light industrial, heavy industrial operations such as manufacturing, assembling, processing, fabricating, refining, repairing, warehousing, and wholesaling. Additional uses including outdoor storage may be permitted; training facilities and commercial schools where they are related to and supportive of an industrial use, waste processing station, waste transfer station, or transportation terminal may also be permitted. 'Industrial' areas may also include direct access to a transportation terminal and railway spur lines.

The purpose of the 'Natural Area' designation is for the long-term preservation of natural features and functions through a diverse and connected system, including surface water and groundwater features. The natural features may also have some passive recreational amenity for paths, trails, and education, and contribute to a continuous open space system. The following land uses may be permitted within the Natural Area designation, subject to applicable Conservation Authority policies: legally existing uses; buildings and structures including existing agricultural uses; fish, wildlife and conservation management including forestry management; essential public works including transportation, utility, watershed management, and flood and erosion control facilities; and passive recreation features such as trails, walkways and bicycle paths.

The 'Transportation' section of the Official Plan provides general policies relating to Oakville's transportation network, which consists of the existing and proposed road network for use by automobiles, buses, pedestrians, cyclists, and trucks, as well as rail facilities and off-road pedestrian and cycling facilities. The general intent is to provide a safe, efficient, and accessible transportation system, and to foster the use and development of a sustainable transportation network. The Official Plan states that additional rights-of-way may be required at railway crossings to provide for future grade separations where warranted. The 'Transportation' section of the Official Plan also states as a general objective under the 'Rail' subsection that the Town will progressively grade separate at-grade railway crossings with a high exposure index[5] in order to minimize and alleviate conflicts with the railway network, adjacent land uses and the road network.

Development Applications

According to the Town's online database for Active Development Applications, there is currently one (1) active development application within the Assessment Area located at 3421 Superior Court (File 1635.014/02) to construct at new one-story office building east of CTFSG.

5. *Exposure index is a standard measure of determining where grade separations are needed, and is calculated by multiplying the number of vehicles per day by the number of trains per day. Grade separations are considered where the exposure index exceeds a threshold of 200,000 (Livable Oakville Plan, 2015, S. 29.5).*

There is also an approved site plan application immediately southeast of the Assessment Area to construct three (3) single story buildings for employment lands (offices and industrial uses) at 529 Michigan Drive (File 1635.010/02).

3.5.2.4 Aesthetics / Visual Character

A significant portion of the Assessment Area is comprised of various built forms, including commercial malls/plazas, office buildings, and light industrial buildings. The most notable aesthetic views are the greenery at Sherwood Forest Park and the open space surrounding Sheldon Creek East. Users of Sherwood Forest Park, especially at the east end of the park, have direct views of the existing Burloak Drive at-grade crossing.

The existing Burloak Drive at-grade crossing is visible from the following locations within the Assessment Area, as shown in **Figure 3-10**:

A) Sherwood Forest Park (**Figure 3-11**);

B) Townhouses located on Prince William Drive, directly abutting the multi-use path south of Sherwood Forest Park (**Figure 3-12**);

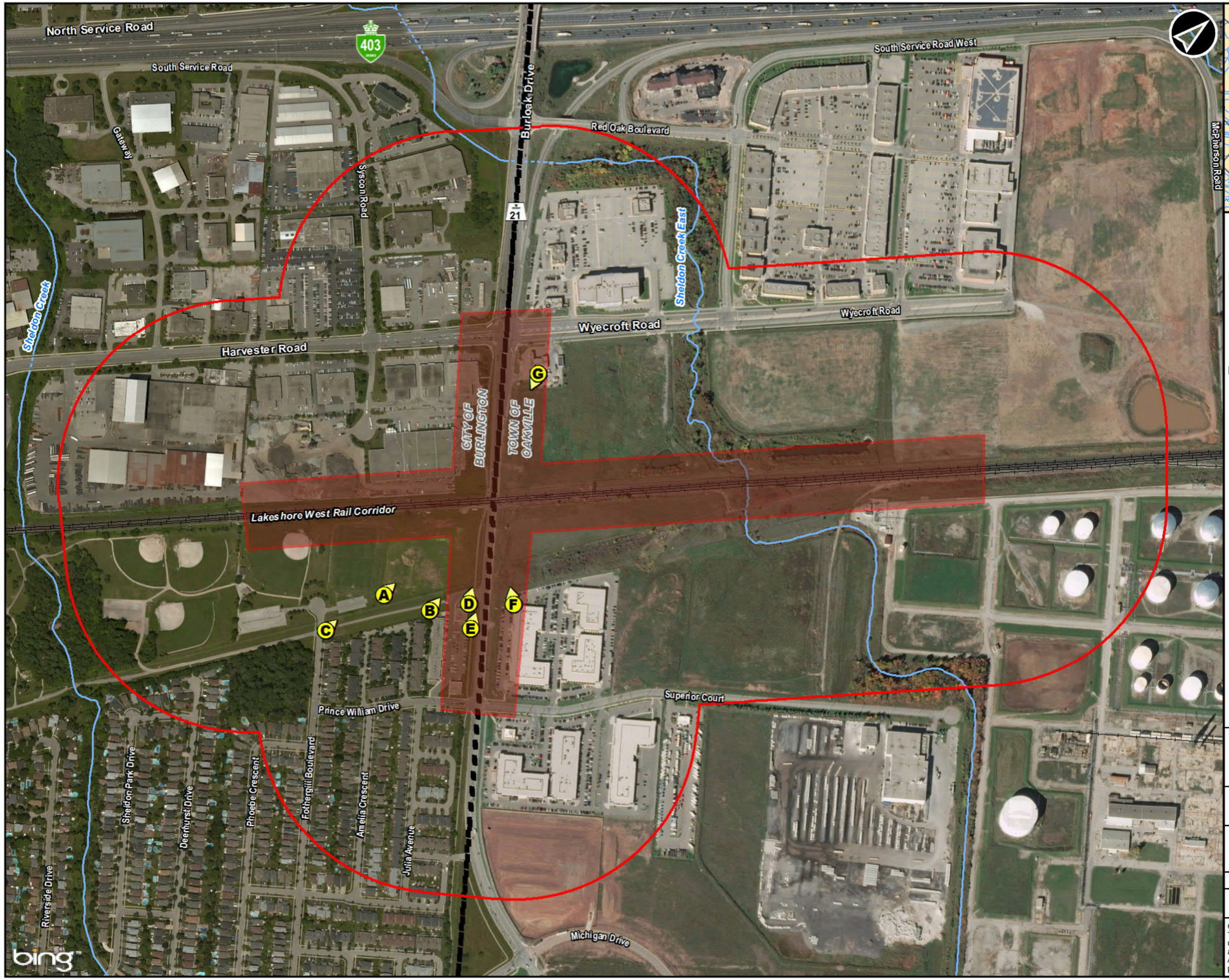
C) Single-detached houses on Fothergill Boulevard, directly abutting the multi-use path south of Sherwood Forest Park (**Figure 3-13**);

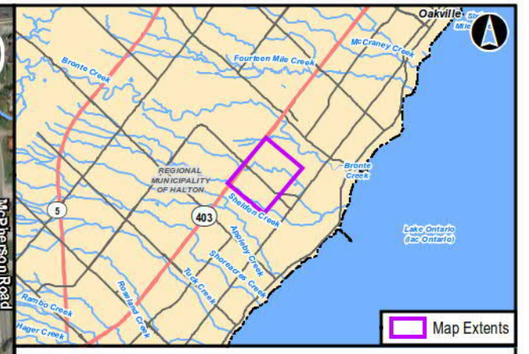
D) Kudo Sushi restaurant entrance, located in the commercial plaza on the west side of Burloak Drive (**Figure 3-14**);

E) South St. Burger restaurant patio, located in the commercial plaza on the west side of Burloak Drive (**Figure 3-15**);

F) North entrance of CTFSG on the north side of Superior Court (**Figure 3-16**); and

G) Petro Canada gas station on the south side of Wyecroft Road (**Figure 3-17**).





Legend

- Study Area
- Socio-Economic and Land Use Characteristics Assessment Area (300m)
- Permanent Watercourse
- Intermittent Watercourse
- Railway
- Municipal Boundary
- Location Point and Direction of Aesthetics/Visual Character Photos (Figures 3-11 to 3-17)

0 50 100 200 300 400
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Views of Existing Burloak Drive At-Grade Rail Crossing

Sep, 2017	1:6,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-10**

AECOM

Figure 3-11: View of Existing Burloak Drive Rail Crossing from East Boundary of Sherwood Forest Park, facing Northeast

Figure 3-12: View of Existing Burloak Drive Rail Crossing from Fence Line of Townhouse on Prince William Drive, facing Northeast

Figure 3-13: View of Existing Burloak Drive Rail Crossing from Fence Line of Single-Detached House on Fothergill Boulevard, facing Northeast

Figure 3-14: View of Existing Burloak Drive Rail Crossing from Kudo Sushi Restaurant Entrance, facing Northeast

Figure 3-15: View of Existing Burloak Drive Rail Crossing from South St. Burger Restaurant Patio, facing Northeast

Figure 3-16: View of Existing Burloak Drive Rail Crossing from Canadian Tire Financial Services Group, facing Northwest

Figure 3-17: View of Existing Burloak Drive Rail Crossing from Petro Canada Gas Station, facing Southwest

3.5.2.5 Property

In the current 4-lane configuration of Burloak Drive, all properties within the Assessment Area have full access to/from Burloak Drive. Property impacts and temporary access restrictions as a result of the Project are described in **Section 4.6.4**.

3.5.2.6 Utilities

There are a number of underground and overhead utilities within the Study Area, including a Regionally-owned watermain, privately-owned oil pipelines, privately-owned high voltage overhead power service cables, and privately-owned communications services in various forms (i.e., fibre optics, overhead cables, steel casting pipe).

3.5.2.6.1 Watermains and Sewers

Halton Region is undertaking a watermain tunneling project between the Kitchen Reservoir south along Burloak Drive to the Burloak Water Purification Plant south of Rebecca Street. Construction commenced during the summer of 2015 and is expected to be completed in winter of 2018. The portion of the watermain within the vicinity of the existing Burloak Drive at-grade crossing has been constructed.

In addition to the above, there are existing watermains located at the Harvester Rd. / Wyecroft Rd. and Prince William Dr. / Superior Ct. intersections.

There are existing storm and sanitary sewers located at the Harvester Rd. / Wyecroft Rd. and Prince William Dr. / Superior Ct. intersections. There is also an existing 375 mm Dia. PVC sanitary pipe within a 1350 mm Dia. tunnel liner crossing the Lakeshore West Rail Corridor at approximately Mi. 26.62.

3.5.2.6.2 Pipelines and Gas

There are three (3) underground oil pipelines crossing the Lakeshore West Rail Corridor within the Assessment Area at approximately Mi. 26.56, which service the Suncor Energy Company facility south of the Lakeshore West Rail Corridor.

There are existing natural gas feed pipes within the Study Area located at the existing at-grade crossing which service the snow clearing devices associated with the Burloak Interlocking Plant. These feed pipes are connected to a carrier pipe just west of the at-grade crossing, which runs north-south on the west side of Burloak Drive.

In addition, there is a TNPI oil pipeline south of the Burloak Drive at-grade crossing which carries diesel, gas and jet fuel.

3.5.2.6.3 Hydro and Street Lighting

The following high voltage overhead power services cross the Lakeshore West Rail Corridor within the Assessment Area:

- Burlington Hydro Electric Commission;
- Hydro One Networks Inc. (HONI); and
- Oakville Hydro Electricity Distribution Inc.

In addition, there is a HONI corridor south of the existing Burloak Drive at-grade crossing, which consists of multiple aerial high voltage power lines that cross Burloak Drive.

There is existing street lighting located on the east side of Burloak Drive which is fed via underground power cables in conduit. There is also street lighting on the west side of Burloak Drive which is attached to the overhead hydro poles and fed via overhead power cables.

3.5.2.6.4 Communications

The following communication services cross the Lakeshore West Rail Corridor within the Assessment Area:

- Allstream (fibre optic cable);
- Bell Canada (overhead cable and steel casting pipe);
- Blink Communications (overhead fibre optic cable); and
- Cogeco Cable Canada (fibre optic cable).

3.5.2.7 Transportation

3.5.2.7.1 Road Traffic Volumes and Operations

The following existing key intersections were assessed in the Traffic Impact Assessment (**Appendix B8**):

1. Burloak Drive and Highway 403/QEW eastbound off-ramp / Red Oak Boulevard (Jurisdiction: Halton Region);
2. Burloak Drive and Harvester Road / Wyecroft Road (Jurisdiction: Halton Region);
3. Burloak Drive and Prince William Drive / Superior Court (Jurisdiction: City of Burlington); and
4. Burloak Drive and Michigan Drive / Great Lakes Boulevard (Jurisdiction: Town of Oakville).

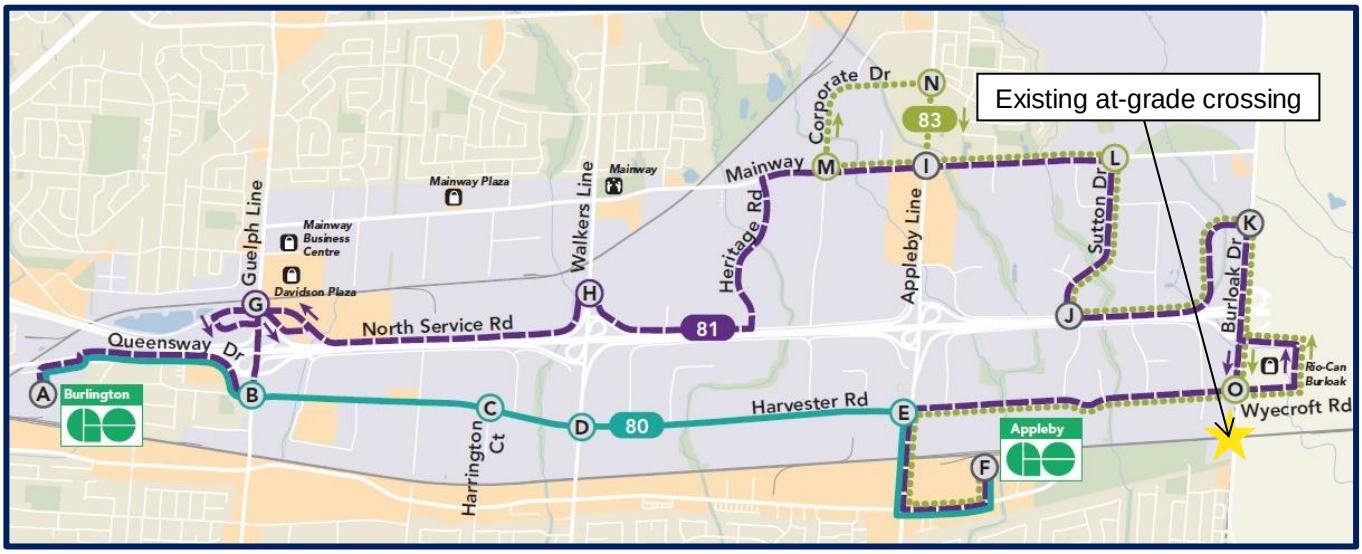
A capacity and level of service (LOS) analysis was conducted to determine the existing road traffic conditions at the four (4) key intersections. In general, the results found that all the key intersections in the Assessment Area currently operate at an acceptable LOS service.

3.5.2.7.2 Public Transit Service

City of Burlington

Burlington Transit Routes 81 and 83 travel along Harvester Road and Wyecroft Road within the Assessment Area, looping at the RioCan Centre commercial outlet plaza on the north side of Wyecroft Road, as shown in **Figure 3-18**.

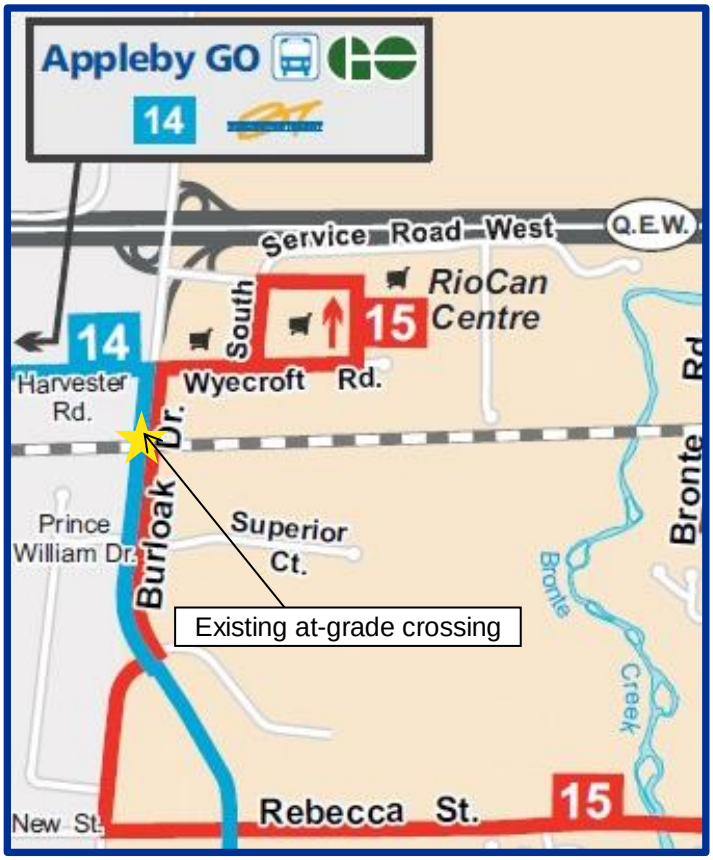
Figure 3-18: Burlington Transit Routes within the Assessment Area



Town of Oakville

Oakville Transit Routes 14 and 15 travel along Burloak Drive, with Route 14 heading west on Harvester Road and Route 15 heading east on Wyecroft Road to loop at RioCan Centre on the north side of Wyecroft Road, as shown in **Figure 3-19**. Within the Assessment Area, Burloak Drive is serviced only by Oakville Transit.

Figure 3-19: Oakville Transit Routes within the Assessment Area



3.5.2.7.3 Active Transportation

Existing and Planned Infrastructure

Halton Region

The Halton Region Active Transportation Master Plan (May 2015) designates the cycling and sidewalk facilities on Burloak Drive as existing Regional infrastructure. In addition, the Regional Master Plan identifies existing and planned bike routes of Regional significance on Wyecroft Road and Burloak Drive south of Wyecroft Road, though not on Regional roads. The Regional Master Plan also identifies a Regionally significant pedestrian facility on Wyecroft Road.

City of Burlington

The City of Burlington Cycling Master Plan (July 2009) identifies the following existing bike lanes and trails: "Existing Bike Lane" on Burloak Drive and "Existing Multi-use Path" along the south side of Sherwood Forest Park north of Prince William Drive.

In addition, the Master Plan identifies a "Proposed Bike Lane" on Harvester Road and a "Proposed Multi-use Path" on Burloak Drive in the short term (2009 to 2015). The Master Plan also identifies the existing multi-use path at Sherwood Forest Park and Burloak Drive for "Intersection Improvement" in the short term (2009 to 2015). In 2018, an updated City of Burlington Master Cycling Plan will be released.

Town of Oakville

The Town of Oakville Active Transportation Master Plan (September 2009) identifies an "Existing Multi-use Trail (Off-Road – In Boulevard)" on Burloak Drive south of Wyecroft Road.

In addition, the Master Plan identifies a "Proposed Bike Lane (On-Road)" on Wyecroft Road and on Burloak Drive north of Wyecroft Road for mid-term implementation (6 to 10 years). Both of these routes are identified as a "Prime (Spine) Route" within the transportation route network hierarchy.

In addition to the above-noted cycling facilities, the Oakville Master Plan identifies a "Proposed Sidewalk Connection (Sidewalk on both sides of the street)" on Wyecroft Road and a "Proposed Sidewalk Connection (Sidewalk on one side of the street)" on Burloak Drive, both to be implemented mid-term (6 to 10 years). The Master Plan also identifies a "Proposed Regional Sidewalk Connection" north of Wyecroft Road in the short-term (0 to 5 years).

The Oakville Master Plan also identifies the rail crossing at Burloak Drive as a "Constraint/Barrier" for pedestrian and cyclist movement.

Pedestrian and Cyclist Counts

In June 2017, pedestrian and cyclist counts on Burloak Drive were conducted at 15-minute intervals between 7:00 AM and 7:00 PM on one weekday (Thursday, June 22, 2017) and one weekend day (Saturday, June 24, 2017). Additional details related to the methods and results of this analysis are described in the Traffic Impact Assessment (**Appendix B8**).

The results found that there were more pedestrians during the weekday, with more southbound pedestrians than northbound pedestrians on both weekday and weekend days.

The peak hours for cyclists occurred during the weekday morning between 8:00 AM to 9:00 AM and the weekday afternoon between 3:00 PM to 4:00 PM; however, the weekend day, most of the cyclist movements occurred during the first half of the day with a peak between 9:00 AM to 12:00 PM.

3.6 Cultural Environment

3.6.1 Built Heritage and Cultural Heritage Landscapes

3.6.1.1 Methodology

A field review of the Study Area was conducted in October 2016 to identify recognized and potential built heritage resources and cultural heritage landscapes of 40 years or older within the Study Area. A Cultural Heritage Screening Report (CHSR) is provided in **Appendix B6**. The properties are identified to determine where further assessment may be required as part of a Cultural Heritage Evaluation Report (CHER). Properties with no potential are screened out of the cultural heritage assessment process. For the purposes of this CHSR, the Assessment Area was defined as extending 30 m from the Study Area.

Metrolinx undertakings have the potential to impact Cultural Heritage Resources[6] (CHRs) through Project activities. In response to this, Metrolinx developed an internal heritage methodology to address potential impacts to CHRs. The Metrolinx Interim Cultural Heritage Management Process (2013) involves four steps:

- Step 1: Cultural Heritage Screening (e.g., preparation of a CHSR);
- Step 2: Cultural Heritage Evaluation (e.g., preparation of a CHER report);
- Step 3: Interim Cultural Heritage Management; and
- Step 4: Review and Approval for Metrolinx Heritage Properties of Provincial Significance.

The purpose of the CHSR is to identify all known or potential cultural heritage resources within a Study Area that may be impacted by a specific project. This involves pre-screening all properties that Metrolinx owns, controls, or plans to acquire to identify properties that are 40 or more years old. All known and potential CHRs are identified during this stage using a screening checklist, and are identified as:

- Potential Provincial Heritage Property (PHP), where the property is owned or occupied by Metrolinx, and the answer to at least one screening question is “yes” (except age);
- Conditional Heritage Property (CHP), where the property is not owned or occupied by Metrolinx, and the answer to at least one screening question is “yes” (except age);
- Adjacent Land (Adjacent) where a known and protected heritage property is adjacent to the study area; or
- Non-heritage Property, where the property does not meet any of the screening criteria.

The CHSR also includes a preliminary review of the heritage attributes of each potential CHR and an initial assessment of impacts. The screening results in one of four outcomes for an assessed CHR, as follows:

- Where a property is deemed a Non-heritage Property, it is eliminated from further review;
- Where it is clear that no heritage attributes will be affected, the CHR is also eliminated from further review;

---

6. *The term Cultural Heritage Resource (CHR) is used to describe both built heritage resources (BHR) and cultural heritage landscapes (CHL).*
   Built heritage means one or more significant buildings (including fixtures or equipment located in or forming part of a building), structures, monuments, installations, or remains associated with architectural, cultural, social, political, economic, or military history and identified as being important to a community.
   Cultural heritage landscape means a defined geographical area of heritage significance that human activity has modified and that a community values. Such an area involves a grouping(s) of individual heritage features, such as structures, spaces, archaeological sites, and natural elements, which together form a significant type of heritage form distinct from that of its constituent elements or parts. Heritage conservation districts designated under the Ontario Heritage Act, villages, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trails, and industrial complexes of cultural heritage value are some examples.

- Where there is likelihood that the heritage attributes could be directly affected, CHERs are completed to further confirm the heritage value of the Potential PHPs and CHPs; and
- Where there is potential for heritage attributes to be indirectly affected, CHERs are not immediately completed; however, the property is flagged for further assessment during detailed design.

Impacts to properties are defined as:

- **Direct**: A direct impact would have a permanent effect on the cultural heritage value or interest of a property or result in the loss of a heritage attribute on all or part of the Provincial Heritage Property. For example: removal or demolition of a building or structure in all or part of the structure, including individual heritage attributes.
- **Indirect**: An indirect impact would be the result of an activity on or near the property that may affect its cultural heritage value or interest and/or heritage attributes, but it does not affect the use of the building or physically alter any heritage attribute. For example: isolation of a Provincial Heritage Property from its surrounding environment, context or a significant relationship, or vibration damage to a structure due to construction.

In addition to the Metrolinx Interim Cultural Heritage Management Process, Metrolinx has established a heritage committee, which includes independent third party heritage experts based on the *Ontario Heritage Act (OHA)* Standards and Guidelines for the Conservation of Provincial Heritage Properties (2010) to administer this process and ensure that decisions affecting Cultural Heritage are made in a transparent, accountable, and responsible way.

More details on the screening process and results of the data collection are presented in the CHSR (**Appendix B6**).

3.6.1.2 Description of Existing Conditions

As summarized in **Table 3-11**, the CHSR initially identified eight (8) Built Heritage Resources (BHR) within the Study Area.

Of these eight (8) BHRs, the screening process did not identify any Conditional Heritage Properties, Potential Provincial Heritage Properties, or Protected Properties within or adjacent to the Study Area. As a result, the completion of CHERs was not recommended for any of the properties assessed in the CHSR.

3.6.2 Archaeology

3.6.2.1 Methodology

AECOM completed a Stage 1 Archaeological Assessment (AA) using background research to describe the geography, land use history, previous archaeological field work and current condition of the lands within the Assessment Area. The Archaeology Assessment Area is defined as extending 30 m from the edge of the Study Area to create a slightly larger area of investigation (**Table 1-1**) which is required to allow for slight variances.

A previous Stage 1 AA was completed by Archaeological Services Inc. (ASI) in 2003, which covered the northern section of the current Study Area at Harvester Road and Burloak Drive within the ROW. This area was considered clear of further archaeological concern, although further Stage 2 AA would be required for any areas outside of the ROW. A Stage 1 AA was also completed by Archeoworks Inc. in 2008 which assessed the eastern portion of Burloak Drive. This area was recommended for a Stage 2 AA, which was completed in 2010. No archaeological resources were recovered and the area was cleared of further archaeological concern. In addition, a Stage 1 AA field review was completed by AECOM in October, 2016. The Stage 1 AA is provided in **Appendix B7**.

Table 3-11: Summary of CHSR and CHERs

Mi.	Resource Name / Municipal Address	Heritage Resource Category (BHR / CHL)	Existing Heritage Recognition	CHSR Outcome	CHSR Recommendation for CHERs	Direct or Indirect Impact	CHER Outcome / Next Steps
26.96	3475 Superior Court, Oakville	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	700-738 Burloak Drive, Burlington	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	Sheldon Creek East Tributary Bridge	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	Sheldon Creek East Tributary Culvert	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	835 Syscon Court, Burlington	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	5530 Harvester Road, Burlington	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	845 Burloak Drive, Oakville	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A
26.96	3549 Wyecroft Road, Oakville	BHR	None	Is not a Potential Provincial Heritage Property or Conditional Heritage Property	No CHER Required	N/A	N/A

In July 2017, Metrolinx received a letter from the Ministry of Tourism, Culture and Sport (MTCS) confirming its satisfaction that the field work and reporting for the Stage 1 AA are consistent with MTCS's 2011 *Standards and Guidelines for Consultant Archaeologists* and the terms and conditions for archaeological licences. As such, the Stage 1 AA was entered into the Ontario Public Register of Archaeology Reports.

3.6.2.2 Description of Existing Conditions

The results of the Stage 1 AA indicate that, while the majority of the lands within the Study Area, including the existing Lakeshore West Rail Corridor ROW, appear to have been disturbed by past construction of the railway and commercial development, there are portions which still retain archaeological potential. This is based on the presence of historic homesteads, the proximity of historic roads and railway, other archaeological sites and certain physiographic features in proximity to the Study Area including Sheldon Creek. The Stage 1 AA recommends the completion of a Stage 2 AA; these areas are shown in **Figure 3-20**.

3.7 Traffic and Transportation

A Traffic Impact Assessment Report (**Appendix B8**) was completed to assess and identify the potential effects to road traffic operations, transit service, and active transportation, including bicycling and pedestrians, associated with construction and operation phases of the Project. The Assessment Area (as shown in **Figure 3-21**) is comprised of the ROW on Burloak Drive between the Highway 403/QEW eastbound off-ramp / Red Oak Boulevard to the north and Michigan Drive / Great Lakes Boulevard to the south. The Assessment Area also extends east and west along the Lakeshore West Rail Corridor up to the construction limit.

3.7.1 Methodology

The existing conditions of the following traffic elements were reviewed and assessed:

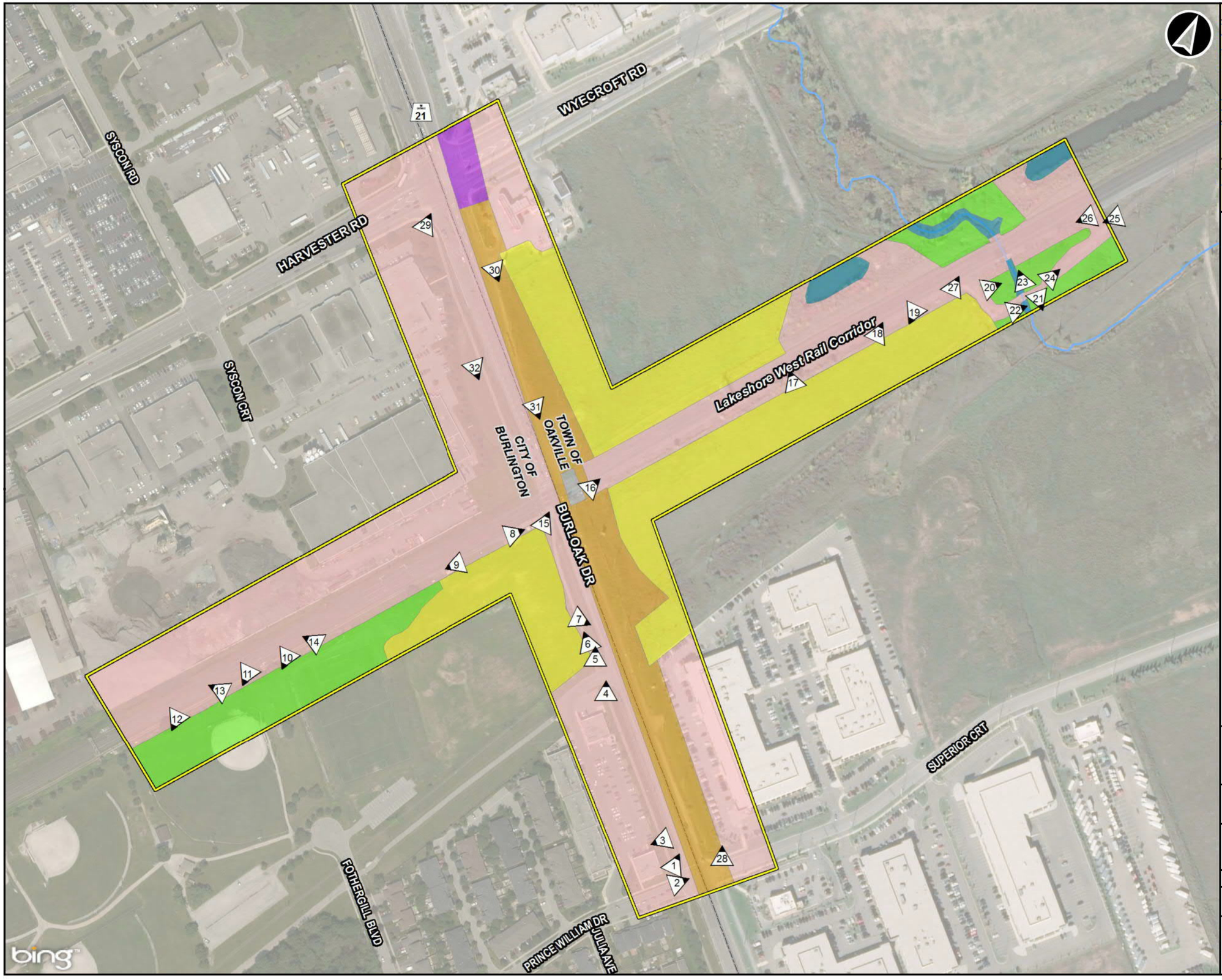
- Road Network
  - Traffic volumes
    - Average Annual Daily Traffic (AADT)
    - Intersection Turning Movements
  - Traffic Operations
- Transit Network
- Cycling, Pedestrian and Trail Network

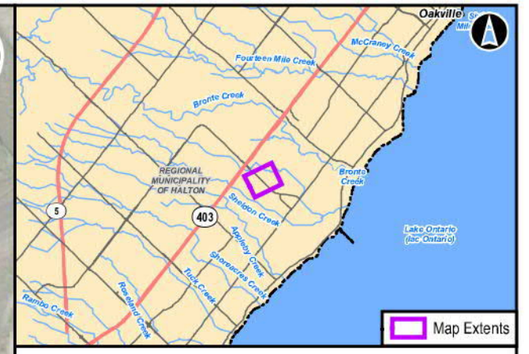
In order to assess the road network, transit network, and cycling, pedestrian and trail network, various methods of data collection were required, including, turning movements and recorded traffic volumes; cycling and pedestrian counts; and signal timing plans. These methods of data collection are described in more detail below.

3.7.1.1 Turning Movements and Bi-directional Vehicular Traffic Volumes

Turning Movement Count (TMC) data was collected at 15-minute intervals at the following key intersections on Thursday, January 19, 2017 between 7:00 AM and 10:00 AM and between 4:00 PM and 7:00 PM to identify the AM and PM peak hour traffic volumes. The traffic data collected classified the vehicles as cars, trucks or heavy vehicles.

1. Burloak Drive and Highway 403/QEW East Ramp Terminal (Jurisdiction: Halton Region);
2. Burloak Drive and Harvester (Wyecroft Road) (Jurisdiction: Halton Region);
3. Burloak Drive and Superior Court (Prince William Drive) (Jurisdiction: City of Burlington); and
4. Burloak Drive and Michigan Drive (Great Lakes Boulevard) (Jurisdiction: Town of Oakville).





Legend

- Photo location
- Watercourse
- Municipal boundary
- Stage 1 archaeological assessment (AA) study area

Stage 1 Archaeological Assessment (AA) Areas

- Previously assessed, Archeoworks Inc (2010), no further work required
- Previously assessed, Archaeological Services Inc (2003), no further work required
- Deeply disturbed, no further work required
- Pedestrian survey at 5m intervals potentially required
- Test pitting survey at 5m intervals potentially required
- Permanently wet - no archaeological potential

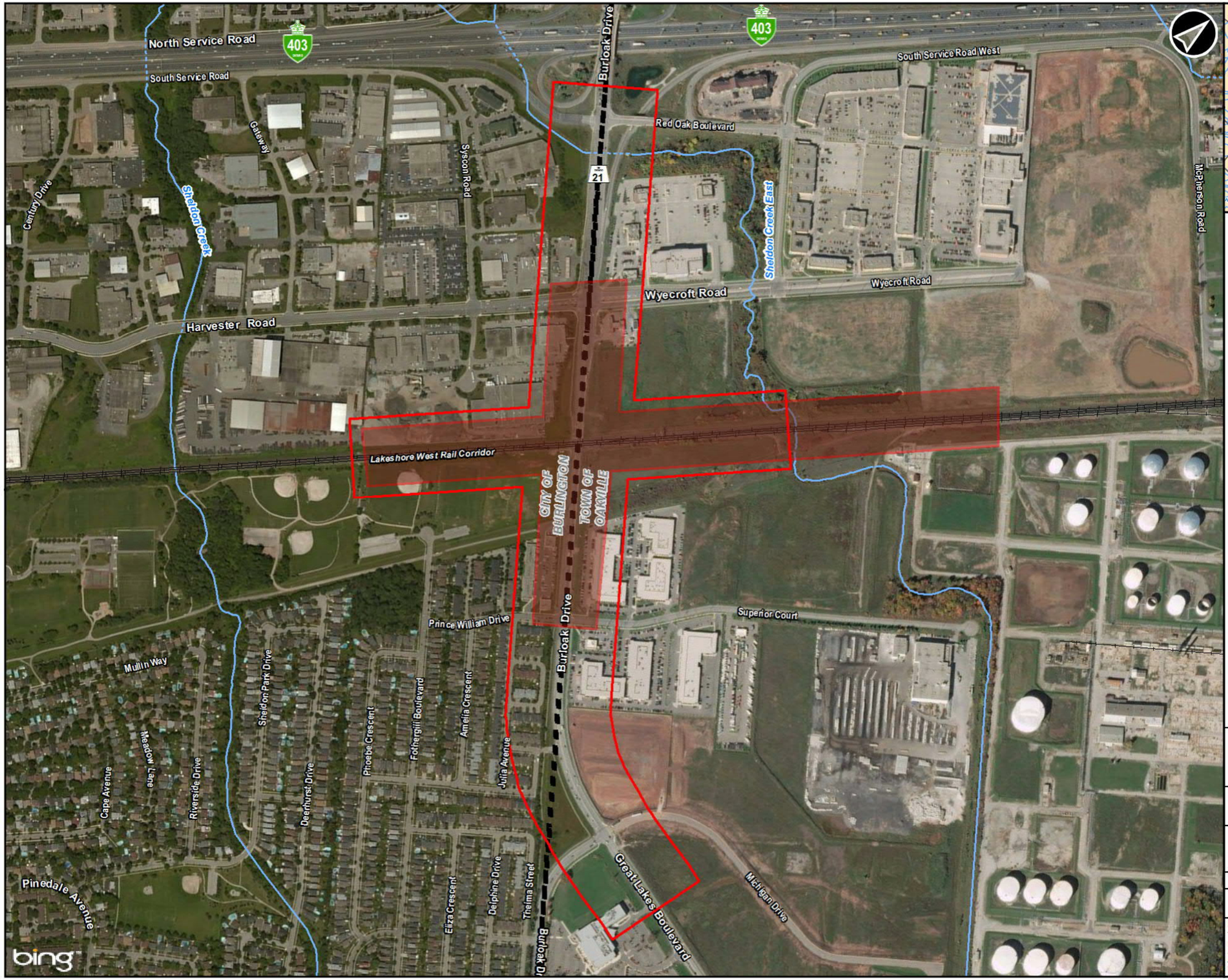
0 25 50 100 150 200
Metres

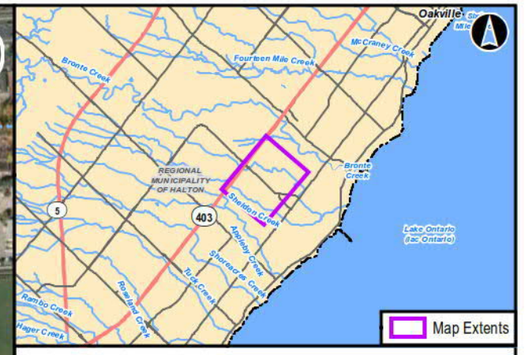
Burloak Drive Grade Separation TPAP
Environmental Project Report

Stage 1 Archaeological Assessment Results

Feb, 2017	1:3,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-20**

AECOM





Legend

- Study Area
- Traffic Assessment Area
- Permanent Watercourse
- Intermittent Watercourse
- Railway
- Municipal Boundary

0 50 100 200 300 400 500
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Traffic Assessment Area

Apr, 2017	1:7,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-21**

AECOM

In addition, Automatic Traffic Recorder (ATR) data was collected utilizing pneumatic road tube counters at Burloak Drive immediately south of the railway tracks over a seven-day period. The ATR data was collected from 12:00 AM on Tuesday, January 17, 2017 to 12:00 AM on Tuesday, January 24, 2017. The data was recorded in 15 minute intervals.

3.7.1.2 Cyclist and Pedestrian Counts

Using video technology, the number of northbound and southbound cyclists and pedestrians travelling along Burloak Drive across the tracks at a point immediately to the south of the tracks were counted. Cyclist and pedestrian counts were collected on January 19, 2017; however, it was decided that these counts would be conducted again when the weather was more favourable for walking and cycling. The counts were therefore again conducted between 7:00 AM and 7:00 PM on one (1) weekday (Thursday, June 22, 2017) and one (1) weekend day (Saturday, June 24, 2017). The data was collected in 15-minute intervals on sunny days, which encourage pedestrian and cyclist activity.

3.7.1.3 Signal Timing Plans

Current signal timing plans were obtained for the four (4) signalized intersections listed in **Section 3.7.1.1** from the City of Burlington and Town of Oakville. The signal timing plans provided information regarding the operations of the traffic signals for weekdays, Saturdays and Sundays/holidays, and for various time periods throughout the day.

3.7.2 Description of Existing Conditions

3.7.2.1 Road Network

As shown in **Figure 3-21**, the Assessment Area is comprised of the ROW on Burloak Drive between the Highway 403/ QEW eastbound off-ramp / Red Oak Boulevard to the north and Michigan Drive / Great Lakes Boulevard to the south. The Assessment Area extends approximately 30 m on either side of the edge of the Burloak Drive ROW to include portions of the following key roads:

- Burloak Drive
- Highway 403/QEW eastbound off-ramp
- Red Oak Boulevard
- Harvester Road/Wyecroft Road
- Prince William Drive/Superior Court
- Great Lakes Boulevard
- Michigan Drive

Burloak Drive is a Regional 6-lane undivided paved arterial road between the Highway 403/QEW eastbound off-ramp / Red Oak Boulevard and Harvester Road and then it becomes a 4-lane road south of Harvester Road (City of Burlington, 2015).

Highway 403 / QEW eastbound off-ramp is a 2-lane exit ramp from eastbound Highway 403/QEW. There is one (1) dedicated left-turn lane, one (1) right-turn lane, one (1) through-lane and one (1) shared through and right-turn lane at the intersection with Burloak Drive (City of Burlington, 2015).

Red Oak Boulevard is a local road with two (2) lanes eastbound and one (1) lane westbound (City of Burlington, 2015). The westbound lane is a right-turn only lane.

Harvester Road / Wyecroft Road is a 4-lane undivided multi-purpose arterial road (City of Burlington, 2015). The road is named as Harvester Road to the west of Burloak Drive and Wyecroft Road to the east of Burloak Drive. There is one (1) dedicated left-turn lane, two (2) through-lanes and one (1) dedicated right-turn lane at both the eastbound and westbound approaches of the intersection with Burloak Drive. Harvester Road is a key arterial road that runs in the east-west direction, parallel to Highway 403/QEW, and provides access to the commercial and industrial developments along the road including access to Appleby GO Station.

Prince William Drive / Superior Court is a 2-lane undivided collector road (City of Burlington, 2015). The road is named as Prince William Drive to the west of Burloak Drive and Superior Court to the east of Burloak Drive. There is one (1) dedicated left-turn lane and one (1) shared through/right-turn lane at both the eastbound and westbound approaches of the intersection with Burloak Drive.

Great Lakes Boulevard is a 2-lane minor arterial road that starts near the southern end of the Assessment Area as a continuation of Burloak Drive (City of Burlington, 2015). At Michigan Drive, Burloak Drive splits with one part of the road veering southwesterly as Burloak Drive and the other part continuing southeasterly as Great Lakes Boulevard. The section of Great Lakes Boulevard between Rebecca Street and Michigan Drive is currently being widened to a 4-lane arterial road (scheduled for completion in early December 2017).

Michigan Drive is a 2-lane undivided local road (City of Burlington, 2015). The road is under construction and ends with a cul-de-sac. The area along the road is not yet fully developed.

Figure 3-22 identifies the following existing key intersections:

1. Burloak Drive and Highway 403/QEW eastbound off-ramp / Red Oak Boulevard (Jurisdiction: Halton Region);
2. Burloak Drive and Harvester Road / Wyecroft Road (Jurisdiction: Halton Region);
3. Burloak Drive and Prince William Drive / Superior Court (Jurisdiction: City of Burlington); and
4. Burloak Drive and Michigan Drive / Great Lakes Boulevard (Jurisdiction: Town of Oakville).

The proposed grade separation at the Burloak Drive crossing of the Lakeshore West Rail Corridor is located approximately 290 m south of the Burloak Drive and Harvester Road / Wyecroft Road intersection and approximately 350 m north of the Burloak Drive and Prince William Drive / Superior Court intersection. Appleby GO Station is the nearest GO Station, located on Harvester Road approximately 2 km west of the Assessment Area.

Detailed lane arrangements and traffic controls at the existing key intersections are presented in Figure 3-1 of **Appendix B8**.

3.7.2.1.1 Traffic Volumes

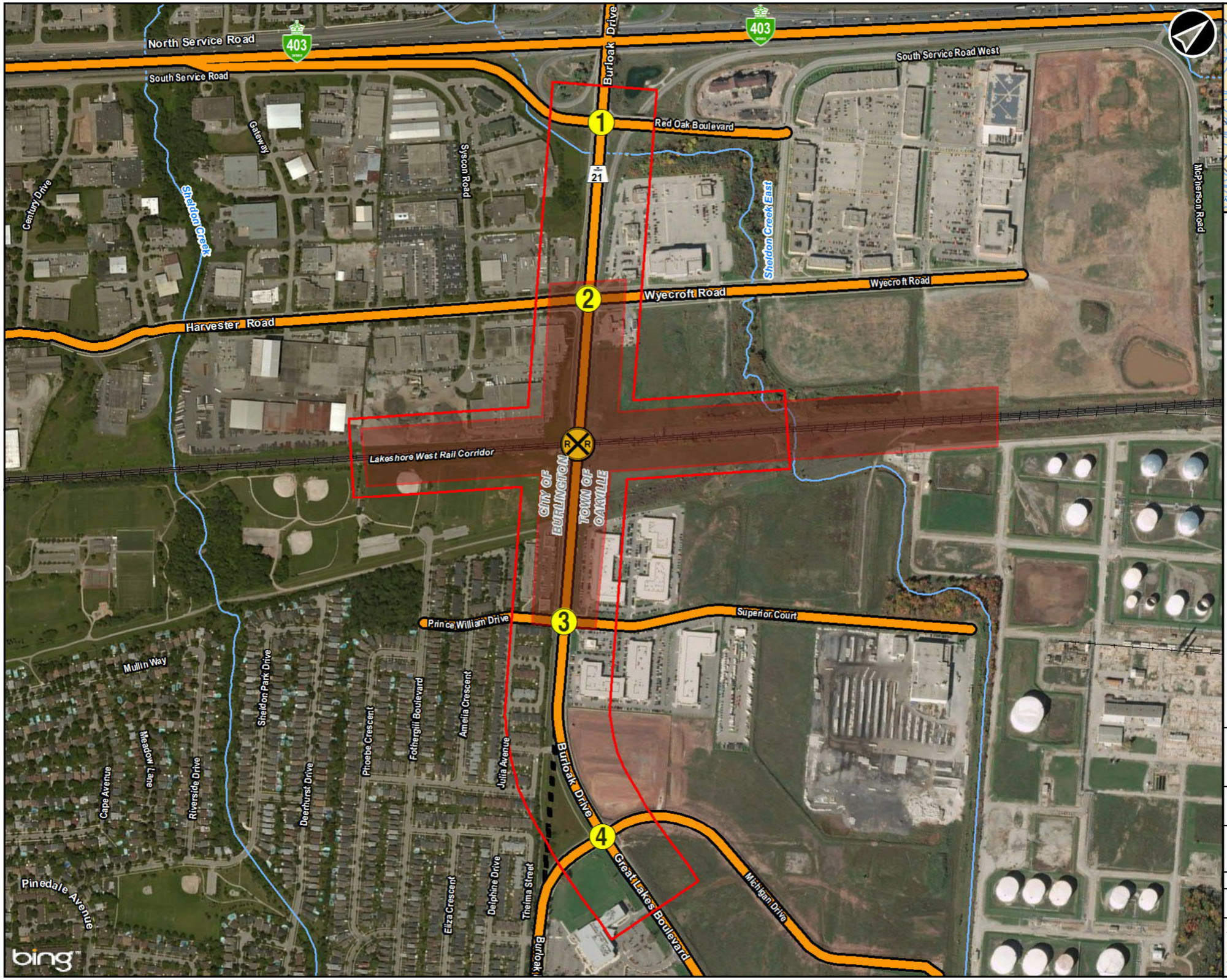
Average Annual Daily Traffic (AADT)

An automatic traffic recorder (ATR) was utilized to count traffic volumes on Burloak Drive, just south of the Lakeshore West Rail Corridor from January 17, 2017 to January 23, 2017 to capture seven (7) days of traffic movement pattern in the Assessment Area. The traffic count incorporated both weekday and weekend traffic counts. From this traffic count data, the AM and PM peak hours were identified and the Average Daily Traffic (ADT) volumes as well as an estimation of the annual average daily traffic (AADT) volume were obtained. The observed AM and PM peak hour traffic volumes and ADT per direction as well as the estimated AADT volume are shown in **Table 3-12**.

Table 3-12: Existing (2017) Traffic Volumes Collected by ATR on Burloak Drive near the Grade Crossing

Time of Day	Weekday Average			Saturday			Sunday		
	Peak Hour	*Northbound*	*Southbound*	*Peak Hour*	*Northbound*	*Southbound*	*Peak Hour*	*Northbound*	*Southbound*
AM Peak (vph)	8:00AM ~ 9:00AM	1,273	958	11:00AM ~ 12:00PM	767	662	11:00AM ~ 12:00PM	899	847
PM Peak (vph)	5:00PM ~ 6:00PM	962	1463	5:00PM ~ 6:00PM	651	110	1:00PM ~ 2:00PM	1,176	779
ADT (vpd)		12,086	12,956		10,178	10,792		8,732	9,600
AADT (vpd)	**23,502**								

Notes: vph =Vehicles per hour; vpd = Vehicles per day.



Legend

- Study Area
- Traffic Assessment Area
- Permanent Watercourse
- Intermittent Watercourse
- Railway
- Municipal Boundary
- Key Road Intersection
- Existing At-Grade Rail Crossing
- Study Area Road Network

0 50 100 200 300 400 500
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Study Area Road Network and Key Intersections

Sep, 2017	1:7,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 3-22**

AECOM

As shown in **Table 3-12**, the weekday AM peak hour occurs from 8:00 AM to 9:00 AM and the weekday PM peak hour occurs from 5:00 PM to 6:00 PM. The AM peak direction is northbound and the peak volume is 1,273 vehicles per hour (vph). The PM peak direction is southbound and the peak volume is 1,463 vph. The bi-directional Annual Average Daily Traffic (AADT) on the studied section of the road is 23,502 vehicles per day (vpd).

Intersection Turning Movements

The turning movement counts were conducted at the four (4) key intersections, as outlined in **Section 3.7.2.1**. The traffic counts were conducted on Thursday, January 19, 2017 from 7:00 AM to 10:00 AM and 4:00 PM to 7:00 PM. The weekday AM peak hour occurred between 7:45 AM and 8:45 AM for all the intersections except for the Burloak Drive and Highway 403/QEW eastbound Off-Ramp intersection. The AM peak hour occurred at this intersection between 7:30 AM and 8:30 AM. The PM peak hour occurred between 4:30 PM and 5:30 PM at all four (4) intersections. Data collection included passenger car, truck, and heavy vehicle volumes. The existing AM and PM peak hour traffic volumes at the key intersections are shown in **Figure 3-23** and **Figure 3-24**, respectively. Additional traffic count details are located in Appendix A of **Appendix B8**.

Figure 3-23: Existing (2017) AM Peak Hour Turning Movement Volumes at the Assessment Area Intersections

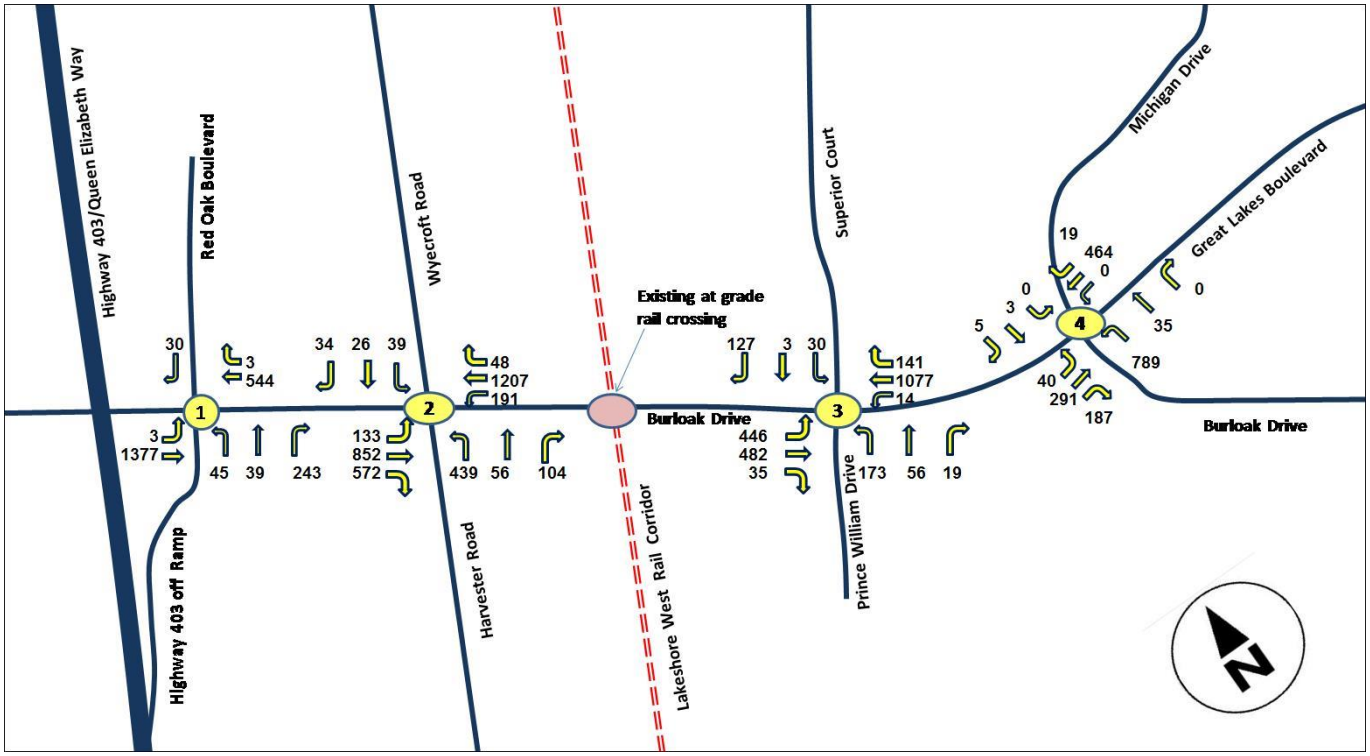
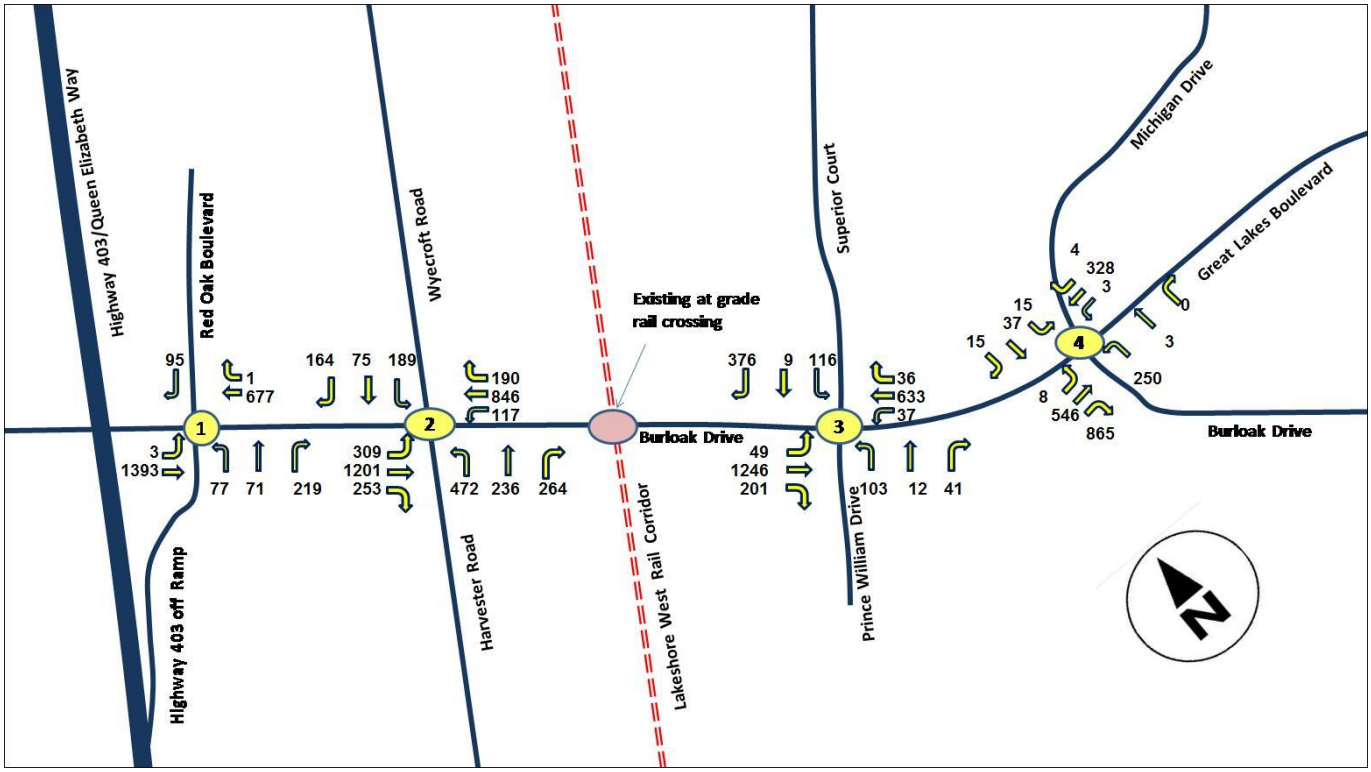


Figure 3-24: Existing (2017) PM Peak Hour Turning Movement Volumes at the Assessment Area Intersection



3.7.2.1.2 Traffic Operations

The capacity and LOS analysis was performed to obtain the existing (2017) traffic conditions. The capacity of an intersection is usually determined by the volume-to-capacity (V/C) ratio. The V/C ratio is defined as the ratio of flow rate to capacity for a transportation facility. The higher the value, the more congestion is experienced by motorists. A V/C ratio less than 0.85 generally indicates that adequate capacity is available and vehicles are not expected to experience significant queues and delays. A V/C ratio between 0.85 and 0.95 generally indicates that the intersection is operating near its capacity. Higher delays may be expected, but continuously increasing queues should not occur. As the V/C ratio approaches 1.0, traffic flow may become unstable, and delays and queuing conditions may occur.

The LOS of each movement is based on the average delay experienced by vehicles and is expressed as seconds per vehicle. Based on the delay, a letter grade is assigned to the individual movement. For signalized intersections, the LOS ranges from 10 seconds or less for LOS “A”, to LOS “F” for delays greater than 80 seconds. For unsignalized intersections, the LOS ranges from 10 seconds or less for LOS “A”, to LOS “F” for delays greater than 50 seconds. When the V/C ratio reaches a value of 1.0, the theoretical capacity of the road element (e.g., movement, approach, overall intersection) has been reached and the LOS would be “F” to represent a failure from a capacity perspective. Generally, LOS “D” is the lowest acceptable LOS for a given turning movement within an intersection when analyzing short-term planning horizons (10 years or less). LOS “F” means the intersection is failing to maintain an acceptable LOS.

The results for each intersection are provided below. In general, the results of the capacity and LOS analysis show that all the key intersections in the Assessment Area currently operate at an acceptable LOS service. The full Synchro outputs are provided in Appendix B of **Appendix B8**.

Burloak Drive and Highway 403/QEW Eastbound Off-Ramp / Red Oak Boulevard

The intersection of Burloak Drive and the Highway 403/QEW eastbound off-ramp is a signalized 4-legged intersection. The west leg of the intersection is the Highway 403/QEW eastbound off-ramp and only one-way (eastbound) movement is allowed on this approach. The westbound approach to the intersection operates as right turn only; from Red Oak Boulevard to northbound Burloak Drive. The Synchro analysis shows that the eastbound and northbound approaches currently operate at an LOS "B" during the AM and PM peak hours. The right-turn-only movement at the westbound approach operates at an excellent LOS "A" both in the AM and PM peak hours. The southbound approach currently operates at LOS "B" in the AM peak hour and LOS "C" in the PM peak hour. The V/C ratio for all the movements is less than 0.85, which indicates that significant delays or queues are not expected. This information is provided below in **Table 3-13**.

Table 3-13: Summary of Existing (2017) Traffic Operations at the Intersection of Burloak Drive and Highway 403/QEW Eastbound Off-Ramp / Red Oak Boulevard

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	45	39	243			30	3*	1377			544	3
	V/C Ratio	0.10	0.20	0.28			0.06		0.61			0.32	0.0
	Delay (sec)	31.2	10.2	7.4			0.06		19.4			15.8	0.0
	Q length 95th % (m)	17.2	12.4	15.7			0.0		97.9			50.8	0.0
	Movement LOS	C	B	A			A		B			B	A
	Approach LOS	B			A			B			B		
	Intersection LOS	B											
PM	Volume (vph)	77	71	219			95	3*	1399			677	1
	V/C Ratio	0.19	0.23	0.27			0.24		0.65			0.43	0.0
	Delay (sec)	33.1	13.9	7.6			1.4		22.5			18.9	0.0
	Q length 95th % (m)	26.5	16.2	15.1			0.0		99.6			65.0	0.0
	Movement LOS	C	B	A			A		C			B	A
	Approach LOS	B			A			C			B		
	Intersection LOS	C											

*Notes: * indicates left turn is not allowed. Traffic counts recorded few illegal turnings. LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.*

Burloak Drive and Harvester Road / Wyecroft Road

The intersection of Burloak Drive and Harvester Road / Wyecroft Road is a signalized 4-legged intersection. The southbound and northbound approaches have three (3) through-lanes and one (1) dedicated right and one (1) dedicated left-turn lane. The eastbound and westbound approaches have two (2) through-lanes and one (1) dedicated right and one (1) dedicated left-turn lane. There is painted channelization for left turning movement at each approach. There is also channelization for the eastbound and southbound right turning movements. Overall the intersection operates at a LOS "C" during the AM peak hour and LOS "D" during the PM peak hour. Several movements at this intersection currently operate at a LOS "D". The V/C ratio for the eastbound left turn movement is 0.91 during the AM peak hour and 0.82 in the PM peak hour, indicating that some delays or queues would be expecting in the morning. The eastbound-left movement in the AM and PM peak hours and the southbound-left movement during the PM peak hour experience moderate amount of delay and the 95th percentile traffic volume may not be served in one (1) cycle. Overall, the intersection is currently operating at an acceptable LOS. This information is provided below in **Table 3-14**.

Table 3-14: Summary of Existing (2017) Traffic Operations at the Intersection of Burloak Drive and Harvester Road / Wyecroft Road

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	439	56	104	39	26	34	133	852	572	191	1207	48
	V/C Ratio	0.91	0.06	0.22	0.14	0.09	0.13	0.55	0.51	0.64	0.54	0.68	0.08
	Delay (sec)	53.1	33.5	7.9	26.2	45.8	1.0	19.8	25.7	5.2	16.0	27.5	0.2
	Q length 95th % (m)	#143.6	11.8	13.9	14.5	7.6	0.0	23.0	63.1	20.4	29.2	93.9	0.0
	Movement LOS	D	C	A	C	D	A	B	C	A	B	C	A
	Approach LOS	D			C			B			C		
	Intersection LOS	C											
PM	Volume (vph)	472	236	264	189	75	164	309	1201	253	117	846	190
	V/C Ratio	0.82	0.30	0.53	0.65	0.28	0.61	0.84	0.68	0.36	0.56	0.61	0.34
	Delay (sec)	43.3	38.4	16.7	37.1	54.9	17.1	39.3	32.2	4.2	26.5	36.6	5.7
	Q length 95th % (m)	#140.4	40.1	44.7	52.6	18.3	21.3	#94.5	112.4	16.4	26.3	84.6	16.8
	Movement LOS	D	D	B	D	D	B	D	C	A	C	D	A
	Approach LOS	C			C			C			C		
	Intersection LOS	D											

Notes: # indicates volume of 95th percentile traffic volume may not be served in one cycle; m indicates volume for 95th percentile queue is metered by upstream signal. LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.

Burloak Drive and Prince William Drive / Superior Court

The intersection of Burloak Drive and Prince William Drive / Superior Court is a signalized 4-legged intersection. The southbound and northbound approaches of the intersection have one (1) through-lane and one (1) shared through and right-turn lane and a dedicated left-turn lane. The eastbound and westbound approaches have one (1) shared through and right-turn lane and one (1) dedicated left-turn lane. Overall the intersection operates at a LOS "D" during the AM peak hour and LOS "C" during PM peak hour. The southbound left turn movement operates at LOS "E" in the AM peak hour due to high left turning (446 vph) and high opposing through traffic volumes. The V/C ratio for this southbound left-turn movement is 0.97. The northbound through movement operates at a LOS "D" and the V/C ratio is 1.00. The analysis shows that a long queue (longer than 175 m) may be expected at the northbound approach during the AM peak hour. The intersection may experience congestion in the AM peak hour. The intersection operates at an acceptable LOS service during the PM peak hour. This information is provided below in **Table 3-15**.

Table 3-15: Summary of Existing (2017) Traffic Operations at the Intersection of Burloak Drive and Prince William Drive / Superior Court

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	173	56	19	30	3	127	446	482	35	14	1077	141
	V/C Ratio	0.53	0.16		0.09	0.26		0.97	0.24		0.05	1.00	
	Delay (sec)	39.9	24.8		30.0	6.7		65.9	10.4		17.0	53.0	
	Q length 95th % (m)	56.8	22.3		12.8	14.7		#141.1	33.4		m2.8	#177.7	
	Movement LOS	D	C		C	A		E	B		B	D	
	Approach LOS	D			B			D			D		
	Intersection LOS	D											
PM	Volume (vph)	103	12	41	116	9	376	49	1246	201	37	633	36
	V/C Ratio	0.64	0.11		0.30	0.62		0.14	0.83		0.46	0.43	
	Delay (sec)	46.8	11.2		26.2	15.0		9.5	21.1		38.7	16.6	
	Q length 95th % (m)	#42.2	10.4		31.5	54.3		8.5	134.8		#19.4	58.4	
	Movement LOS	D	B		C	B		A	C		D	B	
	Approach LOS	C			B			C			B		
	Intersection LOS	C											

Notes: LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; V/C – Volume/Capacity ratio; Q – Queue; LOS – Level of Service;

Note that in assessing the traffic operations in the existing conditions, the Synchro default peak hour factor (PHF) of 0.92 was used for all the individual movements at the study intersections. The only exceptions are the northbound through and southbound left-turn movements at the intersection of Burloak Drive and Prince William Drive / Superior Court where the default PHF value resulted in unexpected V/C ratios of greater than 1.00 for the two (2) noted movements in the AM peak hour. It was unexpected because when actual turning movement counts (i.e., departure volumes in 2017) are used in the analysis, the actual V/C ratios cannot be greater than 1.00, otherwise that volume of traffic would not be able to depart the intersection. As per the Highway Capacity Manual (HCM), if V/C ratios greater than 1.00 persist when counts of actual departure volumes are used in the analysis, it is an indication that the intersection operates more efficiently than anticipated by the computational techniques using various default values. Hence, for the two (2) noted individual movements, a PHF of 1.00 was used in the AM peak hour Synchro model.

Burloak Drive and Michigan Drive / Great Lakes Boulevard

The intersection of Burloak Drive and Michigan Drive / Great Lakes Boulevard is a signalized 4-legged intersection. The westbound approach created by Michigan Drive has very low traffic volume as the road terminates at a cul-de-sac. The westbound approach has one (1) dedicated left-turn lane and one (1) shared through and right-turn lane. The southbound approach of the intersection has one (1) through-lane and one (1) dedicated right-turn lane and one (1) dedicated left-turn lane. The northbound approach has one (1) through-lane and one (1) shared through and right-turn lane and one (1) dedicated left-turn lane. The eastbound approach has two (2) dedicated left-turn lanes and one (1) shared through and right-turn lane. There are 789 left-turning vehicles at the eastbound approach during the AM peak hour. There is also high right turning traffic volume (865 vph) at the southbound approach during the PM peak hour. The northbound and southbound through traffic volumes are relatively lower than the above turning volumes during both the AM and PM peak hours. Overall the intersection operates well at a LOS “C” during both the AM and PM peak hours. The V/C ratios for all the movements are below the critical limit of 0.85. This information is provided below in **Table 3-16**.

Table 3-16: Summary of Existing (2017) Traffic Operations at the Intersection of Burloak Drive and Michigan Drive / Great Lakes Boulevard

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	789	35	0	0	3	5	40	291	187	0	464	19
	V/C Ratio	0.81	0.07		0.00	0.06		0.09	0.30	0.20	0.0	0.26	
	Delay (sec)	41.9	23.7		0.0	35.1		10.9	11.2	1.1	0.0	14.0	
	Q length 95th % (m)	100.4	10.2		0.0	5.6		6.4	30.1	3.0	0.0	53.2	
	Movement LOS	D	C		A	D		B	B	A	A	B	
	Approach LOS	D			D			A			B		
	Intersection LOS	C											
PM	Volume (vph)	250	3	0	15	37	15	8	546	865	3	328	4
	V/C Ratio	0.56	0.01		0.12	0.30		0.01	0.52	0.70	0.01	0.17	
	Delay (sec)	40.6	22.3		38.7	33.4		9.4	13.5	4.4	9.3	8.9	
	Q length 95th % (m)	33.7	2.3		8.4	17.3		2.9	98.2	18.8	1.5	23.5	
	Movement LOS	D	C		D	C		A	B	A	A	A	
	Approach LOS	D			C			A			A		
	Intersection LOS	C											

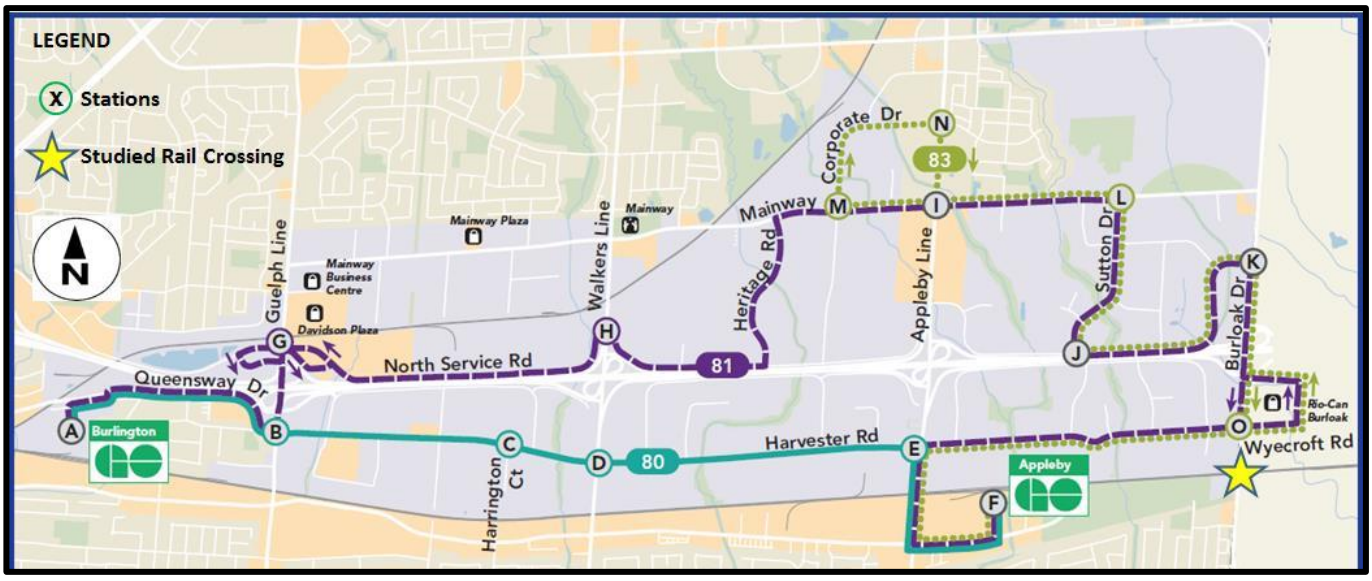
Notes: LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour.

3.7.2.2 Transit Network

3.7.2.2.1 City of Burlington

Burlington Transit currently operates two (2) bus routes on Burloak Drive which pass through the Assessment Area: Route #81 – Harvester East and West Service and Route # 83 – Harvester North Service. Route #81 – Harvester East and West Service provides service between Appleby GO Station and Burlington GO Station via Harvester Road, Wyecroft Road, Burloak Drive, Sutton Drive, Mainway, Heritage Road, and North Service Road. Route #83 – Harvester North Service begins at Appleby GO Station and provides service along Harvester Road, Wyecroft Road, Burloak Drive, Sutton Drive, Mainway, and loops around Corporate Drive and returns back to Appleby GO Station following the same route. **Figure 3-25** illustrates Burlington Transit Routes #81 and #83.

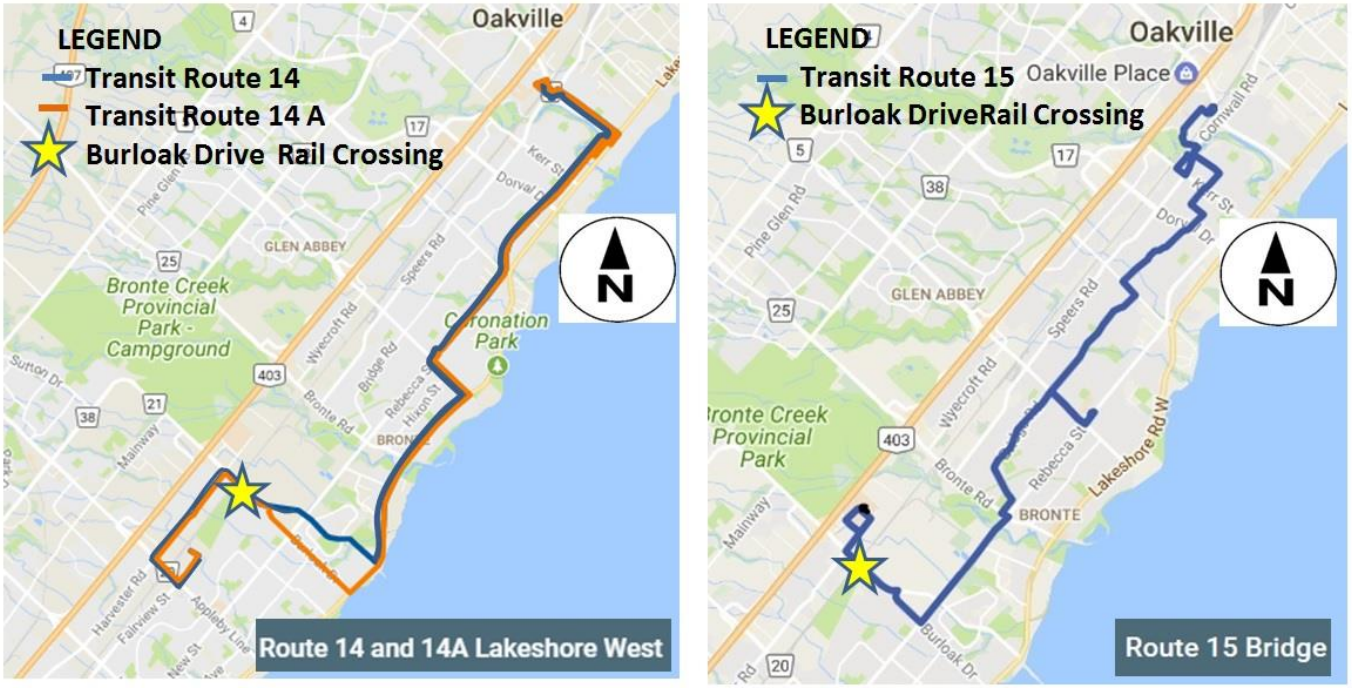
Figure 3-25: Burlington Transit Routes #81 and #83 in the Assessment Area



3.7.2.2.2 Town of Oakville

Oakville Transit currently operates two bus routes on Burloak Drive which pass through the Assessment Area: Route #14 – Lakeshore West and Route #15 – Bridge. Route #14 – Lakeshore West provides service from Oakville GO Station to Appleby GO Station along Reynold Street, Rebecca Street, Third Line, Lakeshore Road West, Great Lakes Boulevard, Burloak Drive, and Harvester Road. Route #14 has a variation in its route called #14A, which uses Burloak Drive rather than Great Lakes Boulevard. Route #15 - Bridge provides service from Oakville GO Station to the RioCan Centre along several key roads including Queen Mary Drive, Stewart Street, Mary Street, Wildwood Drive, Bridge Road, Rebecca Street, and Burloak Drive.. **Figure 3-26** illustrates Oakville Transit Routes #14 and #15.

Figure 3-26: Oakville Transit Routes #14 and #15 in the Assessment Area



3.7.2.3 Cycling, Pedestrian and Trail Network

The transportation modes of walking and cycling have direct links with other modes of transportation since many transit trips start and end with a walk or cycling trip to/from transit stops or parking areas. The existing active transportation network within the Assessment Area is provided in **Figure 3-27**.

3.7.2.3.1 Halton Region

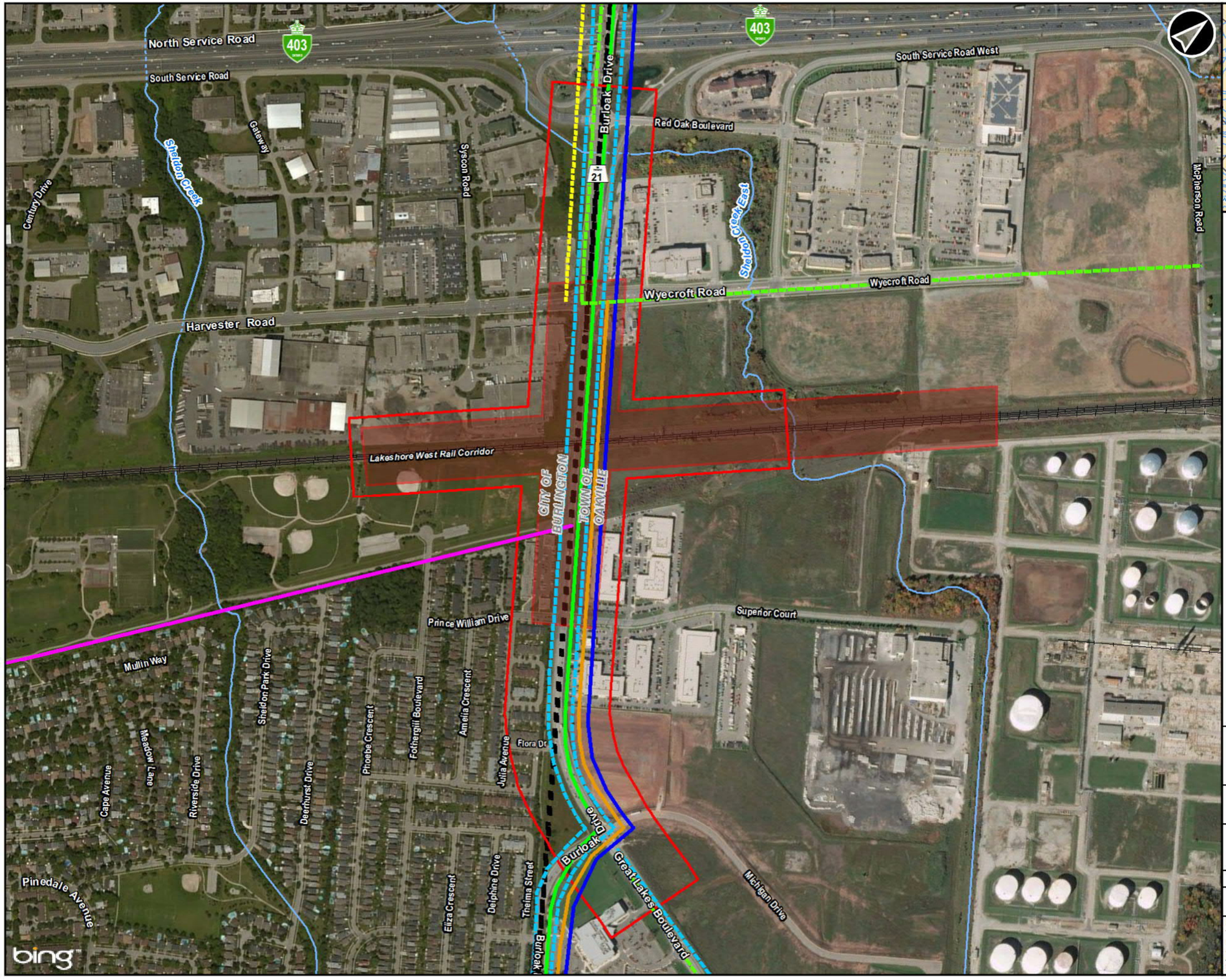
The Halton Region Active Transportation Master Plan (May 2015) designates the cycling and sidewalk facilities on Burloak Drive as existing Regional infrastructure. In addition, the Regional Master Plan identifies existing and planned bike routes of Regional significance on Wyecroft Road and Burloak Drive south of Wyecroft Road, though not on Regional roads. The Regional Master Plan also identifies a Regionally significant pedestrian facility on Wyecroft Road.

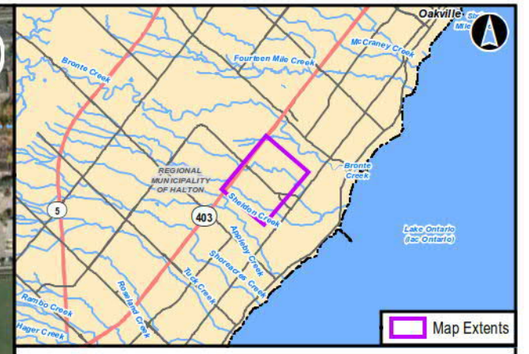
3.7.2.3.2 City of Burlington

There is a sidewalk along the west side of Burloak Drive from the Highway 403/QEW eastbound off-ramp / Red Oak Boulevard to Michigan Drive / Great Oaks Boulevard. The sidewalk splits at Flora Drive, as shown in **Figure 3-27**.

The City of Burlington Cycling Master Plan (July 2009) identifies the following existing bike lanes and trails: “Existing Bike Lane” on Burloak Drive, “Existing Multi-Use Path” north of Prince William Drive on the south side of Sherwood Forest Park and “Existing Multi-Use Path” in Sherwood Forest Park.

In addition, the Master Plan identifies a “Proposed Bike Lane” on Harvester Road and a “Proposed Multi-use Path” on Burloak Drive in the short-term (2009 to 2015). The Master Plan also identifies the existing multi-use path at Sherwood Forest Park and Burloak Drive for “Intersection Improvement” in the short term (2009 to 2015).





Legend

- Study Area
- Traffic Assessment Area
- Permanent Watercourse
- Intermittent Watercourse
- Railway
- Municipal Boundary
- Existing Bike Lane
- Existing Multi-Use Path
- Existing Multi-use Trail (Off Road – In Boulevard)
- Regional Cycling Network
- Proposed Bike Lane (On-Road)
- Proposed Sidewalk Connection
- Proposed Regional Sidewalk Connection

0 50 100 200 300 400 500
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Active Transportation Network in the Study Area

Sep, 2017	1:7,000 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	
AECOM		**Figure 3-27**

3.7.2.3.3 Town of Oakville

The Town of Oakville Active Transportation Master Plan (September 2009) identifies an "Existing Multi-use Trail (Off-Road – In Boulevard)" on Burloak Drive south of Wyecroft Road. In addition, the Master Plan identifies a "Proposed Bike Lane (On-Road)" on Wyecroft Road and on Burloak Drive north of Wyecroft Road for medium-term implementation (6 to 10 years). Both of these routes are identified as a "Prime (Spine) Route" within the transportation route network hierarchy. There are currently directional on-road cycle lanes on both sides of Burloak Drive between Harvester Road / Wyecroft Road and Great Oaks Boulevard / Michigan Drive.

In addition to the above-noted cycling facilities, the Oakville Master Plan identifies a "Proposed Sidewalk Connection (Sidewalk on both sides of the street)" on Wyecroft Road and a "Proposed Sidewalk Connection (Sidewalk on one (1) side of the street)" on Burloak Drive, both to be implemented mid-term (6 to 10 years). The Master Plan also identifies a "Proposed Regional Sidewalk Connection" north of Wyecroft Road in the short-term (0 to 5 years). Sidewalks have been implemented on both sides of Wyecroft Road, the south side of Superior Court, and the north side of Michigan Drive.

The Oakville Master Plan also identifies the Lakeshore West Rail Corridor at Burloak Drive as a "Constraint/Barrier" for pedestrian and cyclist movement.

3.7.2.3.4 Cyclist and Pedestrian Counts

A 12-hour (7:00 AM-7:00 PM) pedestrian and cyclist count was conducted on Burloak Drive just south of the rail corridor on January 19, 2017. Due to the wintery weather conditions, it was decided to conduct the pedestrian and cyclist count again when the weather was more favourable for cycling and walking. The counts were conducted at 15-minute intervals between 7:00 AM and 7:00 PM on one weekday (Thursday, June 22, 2017) and one weekend day (Saturday, June 24, 2017). The results of the 12-hour count are summarized in **Table 3-17**; analyses are provided in **Appendix B8**.

Table 3-17: Summary of 12-hr Cyclist and Pedestrian Counts on Burloak Drive just South of Rail Corridor

Date of Counts	Day	Bicycles			Pedestrians					
		NB	SB	Total	East Approach		Total	West Approach		Total
					NB	*SB*		*NB*	*SB*	
January 19, 2017	Weekday	14	8	22	0	1	1	19	19	38
June 22, 2017	Weekday	18	19	37	0	1	1	9	16	25
June 24, 2017	Weekend	28	37	65	0	0	0	4	8	12

4. Effects Assessment, Mitigation and Monitoring of the Preferred Design

4.1 Effects Assessment Methodology

O. Reg. 231/08 (Transit Projects Regulation) requires the proponent to prepare an EPR that contains the following information:

- An assessment and evaluation of the potential effects that the Project may have on the environment;
- A description of any measures proposed to mitigate any negative effects that the Project may have on the environment; and
- A description of the means to monitor or verify the effectiveness of the proposed mitigations to reduce or eliminate adverse effects.

The purpose of this section is to document these requirements for the Burloak Drive Grade Separation Project. The potential effects of the Project have been assessed in terms of potential changes to natural, socio-economic, and cultural environments, based on the analysis and results of the following discipline-specific environmental studies:

- Natural Environment Report (**Appendix B1**);
- Tree Inventory Plan (**Appendix B2**);
- Geology and Groundwater;
- Air Quality Assessment Report (**Appendix B3**);
- Noise and Vibration Impact Assessment Report (**Appendix B4**);
- Socio-Economic and Land Use Characteristics Report (**Appendix B5**);
- Cultural Heritage Screening Report (**Appendix B6**);
- Stage 1 Archaeological Assessment Report (**Appendix B7**); and
- Traffic Impact Assessment (**Appendix B8**).

4.2 Natural Environment

The following sections identify terrestrial and aquatic features that may be potentially affected by the proposed construction and operation of the Project. Mitigation and compensation measures and environmental monitoring recommendations are provided below.

4.2.1 Designated Features

Provincially or Locally Significant Wetlands, ANSIs or ESAs were not identified within the Study Area and therefore no further assessments of these natural heritage features are required. However, two (2) natural heritage features identified on municipal and regional official plan mapping fall within the Study Area. These features are Sherwood Forest Park and a wooded portion of Sheldon Creek. Additionally, a Regulated Area under the jurisdiction of Conservation Halton falls within the Study Area, and is associated with the east branch of Sheldon Creek.

4.2.1.1 Potential Effects

4.2.1.1.1 Construction

Portions of the City of Burlington, Town of Oakville and Halton Region natural heritage systems lie within the proposed construction disturbance area, which constitute the area assessed for potential effects resulting from the Project. The proposed construction disturbance area is illustrated in **Figure 4-1A** and **4-1B**.

Sherwood Forest Park

The proposed construction disturbance area encroaches upon a small portion of Sherwood Forest Park. Removal of approximately 0.0056 ha of vegetation along the fence separating the park from the rail corridor may be required during the construction phase, but disturbance to the recreational fields is not anticipated. Any individual trees within and outside of the Metrolinx ROW affected by construction are discussed in the Tree Inventory Plan (**Appendix B2**), which identifies trees to be preserved, removed, or injured and the associated permitting requirements. The report identifies 24 trees within the park that may be affected by construction activities.

Sheldon Creek

The wooded portion of Sheldon Creek is designated as part of the Halton Region and Town of Oakville natural heritage systems and lies within the Study Area; however, minimal effects on this feature are anticipated, based on the initial vegetation removal during construction.

Conservation Halton Regulated Area

Approximately 0.14 ha of land, which will be affected by the construction along the rail corridor, falls within a Regulated Area under the jurisdiction of Conservation Halton. It is anticipated that potential effects on the Regulated Area will include initial vegetation removal, erosion, and the risk of spills from equipment use; see Sections 4.2 and 4.4 of **Appendix B1** for a description of these effects.

4.2.1.1.2 Operations

Sherwood Forest Park

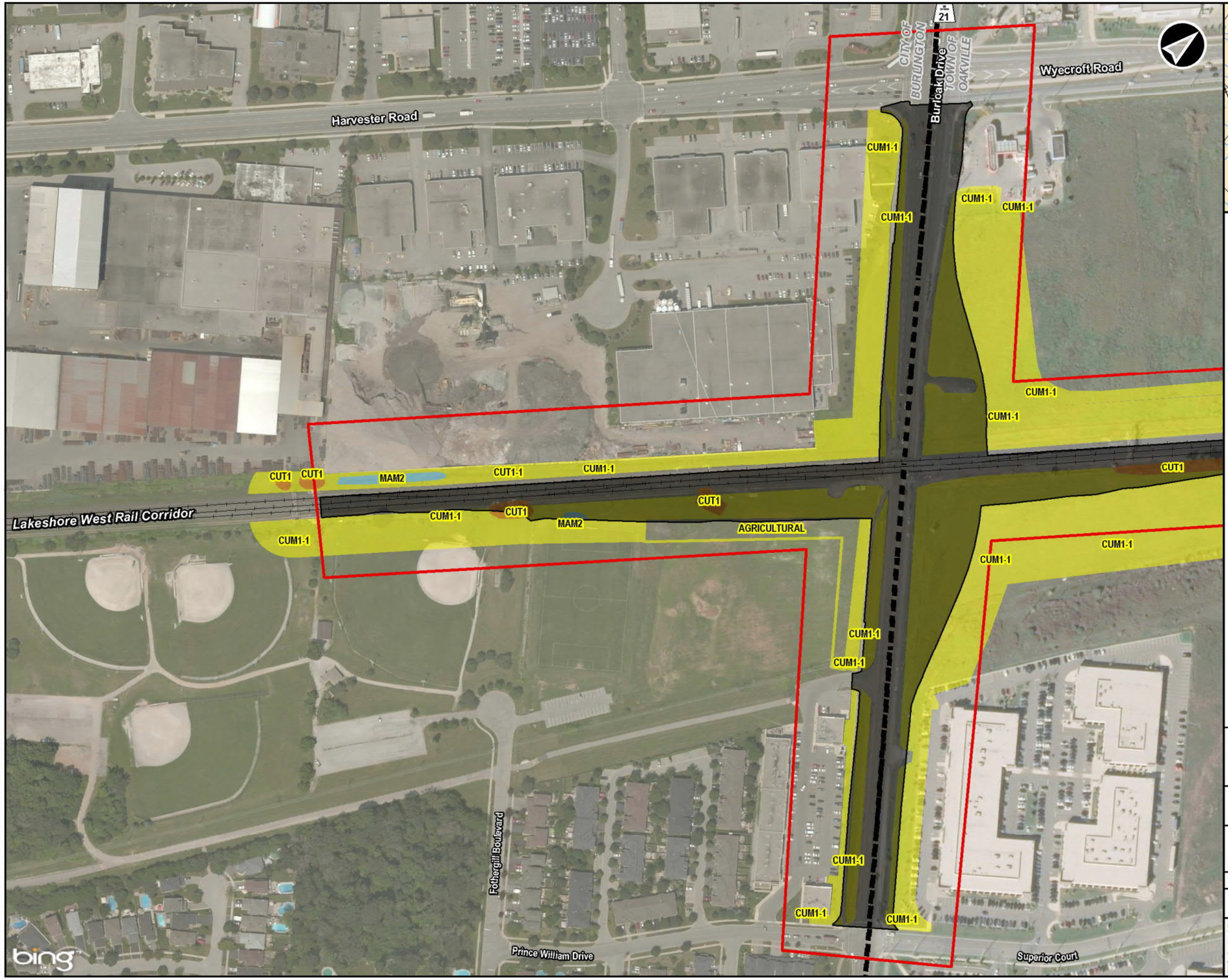
It is anticipated that potential effects on Sherwood Forest Park will be limited to the initial vegetation removal during the construction phase. As a result, minimal potential effects are anticipated on this feature during operation of the Project.

Sheldon Creek

It is anticipated that potential effects on the wooded portion of Sheldon Creek will be limited to the initial vegetation removal during the construction phase. As a result, minimal potential effects are anticipated on this feature during operation of the Project.

Conservation Halton Regulated Area

It is anticipated that potential effects within the Conservation Halton regulated area will be limited to the initial vegetation removal during the construction phase. As a result, minimal potential effects are anticipated on this area during operation of the Project.



Legend

- Study Area
- Construction Disturbance Area - 10% Detail Design
- Municipal Boundary
- Permanent Watercourse
- Intermittent Watercourse
- Railway

Environmental Land Classification

- Agricultural
- CUM - Cultural Meadow
- CUT - Cultural Thicket
- CUW - Cultural Woodland
- FOD - Deciduous Forest
- MAM - Meadow Marsh
- MAS - Shallow Marsh

ELC Code	Vegetation Type
CUM1	Mineral Cultural Meadow Ecosite
CUM1-1	Dry - Moist Old Field Meadow Type
CUT1	Mineral Cultural Thicket Ecosite
CUT1-1	Sumac Cultural Thicket Type
CUW	Cultural Woodland
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite
MAM2	Mineral Meadow Marsh Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type

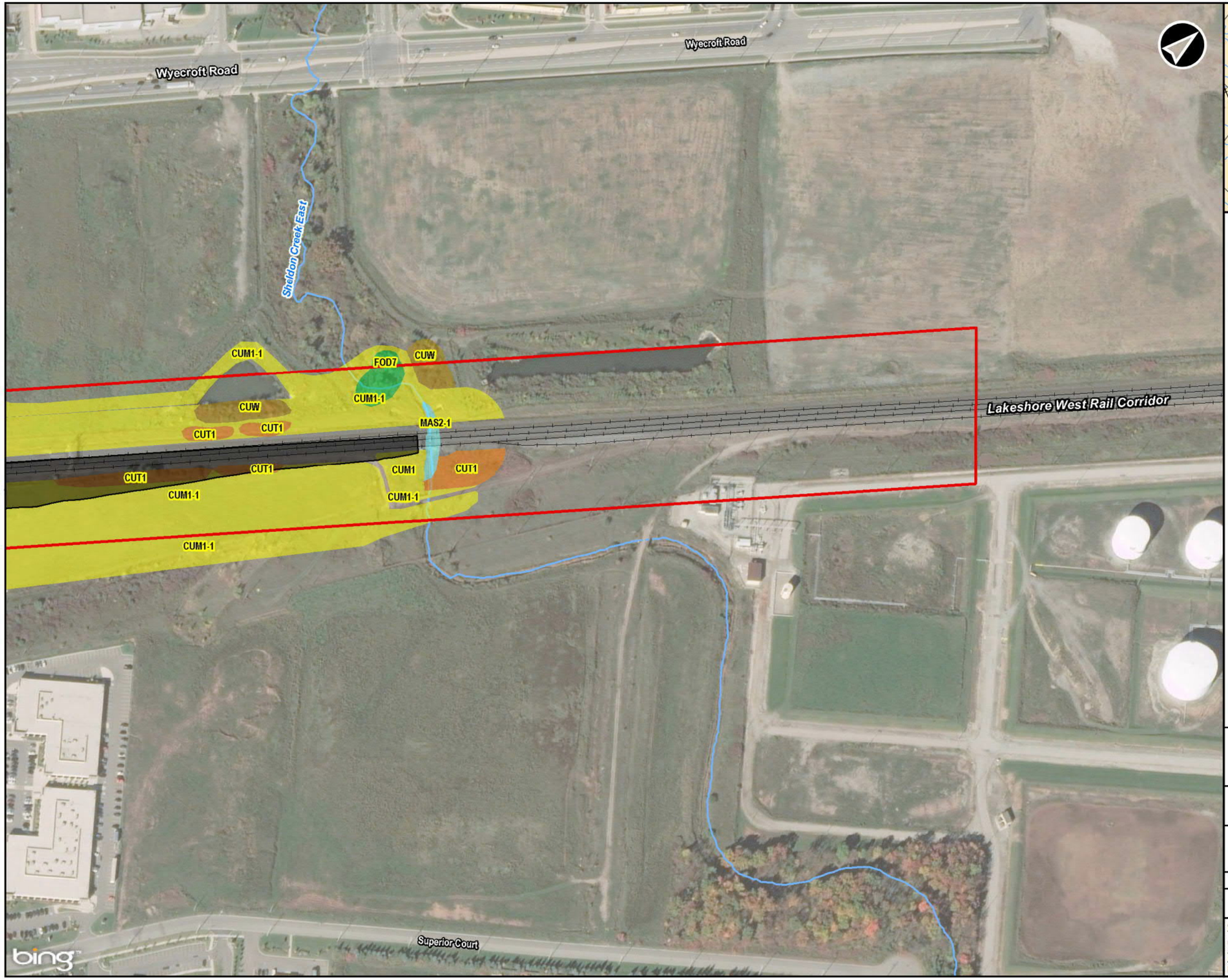
0 25 50 100 150
Metres

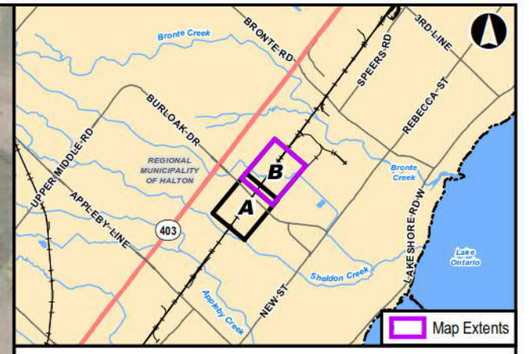
Burloak Drive Grade Separation TPAP
Environmental Project Report

Impact Areas for Vegetation Communities

Oct, 2017	1:2,600 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 4-1A**

AECOM





Legend

- Study Area
- Construction Disturbance Area - 10% Detail Design
- Municipal Boundary
- Permanent Watercourse
- Intermittent Watercourse
- Railway

Environmental Land Classification

- Agricultural
- CUM - Cultural Meadow
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CUT1-1	Sumac Cultural Thicket Type
CUW	Cultural Woodland
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite
MAM2	Mineral Meadow Marsh Ecosite
MAS2-1	Cattail Mineral Shallow Marsh Type

0 25 50 100 150
Metres

Burloak Drive Grade Separation TPAP
Environmental Project Report

Impact Areas for Vegetation Communities

Oct, 2017	1:2,600 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: AECOM, OMNRF, MMAH
P#:60512842	V:01	**Figure 4-1B**

AECOM

4.2.1.2 Mitigation and Monitoring

4.2.1.2.1 Construction

The following general mitigation measures shall be implemented where designated natural heritage features may be affected during the construction phase:

- Vegetation removal shall be kept to a minimum, limited to within the construction disturbance area and scheduled to occur outside of the overall bird nesting season of April 1st to August 31st, following the mitigation measures described in **Section 4.2.3.2**.
- Areas for vegetation removal shall be refined during detailed design, if required (e.g., change in construction disturbance area, final staging areas).
- Stockpiled materials or equipment shall be stored within the Study Area, but shall avoid Sherwood Forest Park and be kept at least 30 m away from the east branch of Sheldon Creek.
- Construction fencing and/or silt fencing, where appropriate, shall be installed and maintained to clearly define the construction disturbance area and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. Fencing shall be monitored and repaired as necessary throughout the construction period and shall be removed and disposed of accordingly, post-construction.
- Any damaged trees shall be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an Arborist.
- Exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.
- Wherever possible, Metrolinx shall engage Conservation Authorities on specific projects (or components thereof) and shall adhere to requirements where possible and feasible on aspects such as tree protection/removal, sewer discharge and requirements for working within Regulated Areas.
- Additional mitigation measures regarding vegetation removal, and relevant to designated features, are described below in **Section 4.2.2.2**.

Prior to construction, a Stormwater Management Report shall be completed during detailed design to determine impacts and mitigation measures associated with Sheldon Creek and the associated floodplain. Consultation with Conservation Halton is required prior to commencing the report to confirm requirements. Prior to report finalization, Conservation Halton will review and approve the report.

4.2.1.2.2 Operations

No mitigation measures are recommended during operations, as potential effects on designated natural heritage features are not anticipated as a result of operation of the Project.

4.2.2 Naturalized Areas and Vegetation Communities

Although the majority of the Study Area is comprised of residential, commercial and industrial development, there are approximately 5.2 ha occupied by natural or cultural vegetation communities. Generally, the natural vegetation communities surveyed by AECOM had high concentrations of invasive species indicating that habitat conditions were highly disturbed and were of poor quality.

4.2.2.1 Potential Effects

4.2.2.1.1 Construction

Given the highly-developed landscape, the Study Area is largely comprised of vegetation that tolerates frequent disturbance and is quick to recolonize; as a result, potential effects of the Project on these vegetation communities are not anticipated as significant. **Table 4-1** provides a breakdown of existing natural vegetation communities and their current areas within the Study Area, as well as the proposed area of removal. These areas of removal are also illustrated in **Figure 4-1**.

Table 4-1: Vegetation Communities Affected by Vegetation Removal

ELC Code	ELC Community	Size (ha) of Community within Natural Environment Study Area	Area (ha) Removed
CUM1	Mineral Cultural Meadow	4.91	1.97
CUT1	Mineral Cultural Thicket	0.28	0.22
MAM2	Mineral Meadow Marsh	0.05	0.02
		Total	**2.21**

4.2.2.1.2 Operations

During operation of GO Transit service, it is anticipated that there will be no potential effects on vegetation cover or natural areas beyond the initial removal at the construction phase.

4.2.2.2 Mitigation and Monitoring

4.2.2.2.1 Construction

The following mitigation measures shall apply where vegetation removal may be required during the construction phase:

- Vegetation removal shall be kept to a minimum and limited to within the construction disturbance area and shall be scheduled to occur outside of the overall bird nesting season of April 1st to August 31st, following the mitigation measures described in **Section 4.2.3.2**.
- Areas for vegetation removal shall be refined during detailed design, if required (e.g., change in construction disturbance area, final staging areas).
- Stockpiled materials or equipment shall be stored within the construction disturbance area, but shall avoid Sherwood Forest Park and be kept at least 30 m away from the east branch of Sheldon Creek. Construction fencing and/or silt fencing, where appropriate, shall be installed and maintained to clearly define the construction disturbance area and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. Fencing shall be monitored and repaired as necessary throughout the construction period and shall be removed and disposed of accordingly, post-construction.
- Any damaged trees shall be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an Arborist.
- Exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion.
- On-site inspection shall be undertaken as required during construction to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities.

- Mitigation measures specific to trees shall be adhered-to, including municipal by-law permitting requirements where applicable, that are summarized in the *Burloak Drive Grade Separation Transit Project Assessment Process (TPAP) Tree Inventory Plan* (AECOM, 2017) provided in **Appendix B2**, and which shall be further detailed in an Arborist Report, to be completed during detailed design.
- An Arborist Report shall be completed during detailed design that shall contain at a minimum the following information in addition to details of tree location, size, species, conditions and category:
  - Recommendations for tree/vegetation protection and preservation measures for all trees / vegetation that are to be retained;
  - Details of tree pruning;
  - Details of all trees/vegetation recommended for removal, including removal measures;
  - Mitigation and monitoring measures to ensure success of preservation and removal measures;
  - Should vegetation compensation be required, it shall be in accordance with the Metrolinx Vegetation Compensation Protocol; and
  - Mapping.
- Metrolinx is establishing a Vegetation Compensation Protocol for GO Expansion Program projects and vegetation that is removed shall be compensated for in accordance with the provisions of this protocol:
  - **For Municipal/Private Trees:** Metrolinx shall work with each municipality to develop a municipality-wide streamlined tree permitting /compensation approach for municipal and private trees. The goal is to reduce administrative permitting burden for trees along long stretches of rail corridor.
  - **For Trees within Metrolinx Property:** Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan.
  - **Conservation Authorities:** For vegetation removals within Conservation Authority lands where required, applicable removal and restoration requirements shall be followed.
  - **Federal lands:** For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements shall be followed.
  - **Tree End Use:** Metrolinx shall develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options).

4.2.2.2.2 Operations

No mitigation measures are recommended, as potential effects on vegetation cover or natural areas are not anticipated as a result of operation of the Project.

4.2.3 Wildlife and Wildlife Habitat

The Study Area is located within heavily urbanized portions of Burlington and Oakville, consisting of residential, commercial and industrial areas where natural vegetation is limited to city parks, open spaces, residents' front and backyards and within the Burloak Drive and Lakeshore West Rail Corridor ROWs. All of these vegetated areas, excluding mown lawn, have the potential to provide breeding and nesting habitat for some species of wildlife.

4.2.3.1 Potential Effects

4.2.3.1.1 Construction

Herpetofauna

Amphibian breeding habitat was not identified within the Study Area and as such, no potential effects to herpetofauna are anticipated as a result of construction of the Project.

Migratory Breeding Birds

Most bird species breeding within the Study Area are likely to be common and tolerant to disturbances associated with urban settings. Regardless, many of the recorded bird species are protected under the *MBCA* while others receive protection under the *Fish and Wildlife Act*. As such, any harm or destruction to the migratory birds listed under the *MBCA*, their eggs and/or their active nests is prohibited. Vegetation removal during the regional overall nest period (April 1st to August 31st) can cause displacement of breeding migratory birds and/or destruction of their active nests, which is prohibited under the *MBCA*. This overall nesting period covers most federally-protected migratory bird species that may occur in the Study Area but varies with species and habitat type (Environment and Climate Change Canada (ECCC), 2014).

Mammals

Bat maternity roosting habitat was not identified within the Study Area and as such, no potential effects to bat SAR are anticipated as a result of construction of the Project. No other mammal SAR were identified in the Study Area. Other mammal species that are common and widespread in urban areas (such as raccoons) are not anticipated to be affected by construction of the Project, as these species are highly tolerant and adapted to disturbances associated with urban settings.

Significant Wildlife Habitat

Existing cultural communities potentially affected by the Project are largely disturbed in nature and contain a high proportion of non-native and invasive species. Furthermore, the small sizes of the naturalized communities, their proximity to developed areas, and lack of connectivity to other significant natural features means that these communities provide limited suitable habitat for a limited number of wildlife species, i.e., common and abundant species that occupy a variety of habitats and have a high tolerance to human activity. As there were no SWHs that met the descriptions and criteria described in the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015c) identified within the Study Area (refer to **Section 3.1.2.3.4**), no potential effects to SWH are anticipated as result of construction of the Project.

4.2.3.1.2 Operations

Herpetofauna

Amphibian breeding habitat was not identified within the Study Area and as such, no potential effects to herpetofauna are anticipated as a result of operation of the Project.

Migratory Breeding Birds

Breeding birds will not be significantly affected by the potential increase in noise and vibration during operations, as the species occurring within the vicinity of the rail corridor are tolerant to disturbances associated with urban settings.

Mammals

Bat maternity roosting habitat was not identified within the Study Area and as such, no potential effects to bat SAR are anticipated as a result of operation of the Project. No other mammal SAR were identified in the Study Area. Other mammal species that are common and widespread in urban areas (such as raccoons) are not anticipated to be affected by operation of the Project, as these species are highly tolerant and adapted to disturbances associated with urban settings.

Significant Wildlife Habitat

There were no SWHs identified within the Study Area that could be potentially affected by the Project and therefore no potential effects to SWHs are anticipated as a result of operation of the Project.

4.2.3.2 Mitigation and Monitoring

4.2.3.2.1 Construction

Herpetofauna

No mitigation measures are recommended, as no potential effects to herpetofauna are anticipated as a result of construction of the Project.

Migratory Breeding Birds

The following mitigation measures apply to all project components with respect to potential effects to breeding birds where vegetation removal may be required:

- To reduce the possibility of contravention of the *MBCA*, vegetation removal shall be scheduled to occur outside of the overall bird nesting season of April 1st to August 31st and strictly shall not occur within complex habitat[7] (i.e., the CUT1, CUW1, MAS2-1, MAM2 and FOD7 communities identified within the Study Area), see **Figure 3-2A** and **Figure 3-2B**, as defined by ECCC, during the core bird nesting season of May 1st to July 31st, when a minimum of 60% of nesting activity occurs in each of the three (3) habitat types, as per ECCC's Nesting Calendar for Zone C2 (ECCC, 2014). However, it should be noted that some birds may nest before and after this peak bird nesting season due to annual seasonal fluctuations. Therefore, if a nest of a migratory bird is found within the construction area outside of this nesting period it still receives protection.

- If vegetation must be removed during the overall bird nesting season:
  - Nest and nesting activity searches shall be conducted in areas defined as simple habitat[8] (i.e., the CUM1-1 communities and the bridge structure identified within the rail corridor, as well as

7. *Complex habitats are defined as large habitats with many potential nesting sites where the presence of nests would be too difficult to locate by qualified nest searchers due to obstructions in visibility (e.g., high vegetation cover). Examples of complex habitats include woodlands, grassland and meadows.*
8. *Simple habitats refer to habitats that contain few nesting spots or few species of migratory birds, where identification of active nests or confirmed nesting activity can be completed with confidence. According to ECCC (2014), examples of simple habitat include the following:*
   - *Urban parks consisting mostly of lawn with a few isolated trees;*
   - *Vacant lot with few possible nest sites;*
   - *Previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil); or*
   - *Structure such as a bridge, beacon, tower or building (often chosen as a nesting spot by robins, swallows, phoebes, nighthawks, gulls and others).*

isolated trees and shrubs along Burloak Drive) by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity shall be documented when it consists of confirmed breeding evidence, as defined by the Ontario Breeding Birds Atlas (OBBA) criteria (OBBA, 2001).

- If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal shall be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which shall be confirmed by a qualified Biologist, but shall protect a minimum of 10 m around the nest or nesting activity.
- The results of all nest searches shall be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites.

– If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same best management practices such as nest and nesting activity searches described above shall be undertaken.

Any bridge structures and other suitable man-made structures within the Study Area shall be inspected for evidence of active bird nests during the breeding bird season prior to the onset of construction activities in order to determine appropriate nesting preventative measures (e.g., netting).

Mammals

No mitigation measures are recommended, as no potential effects to mammals are anticipated as a result of construction of the Project.

Significant Wildlife Habitat

No mitigation measures are recommended as no SWHs are anticipated, given no SWH has been identified.

4.2.3.2.2 Operations

No mitigation measures are recommended during operations, as no potential effects to herpetofauna, breeding birds or mammals are anticipated as a result of operation of the Project, and no SWH was identified.

4.2.4 Fish and Fish Habitat

4.2.4.1 Potential Effects

No in-water works are proposed at the east branch of Sheldon Creek. Transition to the existing track will occur within 30 m west of the east branch of Sheldon Creek; however, none of the Project components are proposed to cross the east branch of Sheldon Creek itself. There are no specialized habitat features for aquatic species in the east branch of Sheldon Creek and construction activities are not anticipated to cause serious harm to CRA fishery. The following subsections outline the potential effects during construction and operations, propose mitigation to minimize effects and highlight the potential permitting needs for the Project as they relate to aquatic ecosystems.

4.2.4.1.1 Construction

The use of machinery in or around water poses risks of fuel contamination and spills from equipment use. Fuel contamination and spills of any kind can potentially limit aquatic species' ability to carry out their life processes. Removal of vegetation and earth moving activities may result in increased exposed soils and greater risk for soil erosion and sedimentation to the watercourse; however, the proposed construction is to the west of the east branch of Sheldon Creek and is not expected to disturb the riparian area along the western bank of the east branch of Sheldon Creek.

4.2.4.1.2 Operations

The potential operational effects of the Project will be negligible and are not expected to have any effect on the east branch of Sheldon Creek as the proposed track diversion is located west of the creek.

4.2.4.2 Mitigation and Monitoring

4.2.4.2.1 Construction

Timing of Construction Near Water

- Where feasible, follow best management practices for near water works. This includes working within permissible timing windows for the protection of the sensitive life stages/processes of migratory and resident fish. The east branch of Sheldon Creek has a warmwater thermal regime and therefore construction near the watercourse shall occur during July 1st to March 31st of any given year.

Erosion and Sediment Control

- When possible, construction activities near water shall be scheduled in order to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- An Erosion and Sediment Control Plan for the work site shall be prepared prior to and implemented during construction to minimize the risk of sedimentation to the waterbody during all phases of construction.
- Erosion and sediment control measures shall be maintained until all disturbed ground has been permanently stabilized. The Erosion and Sediment Control Plan shall, where applicable, include:
  - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the waterbody; and
  - Measures for managing water flowing onto the site;
- Measures shall be undertaken to contain and stabilize any waste material (e.g., construction waste and materials);
- Inspection and maintenance of erosion and sediment control measures and structures shall happen regularly (e.g., monthly) and after storm events during the course of construction;
- Repairs to erosion and sediment control measures and structures shall take place if damage occurs; and
- Erosion and sediment control materials shall be removed once site is stabilized.

Operation of Machinery

- Machinery shall arrive on site in a clean condition and be maintained free of fluid leaks, invasive species and noxious weeds. Machinery shall be washed, refuelled, and serviced properly away from any waterbody (at a minimum of 30 m). Storage of fuel and other materials for the machinery at least 30 m away from the watercourse and in such a way as to prevent any deleterious substances from entering the water;

- Activities near water shall be planned to ensure that materials such as paint, primers, blasting abrasives, rust, solvents, degreasers, grout or other chemicals do not enter the watercourse;
- A response plan for spills shall be developed before work commences. This plan shall be implemented immediately in the event of a sediment release or spill of a deleterious substance and an emergency spill kit shall be kept on site; and
- All construction materials shall be removed from site upon project completion.

Shoreline Revegetation and Stabilization

- Clearing of riparian vegetation shall be kept to a minimum, and existing trails, roads or pathways shall be used wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting, if required; and
- Watercourse banks disturbed by any activity associated with the Project shall be immediately stabilized to prevent erosion and/or sedimentation, and revegetated with native species suitable for the site.

4.2.4.2.2 Operations

No potential operational effects on aquatic species are likely as there are no changes to the operation of the existing tracks located over the east branch of Sheldon Creek.

4.2.5 Species at Risk (SAR) or Species of Conservation Concern (SOCC)

4.2.5.1 Potential Effects

4.2.5.1.1 Construction

Plant Species at Risk

No plant SAR or SOCC were identified during the background review or terrestrial field investigations (i.e., ELC and vascular plant inventory); as such, no potential effects on plant SAR or SOCC are anticipated as a result of construction of the Project.

Mammal Species at Risk

No suitable SAR bat roosting habitat was identified within the Study Area, and as such no effects on SAR bats are anticipated as a result of construction of the Project.

Bird Species at Risk

With respect to the active Barn Swallow nest observed under the rail bridge, it is recommended that the mitigation measures described in **Section 4.2.5.2** be implemented in order to avoid disturbance of the identified nest, incidental take, as well as contravention under Section 9 or 10 of the *ESA* (e.g., avoiding effects to individuals as well as to their protected habitats). No loss of the breeding habitat (e.g., the active Barn Swallow nests) is anticipated, as no bridges will be impacted by the Project.

A total of approximately 2.21 ha of foraging habitat for this species are proposed to be removed during the construction phase (CUM1, CUT1 and MAM2 communities; refer to **Table 4-1**). Foraging habitat for this species is not a limiting factor in and around the Study and Assessment Areas, thus effects are anticipated to be negligible.

As this species does not favour woodlands dominated by non-native tree species, the potential for Eastern Wood-pewee (*Contopus virens*) to occur within the cultural woodlands present within the Study Area is low. In anticipation of the presence of this species, however, it is recommended that the mitigation measures described below in **Section 4.2.5.2** be followed in order to avoid habitat loss resulting from construction of the Project and as a result, avoid effects to this species.

Aquatic Species at Risk

No aquatic SAR or SOCC were identified by DFO or MNRF and no in-water work is proposed, therefore no aquatic SAR or SOCC should be affected by the Project.

4.2.5.1.2 Operations

Plant Species at Risk

Plant SAR or SOCC were not identified within the Study Area; therefore no potential effects are anticipated as a result of operation of the Project.

Mammal Species at Risk

Suitable SAR bat roosting habitat was not identified within the Study Area and therefore no potential effects are anticipated as a result of operation of the Project.

Bird Species at Risk

Bird SAR or SOCC nesting in or immediately adjacent to the Study Area may be negatively affected by noise and vibration during operations. However, the potential operation effects are considered negligible, given that any individuals nesting in the area would exhibit high tolerance to the level of disturbance of anthropogenic activities in the general area.

Aquatic Species at Risk

No potential operational effects on aquatic SAR or SOCC are likely as there are no changes to the operation of the existing tracks located over the east branch of Sheldon Creek.

4.2.5.2 Mitigation and Monitoring

4.2.5.2.1 Construction

Plant Species at Risk

No mitigation measures are recommended as potential effects on plant SAR or SOCC are not anticipated as a result of construction of the Project, given that no plant SAR or SOCC were identified.

Mammal Species at Risk

No mitigation measures are recommended for mammals, as potential effects on SAR bats are not anticipated as a result of construction of the Project, given that no suitable SAR bat roosting habitat is anticipated to be present within the Study Area. However, as the MNRF has recently released new survey protocols for identifying bat habitat, the need for additional surveys shall be confirmed with the MNRF Aurora District Office during detailed design. Other mammal species that are common and widespread in urban areas (such as raccoons) are not anticipated to be affected by construction of the Project, as these species are highly tolerant and adapted to disturbances associated with urban settings.

Bird Species at Risk

Mitigation measures associated with vegetation removal as described in **Section 4.2.2.2** shall be implemented to reduce potential direct and indirect effects to SAR birds, in particular both the Barn Swallow and Eastern Wood-pewee. It is recommended that construction timing occur outside of the breeding season to ensure no impact to the breeding SAR birds, where possible, and where not possible that additional mitigation such as nest surveys be completed, as described in **Section 4.2.3.2**. It is recommended that vegetation removals avoid cultural woodlands to ensure no effects to the Eastern Wood-pewee potential habitat.

Aquatic Species at Risk

No specific mitigation and monitoring for aquatic SAR and/or SOCC is required during construction of the Project since no aquatic SAR or SOCC are present and no in-water works are proposed.

4.2.5.2.2 Operations

Plant Species at Risk

No mitigation measures are recommended for potential operational effects on plant SAR or SOCC, given that no plant SAR or SOCC were identified.

Mammal Species at Risk

No mitigation measures are recommended for potential operational effects on SAR bats, given that no trees suitable for SAR bat roosting habitat were observed within the Study Area.

Bird Species at Risk

No mitigation measures are recommended. Bird SAR will not be significantly affected by noise and vibration during operations, as the species occurring in the area within and in the vicinity of the Project are tolerant to disturbances associated with urban settings.

Aquatic Species at Risk

No specific mitigation and monitoring for aquatic SAR and/or SOCC is required during operation of the Project since no aquatic SAR or SOCC are present.

4.3 Geology and Groundwater

4.3.1 Potential Effects

4.3.1.1 Construction

Subsurface excavation below the water table may be required to allow for the construction of structural elements (e.g., embankments, foundations, footings, abutments and/or piers). As a result, construction dewatering may be required to achieve dry working conditions.

Construction dewatering activities have the potential to affect groundwater quantity, resulting in decreases in baseflow to watercourses, groundwater discharge to wetlands, yield of private water wells and groundwater flow patterns.

Where dewatering occurs, local water table elevations will be temporarily lowered to facilitate construction under dry conditions. These effects are confined to the Zone of Influence (ZOI) from dewatering activities and are typically temporary in nature.

Construction dewatering activities may also result in a decrease in groundwater contribution to groundwater-dependent natural features (e.g., wetlands, watercourses, ponds and lakes) resulting in declines in surface water levels/flow, temperature changes, and potential loss of habitat. Estimates of water taking quantities and resultant dewatering ZOI will be determined during detailed design.

There is a potential for sediments to enter watercourses as a result of site clearing, stockpiling, cut/fill activities, excavation and construction activities.

4.3.1.2 Operations

In areas where cut or fill is required that result in permanent changes to the original ground topography, corresponding changes to groundwater flow patterns (i.e., rate, direction, gradient, etc.) may occur. Since the proposed rail line will be constructed at the same grade as the existing rail, changes in groundwater flow patterns from the proposed expansion are expected to be negligible. Similarly, reduction in groundwater recharge as a result of increases in impervious surfaces or the placement of fill is considered to be negligible.

4.3.2 Mitigation and Monitoring

Estimates of water taking quantities and resultant dewatering ZOI would be determined during detailed design. As prescribed under *O. Reg. 63/16*, water taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through the Environmental Activity and Sector Registry (EASR). Where construction dewatering volumes are expected to exceed 400,000 L/day, a Category 3 PTTW shall be required from MOECC, in accordance with Section 34 of the *OWRA*. Similarly, approvals for the discharge of pumped water also may be required, which could include Municipal Discharge Permits and/or MOECC Environmental Compliance Approval (ECA) for dewatering effluent disposal, if required (*OWRA*, Section 53).

Requirements for monitoring during active construction dewatering for potential adverse effects shall be identified during detailed design.

If dewatering is required, a Dewatering Management Plan shall be prepared to provide the procedures and protocols to be implemented to ensure that all site dewatering activities are completed in a manner that does not cause harm to the environment and meets applicable by-laws, codes, regulations and standards, while preventing site flooding from groundwater infiltration.

Any discharge of water would be subject to the terms and conditions of all required permits and approvals obtained by the contractor based on the expected site conditions.

A Soil and Groundwater Management Plan shall be prepared to describe the general principles and develop specific protocols to address the handling, management and disposal of soil and groundwater that is generated or encountered during construction.

An Erosion and Sediment Control Plan shall be developed and shall include the requirement for a spill kit to be on site at all times during construction. Implementation of the erosion and sedimentation control measures shall conform to recognized standard specifications, such as Ontario Provincial Standards Specification (OPSS). Sediment and erosion control measures (e.g., silt curtains, silt fence) shall be installed prior to site clearing, grubbing, excavation or grading works. To ensure the Erosion and Sediment Control Plan is successfully performing, an Erosion and Sediment Control Monitoring Plan shall be implemented during construction.

A Spill Prevention and Response Plan shall be developed outlining steps to prevent and contain any chemicals and/or spills in a timely and effective manner and to avoid soil and water contamination.

4.4 Air Quality

4.4.1 Potential Effects

4.4.1.1 Construction

Construction activity creates and releases fine particulates and traces of other vapours (fugitive dust) into the surrounding community. Emissions from construction activity will be temporary and unlikely to have long-lasting effects on the surrounding area.

Fugitive dust emissions can result from movement of construction equipment and transport of materials to and from a construction site. Fugitive dust would generally be a problem during periods of intense construction activity and would be accentuated by windy and/or dry conditions.

Construction activities which potentially prove most impactful to the local air quality include, but are not limited to:

- Clearing and grubbing;
- Grading and rock blasting;
- Road and surface paving;
- Storage of granular material;
- Structure construction/deconstruction; and
- Mobile on-site equipment.

Construction activities will result in temporary traffic disruption and detour, which can lead to increased traffic congestion, thereby increasing motor vehicle exhaust emissions on nearby roads, and could result in elevated localized pollutant concentrations. The track diversion and detour of Burloak Drive at the grade crossing were not included in the assessment due to the temporary nature of the change. The impact to the air quality is expected to be insignificant.

Compared with emissions from other motor vehicle sources in the Air Quality Assessment Area, emissions from construction equipment and trucks are generally insignificant with respect to compliance with the Provincial and Federal ambient air quality standards.

4.4.1.2 Operations

Potential effects from the operation and implementation of the Project were assessed using emission inventories calculated using MOVES 2014a modelling software (US Environmental Protection Agency (EPA)), traffic projections for the Study Area provided in the Traffic Impact Assessment (**Appendix B8**), and dispersion modelling using AERMOD dispersion modelling software (US EPA, Lakes Environmental). Specific details on the emission inventories and modelling methodologies can be found in the Air Quality Assessment Report in **Appendix B3**.

The Air Quality Assessment Report concluded that potential effects from the implementation of the Project (i.e., Future Build-Out Conditions) resulted in lower impacts to the local community than the potential effects without the implementation of the Project (i.e., Future No-Build Conditions). This is due to the reduced idling emissions from vehicles waiting during train crossing events.

The Project's implementation is expected to result in minor contributions to the local air quality in comparison to the Provincial and Federal ambient air quality standards.

4.4.2 Mitigation and Monitoring

4.4.2.1 Construction

The anticipated temporary construction activity does not appear to be exceptional or atypical for this type of project. However, the close proximity of construction activities to nearby residences, businesses, and other areas where the general public has reasonable access creates the need for appropriate mitigation measures to be implemented during construction.

Factors that affect the local impacts of construction activity include the proximity of a receptor to the construction site, the hours of operation of the construction site, the number of machines running or activities occurring on a construction site at any given time, and the meteorological conditions at which those activities or operations occur.

An Air Quality Management Plan shall be developed to address the areas of construction equipment and vehicle exhaust, potential traffic disruption and congestion, fugitive dust, and odor. It is further recommended that mitigation measures detailed in "*Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (March 2005)"* prepared by Cheminfo for Environment Canada be implemented, where practical. Potential mitigation measures for these areas are discussed below.

Construction Equipment and Vehicle Exhaust

Environment Canada adopted amendments to the Off-Road Compression-Ignition Engine Emission Regulations which align Canadian emission standards with the US EPA Tier 4 standards for non-road engines, including the emission limits, testing methods and effective dates. The Regulations Amending the Off-Road Compression-Ignition Engine Emission Regulations (the Amendments) impose stricter standards and new requirements starting with engines of the 2012 and later model years.

All equipment and vehicles shall be kept properly maintained and repaired to minimize exhaust emissions, including odours.

Excessive idling of vehicles and equipment (greater than five minutes) shall be minimized. Other potential mitigation measures may include the use of alternative-fueled or electric equipment where feasible.

Fugitive Dust

Implementing good practices including wetting exposed earth areas; covering dust-producing materials during transport; and limiting construction activities during high wind conditions will minimize the impacts of fugitive dust. Potential mitigation measures that may be employed by the construction contractor to reduce fugitive dust issues include:

- Seeding, paving, covering, wetting, or otherwise treating disturbed soil surfaces;
- Minimizing storage and unnecessary transfers of spoils and debris on-site;
- Using wind screens or fences;
- Covering all truckloads of dust-producing material;
- Removing all loose or unsecured debris or materials from empty trucks prior to leaving the site;
- Reducing traffic speeds on any unpaved surfaces;

- Vacuum sweeping or watering of all paved surfaces and roads on which equipment and truck traffic enter and leave the construction areas;
- Using wheel washes and truck washes at site egresses;
- Modifying work schedules when weather conditions could lead to adverse impacts (e.g., very dry soil and high winds); and
- Ensuring that the areas most impacted by particulate levels are vegetated (i.e., tree planting) to reduce the cumulative particulate impacts.

Greenhouse Gases

The Project is not anticipated to produce significant GHG emissions throughout the construction phase of the Project. As a result, mitigation during construction is not required. Climate change considerations are discussed in **Section 5**.

4.4.2.2 Operations

The implementation of the Project is expected to result in a decrease of air emissions in the long-term, when compared to the alternative of maintaining the existing at-grade rail crossing configuration. In addition, the contribution from the Project to the local air quality is insignificant in comparison to the existing background air quality concentrations. Public transportation is a beneficial service that can reduce traffic congestion and lessen the need for new and expensive road infrastructure, as well as decrease carbon emissions and air quality concerns associated with automobile use. Specific mitigation measures for the Project's long-term operation are therefore not recommended or required, as the implementation of the Project will address concerns for the local air quality by reducing idling times and increasing overall traffic flow in the region.

4.5 Noise and Vibration

4.5.1 Potential Effects

4.5.1.1 Construction Noise

Construction noise levels were predicted at the worst-case noise-sensitive receivers for construction equipment operating at the closest possible operating distances. The maximum anticipated construction noise is predicted to be significantly higher than the existing noise levels at the assessed points of reception (5555 Prince William Drive Unit 19 and 5892 Prince William Drive). The results are presented **in Table 4-2** and **Table 4-3**.

Temporary construction noise impacts are anticipated to be significantly higher than the assumed baseline levels at the assessed points of reception during both road and temporary detour construction. Predicted noise levels exceed the US FTA guideline limit of 80 dBA $L_{eq,8hr}$ for daytime road and detour infrastructure construction work at the nearest assessed location (R1). Predicted road and temporary detour construction noise levels exceed the US FTA guideline limit of 70 dBA $L_{eq,8hr}$ for night-time construction work at both assessed locations. During railway structure construction, noise may be audible but is predicted to be below the recommended limits at all times.

Construction noise levels are expected to be lower than those presented in **Table 4-2** and **Table 4-3** because the predictions are based on the assumed equipment operating together at the same worst case set-back distance, rather than distributed around the work site.

Additional details are described in the Noise and Vibration Effects Assessment (**Appendix B4**).

Table 4-2: Predicted Construction Noise Levels – Construction and Temporary Detour and Diversion

ID	Assessed Point of Reception	Assumed Set-back Distance (m)	Assumed Baseline Noise Level (dBA $L_{eq,1hr}$)		Site Preparation and Utility Relocation	Temp. Staging Roads and Track Diversion	Excavation and Grading	Retaining Walls, Augered Piles – Shoring & Foundations	FTA Guideline Noise Limits (dBA $L_{eq, 8hr}$)	
			Daytime (07:00-23:00)	*Night-time (23:00-07:00)*					*Daytime (07:00-23:00)*	*Night-time (23:00-07:00)*
R1	Unit 19, #5555 Prince William Drive	20	55	50	85.5	84.8	84.7	82.2	80	70
R2	#5892 Prince William Drive	65	55	50	75.3	74.5	74.5	71.9	80	70

Table 4-3: Predicted Construction Noise Levels – Railway Structure Construction

ID	Assessed Point of Reception	Assumed Set-back Distance (m)	Assumed Baseline Noise Level (dBA $L_{eq,1hr}$)		Concrete Abutments	Span Installation	Track Installation	FTA Guideline Noise Limits (dBA $L_{eq, 8hr}$)	
			Daytime (07:00-23:00)	*Night-time (23:00-07:00)*				*Daytime (07:00-23:00)*	*Night-time (23:00-07:00)*
R1	Unit 19, #5555 Prince William Drive	184	55	50	61.8	56.0	63.0	80	70
R2	#5892 Prince William Drive	343	55	50	56.4	50.6	57.6	80	70

4.5.1.2 Construction Vibration

Across all site locations and phases of construction, the use of a vibratory roller is anticipated to generate the highest construction vibration levels. The predictable worst case construction vibration levels are presented in **Table 4-4** for the most affected points of reception during the construction.

Table 4-4: Predicted Construction Vibration Impacts

ID	Assessed Point of Reception	Assumed Set-back Distance (m)	Predicted Vibration Level (Vibratory Roller) (mm/s)		Vibration Zone of Influence Threshold (mm/s PPV)
			Peak Particle Velocity (PPV)	*Root-Mean-Square Velocity (RMSV)*	
R1	Unit 19, #5555 Prince William Drive	20	1.25	0.31	5
R2	#5892 Prince William Drive	65	0.21	0.05	5
V1	#835 Syscon Court (industrial building)	35	0.54	0.14	5
V2	#738 Burloak Drive (commercial plaza)	12	2.70	0.67	5

Construction vibration PPV levels are predicted to be lower than the adopted vibration zone of influence threshold (5 mm/s) at all assessed points of reception. The RMSV vibration levels are predicted to be above the human perceptibility threshold of 0.1 mm/s at receptors closer than 40 m from vibratory rollers and other similar equipment. Beyond 40 m, the predicted vibration level from operation of a vibratory roller is predicted to be below 0.1 mm/s RMSV. The other construction equipment assessed generates significantly lower vibration levels. Some temporary disturbance may be expected at these locations. Building occupants may be able to feel some vibrations but people are sensitive to vibration at much lower levels than can cause building damage. The vibration impacts are not considered to be significant, given their low level and temporary nature.

4.5.1.3 Operations Noise

Table 4-5 below outlines the predicted noise levels and impacts. Where impacts of 5 dB or more are predicted, mitigation investigation is required according to the MTO/MOE Protocol.

Table 4-5: Predicted Operational Noise Impacts

ID	Assessed Point of Reception	Predicted Noise Level (dBA) Future No Build	Predicted Noise Level (dBA) Future Build	Predicted Noise Impact (dB)	Noise Impact Threshold for Mitigation Investigation (dB)	Mitigation Investigation Requirement (Yes/No)
R1	Unit 19, #5555 Prince William Drive	55.0	53.1	-1.9	5	No
R2	#5892 Prince William Drive	63.9	63.8	-0.1	5	No

Marginal reductions in road traffic noise levels are predicted at the assessed points of reception, so the noise impacts are anticipated to be insignificant. The traffic volumes are not significantly higher as a result of the Project and the lower road retaining wall acts as a barrier, providing screening noise attenuation. As the impacts are less than 5 dB there is no requirement for mitigation.

4.5.1.4 Operations Vibration

No long-term track alignment or profile changes are anticipated as part of the Project, so no change in individual train pass-by vibration levels will be expected. In terms of the change in road design for the grade separation, operational vibration from rubber tire vehicles is typically not a concern for this type of project. Most vibration or groundborne noise problems are related directly to discontinuities in the road surface (e.g., potholes, bumps, or expansion joint). Since the Project will remove the at-grade crossing, the discontinuities in the road will be eliminated at this location.

Corridor track and road maintenance operations are not considered a regularly occurring event, and thus would not be subject to the same objective limits as typical operations. As short term events, maintenance would be considered in the same way as construction. Maintenance activities are generally not expected to result in vibration levels as high as construction activities because maintenance activities will be significantly less intensive with generally lower energy equipment. In addition, maintenance activities will likely be of shorter duration than construction, so the potential impacts would not be expected to be as severe.

4.5.2 Mitigation and Monitoring

4.5.2.1 Construction Noise

Noise from construction activities shall be controlled to ensure that the guideline limits are not exceeded, where possible. Construction noise can be controlled in numerous ways, including operational restrictions and source mitigation measures, as well as receptor-based mitigation measures. Prior to construction, a Noise and Vibration Control Plan shall be developed to reduce the noise impacts at sensitive receptors. The plan shall include the following details:

- What measures are being taken to comply with local by-laws whenever possible (e.g., road construction activities during the day instead of at night);
- If construction needs to be undertaken outside of the normal daytime hours, how local residents will be informed beforehand of the type of construction planned and the expected duration;
- How construction equipment shall meet the noise level specifications in MOECC guidelines NPC-115 and NPC-118;
- What noise control measures are being implemented, e.g.,:
  - Implement noise compliance checks to ensure equipment levels are in compliance with MOECC guidelines NPC-115 and NPC-118;
  - Keep equipment well-maintained and fitted with efficient muffling devices;
  - Restrict idling of equipment to the minimum necessary to perform the specified work;
  - Avoid unnecessary revving of engines and switch off equipment when not required (do not idle);
  - Co-ordinate ‘noisy’ operations such that they shall not occur simultaneously, where possible;
  - Use rubber linings in chutes and dumpers to reduce impact noise, where possible;
  - Minimize drop heights of materials; and
  - Route haulage/dump trucks on main roads where possible, rather than quieter residential roads.
- Development of a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable noise levels at noise sensitive receivers are maintained for the duration of construction.

Note that Ministry of Labour requirements and Ontario’s Occupational Health & Safety Act and Regulations (*O. Reg. 231/91-105*) specify obligations for dump trucks to be equipped with automatic audible reversal alarms when operated in reverse.

During construction work, if it is determined that there is a need to further reduce noise effects, additional mitigation measures may be considered and implemented, where appropriate.

4.5.2.2 Construction Vibration

Prior to construction, a Noise and Vibration Control Plan shall be developed to reduce potential disturbance to nearby building occupants. The plan shall address the following measures:

- What measures are being taken to comply with local by-laws whenever possible (e.g., road construction activities during the day instead of at night);
- If construction needs to be undertaken outside of the normal daytime hours, how will local residents be informed beforehand of the type of construction planned and the expected duration;
- What vibration control measures are being implemented, e.g.:
  - Consider the use of construction methods which may minimize vibration, where possible; and
  - Use lower vibration-generating equipment where practical;
- Development of a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable vibration levels at sensitive receivers are maintained for the duration of construction.

Blasting operations are typically prohibited by the City of Burlington and Town of Oakville; however, if blasting is unavoidable, the Contractor must obtain approval from the municipalities, and undertake a detailed impact assessment and implement appropriate mitigation measures to ensure compliance with local by-laws and MOECC guidelines, including NPC-119 *Blasting*, included in the Model Municipal Noise Control By-law.

No specific construction vibration mitigation measures are anticipated to be required to address potential building damage, assuming there will be no impact or vibratory pile driving, and vibratory rollers shall be set back at least 8 m from existing structures and buildings.

During construction work, if it is determined that there is a need to further reduce vibration effects, additional mitigation measures may be considered and implemented, where appropriate.

4.5.2.3 Operations Noise

No specific operational noise mitigation measures are anticipated to be required. The construction noise mitigation measures outlined in **Section 4.5.2.1** shall also be implemented during maintenance activities, where appropriate.

4.5.2.4 Operations Vibration

No specific operational vibration mitigation measures are anticipated to be required. The construction vibration mitigation measures outlined in **Section 4.5.2.2** shall also be implemented during maintenance activities, where appropriate.

4.6 Socio-economic and Land Use Characteristics

This section assesses the potential socio-economic and land use effects associated with construction and operations of the Project. Where significant negative effects are predicted, appropriate mitigation measures and/or monitoring is proposed for the appropriate Project phase with the aim of reducing or eliminating adverse effects.

Full details of noise and vibration, air quality and traffic effects and mitigation/monitoring measures are outlined in other technical reports completed as part of the TPAP and included as appendices to the EPR.

4.6.1 Community Features

4.6.1.1 Potential Effects

4.6.1.1.1 Construction

The maximum anticipated construction noise is predicted to be significantly higher than the existing noise levels at the assessed points of reception (5555 Prince William Drive Unit 19 and 5892 Prince William Drive). Building occupants may be able to feel some effects of vibratory roller (to be used across all site locations and phases of construction); however, these effects are considered insignificant, given their low and temporary nature, and are not expected to result in any building or structural damage. These effects are typical of a project of this nature. Additional details are described in the Noise and Vibration Effects Assessment (**Appendix B4**).

Local residents may experience temporary minor traffic effects during construction activities. Traffic effects are discussed in **Section 4.6.6**. Additional details related to potential construction effects are described in the Traffic Impact Assessment (**Appendix B8**).

4.6.1.1.2 Operations

No negative effects are anticipated to community features during operations.

Long-term noise effects are not anticipated, as the proposed retaining walls will help mitigate noise impacts from increased traffic. Potential effects to local residents are anticipated to be positive with increased capacity along Burloak Drive and intersection improvements resulting from the proposed Project.

Aesthetic effects to community features are not anticipated during operation of the Project.

4.6.1.2 Mitigation and Monitoring

4.6.1.2.1 Construction

Section 4.6.2.2 describes mitigation for construction activities which may affect local residents.

4.6.1.2.2 Operations

Mitigation and monitoring is not required for community features during operation of the Project, as no negative effects are predicted.

4.6.2 Existing Land Use

4.6.2.1 Residential

4.6.2.1.1 Potential Effects

Construction

The maximum anticipated construction noise is predicted to be significantly higher than the existing noise levels at the assessed points of reception (5555 Prince William Drive Unit 19 and 5892 Prince William Drive). Building occupants may be able to feel some effects of vibratory roller (to be used across all site locations and phases of construction); however, these effects are considered insignificant, given their low and temporary nature, and are not

expected to result in any building or structural damage. These effects are typical of a project of this nature. Additional details are described in **Appendix B4**.

Residences with direct views of the Burloak Drive rail crossing are anticipated to experience some aesthetic effects as a result of construction activities. Aesthetic effects during construction are described further in **Section 4.6.3.1**.

Operations

No negative effects to residential land uses are anticipated during operations.

Long-term noise effects are not anticipated, as the proposed retaining walls will help mitigate noise impacts from increased traffic. Potential effects to surrounding residences are anticipated to be positive with increased road capacity and reduced queuing along Burloak Drive resulting from the proposed Project.

Aesthetic effects to residential areas are not anticipated during operation of the Project.

4.6.2.1.2 Mitigation and Monitoring

Construction

Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan and other specific mitigation measures described in **Appendix B4**. Vibration effects are considered to be low impact (e.g., no pile driving activities); therefore, specific construction mitigation is not required.

Access to residences shall be maintained at all times. Local residents potentially affected by construction nuisance effects shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.

Operations

Mitigation and monitoring is not required for residential land uses during operation of the Project, as no negative effects are predicted.

4.6.2.2 Commercial

4.6.2.2.1 Potential Effects

Construction

Businesses within the Assessment Area may experience temporary nuisance effects resulting from increased noise and vibration levels due to construction equipment and activities; however, these effects are considered insignificant, given their low and temporary nature. Additional details are described in **Appendix B4**.

The temporary detour of Burloak Drive to the east during construction may affect signage visibility west of Burloak Drive and perceived access to businesses. Additional details related to potential construction effects are described in **Appendix B8**.

The construction associated with the Project will result in direct and indirect economic benefits. Construction activities will result in additional employment opportunities, and construction workers will provide some additional revenue opportunities to local businesses with respect to various supplies required and restaurant/food establishments.

Operations

No negative effects to commercial land uses are anticipated during operations.

Long-term noise effects are not anticipated, as the proposed retaining walls will help mitigate noise impacts from increased traffic. Potential effects to surrounding businesses are anticipated to be positive with increased road capacity and reduced queuing along Burloak Drive resulting from the proposed Project. Improved conditions on Burloak Drive as a result of the Project may incentivize developers to develop existing undeveloped land within the Assessment Area.

The underpass will cause a slight reduction in commercial signage visibility from Burloak Drive.

4.6.2.2.2 Mitigation and Monitoring

Construction

Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan and other specific mitigation measures described in **Appendix B4**. Vibration effects are considered to be low impact (e.g., no pile driving activities); therefore, specific construction mitigation is not required.

Access to businesses shall be maintained at all times. Potentially affected business owners shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.

Operations

Mitigation and monitoring is not required for commercial land uses during operation of the Project, as only minor negative effects are predicted.

4.6.2.3 Industrial

4.6.2.3.1 Potential Effects

Construction

Local industry may experience temporary minor traffic effects during construction activities. Traffic effects are discussed in **Section 4.6.6**. Additional details related to potential construction effects are described in **Appendix B8**.

Operations

Trucks using Burloak Drive to transport oversize loads may experience limitations due to height restrictions of the proposed underpass.

Improved conditions on Burloak Drive as a result of the Project (e.g., increased road capacity, reduced queuing) are anticipated to generally have a positive effect on transportation of goods in the area.

4.6.2.3.2 Mitigation and Monitoring

Construction

Transport trucks will use the temporary Burloak Drive road detour. Access to industrial areas shall be maintained at all times. Potentially affected stakeholders shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.

Operations

During stakeholder consultation, it was confirmed that additional clearance cannot be provided to accommodate Zeton Inc.'s oversize trucks. Metrolinx shall continue to consult with Zeton Inc. and other affected stakeholders to explore alternate solutions, where possible.

4.6.2.4 Employment Areas

4.6.2.4.1 Potential Effects

Construction

Businesses within the Assessment Area may experience temporary nuisance effects resulting from increased noise and vibration levels due to construction equipment and activities; however, these effects are considered insignificant, given their low and temporary nature. Additional details are described in **Appendix B4**.

Businesses within the Assessment Area may experience temporary nuisance effects resulting from the temporary detouring of Burloak Drive. Additional details related to potential construction effects are described in **Appendix B8**.

Operations

No negative effects to employment areas are anticipated during operations.

Long-term noise effects are not anticipated, as the proposed retaining walls will help mitigate noise impacts from increased traffic. Potential effects to surrounding businesses are anticipated to be positive with increased road capacity and reduced queuing along Burloak Drive resulting from the proposed Project. Intersection improvements at Prince William Drive / Superior Court (i.e., addition of second left-turn lane southbound on Burloak Drive) will benefit the employment area on Superior Court.

4.6.2.4.2 Mitigation and Monitoring

Construction

Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan and other specific mitigation measures described in **Appendix B4**. Vibration effects are considered to be low impact (e.g., no pile driving activities); therefore, specific construction mitigation is not required.

Access to employment areas shall be maintained at all times. Potentially affected stakeholders shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.

Operations

Mitigation and monitoring is not required for employment areas during operation of the Project, as no negative effects are predicted.

4.6.2.5 Institutional

There are no institutional uses located in the Assessment Area.

4.6.2.6 Recreational

4.6.2.6.1 Potential Effects

Construction

The multi-use path on the west side of Burloak Drive shall be reconstructed under the new bridge. It is anticipated that there will be temporary effects to users of the multi-use path, as the path will be moved to the east side during construction. Pedestrians and cyclists who use the multi-use path on the west side of Burloak Drive will need to cross Burloak Drive at Superior Court or Prince William Drive to access the temporary multi-use path. Additional details related to potential construction effects are described in **Appendix B8**.

Enjoyment of Sherwood Forest Park may be affected by increased noise and vibration levels and effects to visual aesthetics due to construction activities. Additional details related to potential construction effects are described in **Appendix B4**. Aesthetic effects during construction are described further in **Section 4.6.3**.

Operations

No negative effects to recreational land uses are anticipated during operations.

Long-term noise effects are not anticipated, as the proposed retaining walls will help mitigate noise impacts from increased traffic. Improved active transportation facilities on Burloak Drive as a result of the Project (i.e., new multi-use path on east side of Burloak Drive) are anticipated to have a positive effect on recreational uses.

4.6.2.6.2 Mitigation and Monitoring

Construction

At a minimum, safety fencing shall be used where necessary to separate the work area from pedestrians and/or cyclists. Construction signage shall also be utilized. Special directional signage may also be considered as a means to indicate re-routing of the multi-use path.

Operations

Mitigation and monitoring is not required during operation of the Project, as no negative effects are anticipated.

4.6.2.7 Parks and Open Space

4.6.2.7.1 Potential Effects

Construction

The Tree Inventory Plan (**Appendix B2**) indicates that 160 trees may be impacted based on the current preliminary design. Once the design progresses, an Arborist Report shall be completed to identify which trees will be preserved or removed.

Given the highly-developed landscape, the Assessment Area is largely comprised of vegetation that tolerates frequent disturbance and is quick to recolonize; therefore, potential effects to vegetation in parks and open space are not anticipated to be significant. Additional details related to potential construction effects are described in the Natural Environment Report (**Appendix B1**).

Construction activities may encroach on the soccer playing field in Sherwood Forest Park, as a narrow strip of land along the northern boundary will be used for construction of temporary ditching to facilitate the temporary track diversion.

Operations

No negative effects to parks and open spaces are anticipated during operation of the Project.

4.6.2.7.2 Mitigation and Monitoring

Construction

Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx GO Expansion Program projects, and vegetation that is removed during construction shall be compensated for in accordance with the provisions of this protocol. These are:

- **For Municipal/Private Trees**:
  Metrolinx shall work with each municipality to develop a municipality-wide streamlined tree permitting/compensation approach for municipal and private trees. The goal is to reduce administrative permitting burden for trees along long stretches of rail corridor.
- **For Trees within Metrolinx Property**:
  Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing tree community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan.
- **Conservation Authorities**:
  For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements shall be followed.
- **Federal Lands**:
  For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements shall be followed.
- **Tree End Use**:
  Metrolinx shall develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options).

In addition, specific mitigation and monitoring for vegetation removal during construction is provided in the Natural Environment Report (**Appendix B1**).

If impacts to the soccer field in Sherwood Forest Park occur, the soccer field will be relocated to the south to retain its use.

Operations

Refer to **Section 4.2.2.1** for details related to Metrolinx's Vegetation Compensation Protocol to be implemented during operation of the Project (e.g., tree compensation planting and monitoring of planted trees).

4.6.3 Aesthetics / Visual Character

4.6.3.1 Potential Effects

4.6.3.1.1 Construction

Construction activities, including the use of construction equipment, staging areas, and temporary fencing, may result in temporary aesthetic effects for local residents. Visual impacts may affect user enjoyment of Sherwood Forest Park.

4.6.3.1.2 Operations

Retaining walls will be constructed as part of the Project, which will cause a slight reduction in commercial signage visibility from Burloak Drive.

4.6.3.2 Mitigation and Monitoring

4.6.3.2.1 Construction

The presence of construction equipment will result in temporary and intermittent effects; therefore, mitigation measures are not required. Tree/vegetation removal as a result of this Project shall be addressed and compensated for through Metrolinx's Vegetation Compensation Protocol (**Section 4.6.2.7.2**).

4.6.3.2.2 Operations

The aesthetics of retaining walls shall be finalized during detailed design in consultation with City of Burlington and Town of Oakville.

4.6.4 Property

4.6.4.1 Potential Effects

4.6.4.1.1 Construction

During construction of the Project, there will be a temporary 3-track diversion south of the existing Lakeshore West Rail Corridor tracks and a temporary 4-lane road detour to the east of Burloak Drive.

Access to the following properties will be temporarily impacted during construction as result of the road detour:

- Petro Canada gas station (current entrance to/from Burloak Drive shall be maintained while temporary road detour is in place; however, will be closed during regrading of the entrance);
- Undeveloped lands located at 845 Burloak Drive, east of Burloak Drive between Wyecroft Road and the Lakeshore West Rail Corridor (current entrance to/from Burloak Drive removed); and
- Undeveloped lands located at 605 Burloak Drive, east of Burloak Drive between the Lakeshore West Rail Corridor and HONI corridor (current entrance to/from Burloak Drive removed).

In addition, there is potential for the access to the existing Burloak Common off of Burloak Drive to be impacted during construction; however, it is expected to be maintained.

The 3-track diversion will require temporary easements; however, no property acquisitions are anticipated for construction. The following properties will require temporary easements to accommodate the road detour:

- Parcel owned by the Town of Oakville located immediately east of Burloak Drive between the Highway 403/QEW east on-ramp and Wyecroft Road;
- Parcels owned by the Town of Oakville located immediately east of Burloak Drive between Wyecroft Road and the Lakeshore West Rail Corridor;
- Parcels owned by the Town of Oakville located immediately east of Burloak Drive between the Lakeshore West Rail Corridor and Superior Court;
- Parcels owned by the Town of Oakville located immediately east of Burloak Drive south of Superior Court;
- Privately-owned undeveloped lands located at 845 Burloak Drive;
- Privately-owned undeveloped lands located at 605 Burloak Drive; and
- Parcel owned by HONI located east of Burloak Drive south of the Lakeshore West Rail Corridor.

4.6.4.1.2 Operations

Access to the following properties from Burloak Drive will be permanently impacted to accommodate the road widening and construction of new retaining walls:

- Petro Canada gas station (current entrance to/from Burloak Drive regraded)
- Undeveloped lands located at 845 Burloak Drive (current entrance to/from Burloak Drive permanently removed)
- Undeveloped lands located at 605 Burloak Drive (current entrance to/from Burloak Drive permanently removed)

Ongoing access to Burloak Common from Burloak Drive shall be restored to its current configuration if temporarily altered during construction.

Permanent property acquisition is not anticipated as part of the Project; however, permanent easements may be required as a result of utilities relocation (see **Section 4.6.5**).

4.6.4.2 Mitigation and Monitoring

4.6.4.2.1 Construction

Properties with temporary access impacts (described in **Section 4.6.4.1.1**) will be required to use alternate access points during construction. The following proposed access mitigation shall be determined in consultation with the affected municipality and property owners:

- Petro Canada gas station (during regrading of entrance, access will be to/from the existing Wyecroft Road entrance)
- Undeveloped lands located at 845 Burloak Drive (property could be accessed via the existing Wyecroft Road entrance)
- Undeveloped lands located at 605 Burloak Drive (property could be accessed from the south through adjacent lands fronting onto Superior Court)

In the event that the Burloak Drive entrance to/from Burloak Common is impacted during construction, access shall be maintained using the existing secondary entrance off of Prince William Drive. Access to the Emshih Developments site (i.e., between Sherwood Forest Park and Burloak Drive) will be maintained during construction.

Where property easements are required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. Communications with stakeholders to identify local and site-specific issues may include discussions on topics such as:

- Construction access;
- Construction schedule; and
- Enquiries/complaint procedures.

4.6.4.2.2 Operations

Permanent access impacts as a result of the Project (described in **Section 4.6.4.1.2**) will be required to use alternate access points following construction. The following proposed access mitigation shall be determined in consultation with the affected municipality and property owners:

- Undeveloped lands located at 845 Burloak Drive (property could be accessed via the existing Wyecroft Road entrance; in addition, replacement entrance could be located at the north boundary of the property)
- Undeveloped lands located at 605 Burloak Drive (property could be accessed from the south through adjacent lands fronting onto Superior Court)

Following construction, the Petro Canada gas station access from Burloak Drive will be restored at its current location with an increased driveway slope.

There is currently no access to the Emshih Developments site (north of Burloak Common). Future access may be provided through existing Burloak Common access.

For temporary access during Project operations and maintenance activities, agreements with adjacent property owners may be required for permanent easements.

4.6.5 Utilities

4.6.5.1 Potential Effects

4.6.5.1.1 Construction

All utilities within the Assessment Area (sewers, hydro, natural gas, and communication) will be relocated in advance of the grade separation construction, with the exception of the Halton Region watermain, which is approximately 29 m below grade and will not be impacted by the construction of an underpass. In addition to third party and municipal utilities, the existing signal, power, and communication cabling within the Assessment Area will require protection and relocation as required to facilitate the construction of the temporary diversion and proposed grade separation structure. The existing overhead hydro lines which run parallel to Burloak Drive on the east side will also require relocation.

The three (3) underground oil pipelines within the Assessment Area will not be impacted by the Project.

The natural gas feed pipes will be removed under enabling works contract associated with the relocation of the existing Burloak Interlocking Plant. A portion of the carrier pipe will also need to be removed / relocated as required.

The existing TNPI infrastructure within the Assessment Area will not be affected (or relocated), as soil depth covering the pipeline will be sufficient to protect it as per TNPI's requirements.

Any service interruptions to residents and businesses will be identified during detailed design.

4.6.5.1.2 Operations

Access to utilities may require temporary access permission (easements) for maintenance activities within the Assessment Area.

4.6.5.2 Mitigation and Monitoring

4.6.5.2.1 Construction

Additional subsurface utility engineering (SUE) investigations may be conducted during detailed design, as required, to confirm existing utilities.

During detailed design, the municipalities will continue to be consulted regarding utilities.

4.6.5.2.2 Operations

Once utility conflicts have been identified and resolved, no further mitigation measures related to utilities are required for operations. Potential access requirements as a result of maintenance within the Assessment Area will be determined in consultation with relevant utility owners.

4.6.6 Transportation

4.6.6.1 Road Volumes and Traffic Operations

4.6.6.1.1 Potential Effects

4.6.6.1.2 Construction

Traffic will be diverted during construction (anticipated construction timeline 2019 to 2022).

Access to the construction site is expected to be from the southbound lanes. Construction material will likely be hauled from the QEW southbound on Burloak Drive to the Project site. All vehicles leaving the site will head south on Burloak Drive towards Rebecca Street / New Street.

It is anticipated that arrival and departure of construction staff will be staged to occur outside of peak periods (8:00AM-9:00AM and 5:00PM-6:00PM). It is anticipated that the additional vehicles will not create a capacity issue on Burloak Drive. At the intersections, the additional construction traffic is expected to be through movements and there is sufficient capacity based on the current lane configurations and signal timing for the few additional construction-related vehicles.

4.6.6.1.3 Operations

The Project will improve traffic conditions within the Study Area and the Assessment Area as vehicles will no longer have to stop at the rail crossing for trains to pass.

At Burloak Drive and Harvester Road / Wyecroft Road, the addition of a second southbound left-turn lane would alleviate some of the delay experienced in the AM peak period. There will still be some queueing and delay in the peak periods, but fewer vehicles will be affected.

4.6.6.1.4 Mitigation and Monitoring

4.6.6.1.5 Construction

Vehicles will be redirected around the construction site using a temporary road detour with the same number of lanes as the existing configuration.

No capacity issues were identified on Burloak Drive or at surrounding intersections; therefore, no mitigation measures are required during construction.

4.6.6.1.6 Operations

All traffic signals shall be optimized post-construction to accommodate the increase in traffic and additional lanes.

4.6.6.2 Public Transit Service

4.6.6.2.1 Potential Effects

4.6.6.2.2 Construction

Burlington Transit will be largely unaffected by the construction. The two (2) routes along Burloak Drive (#81 and #83) both operate north of Harvester Road and will not traverse the temporary road detour.

Oakville Transit will be affected by the construction. The routes along Burloak Drive (#14, #14A and #15) operate south of Harvester Road with transit stops on both sides of Wyecroft Road, Superior Court, and Michigan Drive. The Route #15 transit stops on Wyecroft Road (transit stop 2322) and on Burloak Drive at Prince William Drive (transit stop 2325) may warrant relocation during construction.

4.6.6.2.3 Operations

No effects are anticipated to transit operations following construction of the Project.

4.6.6.2.4 Mitigation and Monitoring

4.6.6.2.5 Construction

The transit stop at Burloak Drive and Wyecroft Road (transit stop 2322) may be relocated onto Wyecroft Road east of the intersection. The transit stop on Burloak Drive at Prince William Drive (transit stop 2325) may be relocated south of the intersection. These relocations will be confirmed through consultation with affected municipalities during detailed design.

During construction, a temporary transit shuttle service will be provided in the Town of Oakville during the full road closures.

Metrolinx shall consult with Burlington Transit and Oakville Transit through construction meetings to determine if service modification is required and provide advance notification of construction works to the public.

4.6.6.2.6 Operations

All displaced transit stops will be rebuilt to municipality standards following construction. No further mitigation and monitoring is not required for transit service during operation of the Project, as no negative effects are predicted.

4.6.6.3 Active Transportation

4.6.6.3.1 Potential Effects

4.6.6.3.2 Construction

Pedestrians and cyclists who normally use the sidewalks on the west side of Burloak Drive will need to cross Burloak Drive at Harvester Road or Prince William Drive to access the temporary multi-use path on the east side.

4.6.6.3.3 Operations

A new multi-use path on the east side of Burloak Drive will improve active transportation opportunities.

4.6.6.3.4 Mitigation and Monitoring

4.6.6.3.5 Construction

A multi-use path will be constructed along the east side of the temporary road detour to provide a temporary pedestrian/cyclist route during construction.

A Construction Traffic Management Plan shall be completed prior to construction, which shall include construction signage and safety fencing requirements.

In 2018, an updated City of Burlington Master Cycling Plan will be released. Information from this document should be considered during detailed design.

4.6.6.3.6 Operations

Mitigation and monitoring is not required for active transportation during operation of the Project, as no negative effects are anticipated.

4.7 Cultural Heritage

4.7.1 Potential Effects

Potential effects to cultural heritage value or interest of a property were assessed during the CHSR. The CHSR is provided in **Appendix B6**.

Based on the completed Data Sheets and Screening Questions for the identified properties in the CHSR, no properties identified within the Study Area have been identified as having direct or indirect impacts during construction and operations. As a result, no further cultural heritage investigations are required.

4.7.2 Mitigation and Monitoring

No mitigation or monitoring is required for the Cultural Environment during construction and operation. The CHSR did not recommend the completion of a CHER or Heritage Impact Assessment.

4.8 Archaeology

4.8.1 Potential Effects

As described in **Section 3.6.2**, a Stage 1 AA was carried out for the Study Area, and was submitted to MTCS in accordance with Section 65 of the Ontario Heritage Act.

The results of the Stage 1 AA (see **Appendix B7**) indicate that, while the majority of the lands within the Study Area, including the Lakeshore West Rail Corridor ROW, appear to have been disturbed by past construction of the railway and commercial development, there are portions which still retain archaeological potential. This is based on the presence of historic homesteads, the proximity of historic roads and railway, other archaeological sites and certain physiographic features in proximity to the Study Area including Sheldon Creek. These areas require a Stage 2 AA, as shown in **Figure 3-20**.

4.8.2 Mitigation

For lands within the Study Area that contain archaeological potential and will be impacted by the Project, the following recommendations of the Stage 1 AA shall be followed:

1. A Stage 2 AA shall be conducted by a licensed consultant archaeologist in areas identified as having archaeological potential if they cannot be avoided by the development. The Stage 2 AA shall follow the requirements set out in the 2011 *Standards and Guidelines for Consultant Archaeologists* (MTCS, 2011).
2. Areas coloured in yellow in **Figure 3-20** will be subject to Stage 2 pedestrian survey in accordance with Section 2.1.1 Pedestrian Survey in the *Standards and Guidelines for Consultant Archaeologists* (2011). Land to be surveyed must be ploughed deep enough to provide total topsoil exposure, as well as weathered with either one heavy rainfall or several small ones. Pedestrian survey is to be completed at 5 m transects. When archaeological sources are found, survey transects are to be done at 1 m intervals over a minimum 20 m radius around the find to determine its nature. All formal types of artifacts and diagnostic categories are to be collected.
3. Areas coloured in green in **Figure 3-20** will be subject to Stage 2 test pit survey in accordance with Section 2.1.2 Test Pit Survey in the *Standards and Guidelines for Consultant Archaeologists* (2011). Test pits should be placed at a maximum of 5 m intervals, and done to within 1 m of all built structures. All test pits must be at least 30 cm in diameter and dug 5 cm into subsoil. All soil is to be screened through no greater than 6 mm mesh, and all artifacts are to be collected with their associated test pit. After investigation, all test pits must be backfilled to grade.
4. All other areas in **Figure 3-20** do not require Stage 2 assessment due to being deeply disturbed, permanently wet, or have been previously assessed and cleared of archaeological concerns.

Upon completion, the Stage 2 AA report will be submitted to MTCS for approval and entry into the Ontario Public Register of Archaeology Reports.

Should the proposed work extend beyond the Study Area, a Stage 1 AA shall be conducted to determine the archaeological potential and requirement for further Stage 2 AA work of any additional lands.

Any additional Archaeological Assessments (e.g., Stage 2, Stage 3 if recommended by the Stage 2) shall be completed as early as possible, and prior to the completion of detailed design. This work shall be done in accordance with the *MTCS's Standards and Guidelines for Consultant Archaeologists* (2011) to identify any archaeological resources that may be present.

It should be noted that in the event that additional Stage 1 and/or Stage 2 AA identifies potential for the discovery of an Indigenous archaeological site, Metrolinx shall engage appropriate Indigenous communities to review the findings of the report and determine next steps and monitoring requirements to be considered during further stages of archaeological assessment.

Should previously unknown or unassessed deeply buried archaeological resources be uncovered during construction activities, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act.* The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological field work, in compliance with Section 48 (1) of the *Ontario Heritage Act*. Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered.

4.9 Traffic and Transportation

4.9.1 Potential Effects

4.9.1.1 Construction

Road Network

The additional construction traffic accounts for a small percentage of the total anticipated 2022 southbound peak period traffic volumes (3% or less) as shown in **Table 4-6**. The proposed construction detour lanes have the same number of lanes as the existing configuration so the road capacity will not change and the few additional vehicles will not create a capacity issue on Burloak Drive. At the intersections, the additional construction traffic is expected to come from movements and there is sufficient capacity based on the current lane configurations and signal timing for the few additional construction related vehicles.

Table 4-6: Percentage of Construction Traffic added to 2022 Southbound Traffic on Burloak Drive

Intersection with Burloak Drive	Trips Entering or Exiting	Percentage of Construction Traffic in Total SB Through Traffic	
		AM	PM
Red Oak	Enter	1.15%	0.60%
Harvester	Enter	1.86%	0.70%
Prince William	Exit	1.74%	1.27%
Great Lakes	Exit	2.88%	2.90%

Notes: SB – southbound

Transit Network

City of Burlington

Burlington Transit will be largely unaffected by the construction. The two routes along Burloak Drive (#81 and #83) both operate north of Harvester Road and will not traverse the detour route.

Town of Oakville

Oakville Transit will be affected by the construction. The two (2) routes along Burloak Drive (#14 and #15) both operate south of Harvester Road with transit stops on both sides of Wyecroft Road, Superior Court, and Michigan Drive. The Route #15 transit stops on Wyecroft Road (transit stop 2322) and on Burloak Drive at Prince William Drive (transit stop 2325) may warrant relocation during construction.

Cycling, Pedestrian and Trail Network

During construction, there will be a temporary 3.5-metre-wide multi-use path constructed along the east side of the construction road detour. Pedestrians and cyclists who normally use the sidewalks on the west side of Burloak Drive will need to cross Burloak Drive at Harvester Road or Prince William Drive to access the multi-use path. However, they will be otherwise unaffected.

4.9.1.2 Operations

Road Network

A capacity and LOS analysis was conducted for the future (2022) traffic conditions with the widened 6-lane cross-section. The analysis was conducted at the same four intersections as the existing conditions analysis.

Burloak Drive and Highway 413/QEW Eastbound Off-Ramp / Red Oak Boulevard

This intersection was analyzed with the same lane arrangement and traffic signal timing plans that were used in the existing conditions analysis.

The V/C ratio for all the movements is less than 0.85, which indicates that significant delays and queues are not expected. The LOS at the approaches to the intersection for the AM southbound traffic and PM northbound traffic is predicted to increase from the LOS 'B' (reasonably free-flow) 2017 condition to LOS 'C' (stable flow) in 2022.

The remaining approaches do not experience any change. The measure of effectiveness information is provided in **Table 4-7**.

Table 4-7: Summary of Future (2022, 6-lane) Traffic Operations at the Intersection of Burloak Drive and Highway 403/QEW Eastbound Off-Ramp / Red Oak Boulevard

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	49	43	288	-	-	33	3	1635	-	-	626	3
	V/C Ratio	0.11	0.22	0.31			0.07		0.72			0.37	0.00
	Delay (sec)	31.3	9.7	7.1			0.3		21.9			16.3	0.0
	Q length 95th % (m)	18.5	13.5	16.8			0.0		125.6			59.4	0.0
	Movement LOS	C	A	A			A		C			B	A
	Approach LOS	B			A			C			B		
	Intersection LOS	B											
PM	Volume (vph)	85	78	245	-	-	104	3	1559	-	-	856	1
	V/C Ratio	0.21	0.25	0.29			0.30		0.73			0.54	0.0
	Delay (sec)	33.4	13.8	7.4			2.0		24.4			20.8	0.0
	Q length 95th % (m)	28.6	17.4	15.9			0.0		117.0			86.5	0.0
	Movement LOS	C	B	A			A		C			C	A
	Approach LOS	B			A			C			C		
	Intersection LOS	C											

Notes: LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.

Burloak Drive and Harvester Road / Wyecroft Road

This intersection was analyzed with the same lane arrangement and traffic signal timing plans that were used in the existing conditions analysis.

The intersection will operate at an acceptable LOS during both peak periods. However, there are two V/C ratios that exceed 1.00, the AM eastbound left turn movement and the PM southbound left movement. This means that drivers will experience some delay and may not be able to clear the intersection in one signal cycle. The measure of effectiveness information is provided below in **Table 4-8**.

Table 4-8: Summary of Future (2022, 6-lane) Traffic Operations at the Intersection of Burloak Drive and Harvester Road / Wyecroft Road

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	482	62	132	49	29	37	146	1079	628	214	1354	54
	V/C Ratio	**1.06**	0.08	0.30	0.19	0.11	0.15	0.61	0.60	0.66	0.69	0.72	0.08
	Delay (sec)	91.4	36.9	8.5	28.8	48.2	1.2	25.2.	26.9	5.2	25.1	284	0.2
	Q length 95th % (m)	#167.7	12.7	16.5	17.2	8.4	0.0	31.8	83.1	21.7	43.5	110.6	0.0
	Movement LOS	F	D	A	C	D	A	C	C	A	C	C	A
	Approach LOS	E			C			B			C		
	Intersection LOS	C											
PM	Volume (vph)	519	259	297	213	82	180	339	1353	278	144	1042	234
	V/C Ratio	0.93	0.33	0.62	0.75	0.32	0.64	**1.02**	0.74	0.38	0.77	0.73	0.39
	Delay (sec)	56.1	40.1	22.8	44.8	56.3	17.4	83.2	34.4	4.1	47.5	40.6	5.5
	Q length 95th % (m)	#168.5	43.6	60.3	59.4	19.4	17.4	83.2	34.4	4.1	47.6	40.6	5.5
	Movement LOS	E	D	C	D	E	B	F	C	A	D	D	A
	Approach LOS	D			D			D			D		
	Intersection LOS	D											

Notes: # indicates volume of 95th percentile traffic volume may not be served in one cycle. LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.

Burloak Drive and Prince William Drive / Superior Court

This intersection was analyzed with the widened 6-lane arrangement, which includes the addition of a dedicated southbound right-turn lane. Traffic signal timing plans were modified to accommodate the additional lane.

In the AM peak period, the intersection experiences a LOS 'F' which indicates that there are frequent delays and long queues at the intersection. In the PM peak period, the intersection is operating at an acceptable LOS.

In the AM peak period there is a high volume of northbound through vehicles which conflict with the high volume of southbound left-turning vehicles. Both these movements had V/C ratios approaching or meeting 1.00 in the existing conditions analysis. With the addition of the background traffic growth and known developments, it is not unexpected that these movements experience more delay in the future scenario. The measure of effectiveness information is provided below in **Table 4-9**.

Table 4-9: Summary of Future (2022, 6-lane) Traffic Operations at the Intersection of Burloak Drive and Prince William Drive / Superior Court

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	190	73	12	36	4	154	585	602	38	15	1202	185
	V/C Ratio	0.63	0.20		0.11	0.30		**1.38**	0.30	0.04	0.06	**1.23**	
	Delay (sec)	44.3	27.3		30.4	6.5		212.4	11.2	2.9	16.1	138.6	
	Q length 95th % (m)	64.4	27.8		14.6	16.1		#234.6	43.9	4.2	m3.5	#105.1	
	Movement LOS	D	C		C	A		F	B	A	B	F	
	Approach LOS	D			B			F			F		
	Intersection LOS	F											
PM	Volume (vph)	113	17	45	159	12	514	68	1401	221	41	748	50
	V/C Ratio	**1.40**	0.12		0.41	0.87		0.25	0.81	0.25	0.51	0.55	
	Delay (sec)	265.2	16.0		27.9	34.7		10.8	20.3	2.1	42.8	19.3	
	Q length 95th % (m)	#62.7	14.2		42.4	#127.2		11.0	127.4	9.4	#21.5	72.1	
	Movement LOS	F	B		C	C		B	C	A	D	B	
	Approach LOS	F			C			B			C		
	Intersection LOS	C											

Notes: # indicates volume of 95th percentile traffic volume may not be served in one cycle. (m) indicates volume for 95th percentile traffic queue is metered by upstream signal. LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.

Burloak Drive and Michigan Drive / Great Lakes Boulevard

This intersection was analyzed with the same lane arrangement and traffic signal timing plans that were used in the existing conditions analysis.

The intersection is operating at an acceptable LOS during both peak periods. In the PM peak period, the V/C ratio for the southbound right turn movement exceeds 0.85 and has a 95th percentile queue length that may not be served in one signal cycle. The measure of effectiveness information is provided below in **Table 4-10**.

Table 4-10: Summary of Future (2022, 6-lane) Traffic Operations at the Intersection of Burloak Drive and Michigan Drive / Great Lakes Boulevard

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	Volume (vph)	889	101	0	0	12	20	115	323	207	0	522	55
	V/C Ratio	0.83	0.15			0.24		0.37	0.38	0.25		0.36	
	Delay (sec)	40.6	20.1			30.0		18.5	15.0	1.6		20.0	
	Q length 95th % (m)	111.5	21.8			12.5		29.8	86.4	3.7		68.1	
	Movement LOS	D	C			C		B	B	A		C	
	Approach LOS	D			C			B			C		
	Intersection LOS	C											
PM	Volume (vph)	279	11	0	63	155	63	29	621	973	3	372	14
	V/C Ratio	0.71	0.02		0.29	0.74		0.06	0.68	0.94	0.01	0.22	
	Delay (sec)	48.6	19.7		34.8	46.5		12.1	20.9	27.2	11.7	12.2	
	Q length 95th % (m)	#43.7	4.9		21.5	58.0		7.4	128.0	#202.6	1.6	29.0	
	Movement LOS	D	B		C	D		B	C	C	B	B	
	Approach LOS	D			D			C			B		
	Intersection LOS	C											

Notes: # indicates volume of 95th percentile traffic volume may not be served in one cycle. LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.

Transit Network

Post-construction transit network operations can resume normally.

Cycling, Pedestrian and Trail Network

Following construction, there will be a 3 m-wide multi-use path on each side of Burloak Drive. Pedestrians and cyclists can return to their pre-construction travel routes. The multi-use path will be elevated and separated from the road as it crosses below the rail corridor, providing an extra level of safety for both pedestrians and cyclists. This may encourage more cyclists to use the road.

4.9.2 Mitigation and Monitoring

4.9.2.1 Construction

Road Network

Since the additional construction traffic accounts for a small percentage of the total anticipated 2022 southbound peak period traffic volumes (3% or less), and no capacity issues were identified on Burloak Drive or at intersections during construction, no mitigation measures are required during the construction period.

A Construction Traffic Management Plan shall be completed prior to commencing construction and will include consideration for construction staging to minimize traffic impacts. The Construction Traffic Management Plan will be developed in consultation with authorities having jurisdiction.

Transit Network

The Route #15 transit stops on Wyecroft Road (transit stop 2322) and on Burloak Drive at Prince William Drive (transit stop 2325) may be relocated south of the intersection. These relocations will be confirmed through consultation with affected municipalities during detailed design.

During construction, a temporary transit shuttle service will be provided in the Town of Oakville during the full road closures.

Cycling, Pedestrian and Trail Network

The Construction Traffic Management Plan shall outline the required construction signage that will alert cyclists and pedestrians to the detour and guide them to the temporary multi-use path.

4.9.2.2 Operations

Road Network

All traffic signals shall be optimized post-construction to accommodate the increase in traffic and additional lanes. In consultation with the municipalities, options to reduce high V/C ratios will be considered during detailed design.

Burloak Drive and Highway 413/QEW Eastbound Off-Ramp / Red Oak Boulevard

No additional mitigation measures are required at this intersection post-construction, since no capacity issues are expected.

Burloak Drive and Harvester Road / Wyecroft Road

No additional mitigation measures are required at this intersection post-construction, since no capacity issues are expected.

Burloak Drive and Prince William Drive / Superior Court

The addition of a second southbound left-turn lane would alleviate some of the delay experienced in the AM peak period by the estimated 585 vehicles making this turn at this intersection. With the additional lane and an adjustment in signal timing the intersection LOS during the AM peak period would improve from an LOS ‘F’ to a LOS ‘D’. There will still be some queueing and delay in the peak periods, but fewer vehicles will be affected. The measure of effectiveness information is provided in **Table 4-11**. This mitigation measure shall be discussed during future consultation with the Town of Oakville and the City of Burlington, and shall be further refined during detailed design.

Burloak Drive and Michigan Drive / Great Lakes Boulevard

No additional mitigation measures are required at this intersection post-construction, since no capacity issues are expected.

Transit Network

All displaced transit stops will be rebuilt to municipality standards following construction. No further mitigation measures are required for the transit network during operations.

Cycling, Pedestrian and Trail Network

No mitigation measures are required for the cycling, pedestrian and trail network during operations.

Table 4-11: Summary of Future (2022, 6-lane) Traffic Operations at the Intersection of Burloak Drive and Prince William Drive / Superior Court with Mitigation Measures Applied

Peak Hour	Measure of Effectiveness	Eastbound			Westbound			Southbound			Northbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM	**Volume (vph)**	190	73	12	36	4	154	585	602	38	15	1202	185
	V/C Ratio	0.59	0.18		0.14	0.36		**1.06**	0.34		0.06	0.99	0.29
	Delay (sec)	37.5	25.5		36.3	8.2		98.3	12.6		14.6	53.1	7.7
	Q length 95th % (m)	53.4	26.7		16.0	17.6		#112.2	49.6		m3.6	#197.0	m21.2
	Movement LOS	D	C		D	A		F	B		B	D	A
	Approach LOS	C			B			D			D		
	Intersection LOS	D											
PM	**Volume (vph)**	113	17	45	159	12	514	68	1401	221	41	748	50
	V/C Ratio	0.68	0.11		0.51	1.04		0.41	0.98		0.56	0.53	0.07
	Delay (sec)	40.7	16.4		36.7	72.7		50.5	40.4		54.0	22.1	0.2
	Q length 95th % (m)	#33.0	14.6		47.5	#147.7		13.8	#215.6		#24.4	76.4	0.0
	Movement LOS	D	B		D	E		D	D		D	C	A
	Approach LOS	C			E			D			C		
	Intersection LOS	D											

Notes: # indicates volume of 95th percentile traffic volume may not be served in one cycle. (m) indicates volume for 95th percentile traffic queue is metered by upstream signal. LT – Left Turn; TH – Through movement; RT – Right Turn; vph – Vehicles per hour; Q – Queue.

5. Climate Change Considerations

Climate change is defined as any significant change in long-term weather patterns. The term can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Global warming describes the recent rise in the average global temperature caused by increased concentrations of GHGs trapped in the atmosphere. Scientists have concluded that human activity is largely responsible for recently observed changes to our climate since GHGs are mainly caused by burning fossil fuels to produce energy.

The Government of Ontario has committed to reducing GHG emissions to 80% below 1990 levels by 2050 and has established two mid-term targets of 15% below 1990 levels by 2020 and 37% below 1990 levels by 2030.

In addition, the MOECC has developed a Climate Change Strategy (MOECC, 2016), which outlines the five (5) areas that Ontario will focus on in order to achieve the GHG reduction targets including:

1. A prosperous low-carbon economy with world-leading innovation, science and technology;
2. Government collaboration and leadership;
3. A resource-efficient, high-productivity society;
4. Reducing GHG emissions across key sectors; and
5. Adaptation and risk awareness.

As an agency of the Government of Ontario, Metrolinx has prioritized achieving progress towards sustainability (Metrolinx, 2014) which is in alignment with the MOECC Climate Change Strategy. Metrolinx has developed a Five Year Strategy 2015-2020 that outlines priorities and objectives that provide a framework to guide work in all parts of the organization as the implementation of the regional transportation plan is lead through an extensive program of tangible deliverables.

5.1 Effects on the Project from Climate Change

It is recognized that climate change is already underway and that extreme weather is affecting the GTHA and therefore may affect operation of the Project. Past risk and vulnerability studies and work done in the GTHA indicate that the following are some of the key climate change and severe weather effects that may need to be considered for the Project:

- Higher average temperatures and higher average minimum and maximum temperatures;
- Extreme/intense rain and flooding;
- Ice storms/freezing rain; and
- Lightning strikes and severe winds.

Projected changes in extreme weather conditions may be of particular concern in assessing the potential future climate change implications for the GO Expansion Program and enhanced resiliency shall be considered. Continuous changes in weather may require ongoing monitoring and adaptation.

Some of the potential future climate/weather effects that may warrant steps to reduce vulnerability and enhance resiliency and ongoing adaptive capacity include, but are not limited to:

- Exceedance of storm sewer/culvert and overland flow system capacities resulting in flooding;
- Scour and damage to or failure of culverts, bridges or embankment side slopes; and
- Ice accumulation affecting infrastructure and equipment.

Modifications to Project design/design solutions may be appropriate to reduce vulnerability to changes in some of the above-noted climate/weather parameters. Potential adaptations to deal with changing climate conditions may include the following:

- Extreme/intense rain and flooding:
  - Review/modify floodplain/storm frequency design criteria and implement Stormwater Management Report during construction/operation;
  - Manage stormwater runoff; and
  - Erosion and sediment control measures will be implemented during the construction phase of the Project to ensure stormwater runoff is not laden with sediment.

5.2 Effects of the Project on Climate Change

The Project is not anticipated to produce significant GHG emissions throughout the construction phase of the Project.

Key recommendations based on the American Public Transportation Association (APTA) Transit Sustainability Guidelines related to infrastructure and facilities may be further reviewed and considered if appropriate/feasible to include:

- Incorporate innovative sustainable construction practices;
- Set targets for construction and demolition debris diversion from landfill through on-site and off-site reuse and recycling; and
- Implement a sustainable procurement policy and/or supply chain policy based on comprehensive sustainability principles.

Investment in sustainability transportation is a key part of Ontario's 2015 Climate Strategy to address climate change and is anticipated to bring significant benefits including reduced GHG emissions and "carbon footprint". The Big Move (2008) Regional Transportation Plan for the GTHA highlights Metrolinx's GO Network Electrification as a key climate change mitigation measure that will contribute to Ontario's achievement of its GHG/carbon dioxide equivalent (CO_{2e}) emission reduction targets.

6. Consultation Process

6.1 Consultation Overview

In accordance with Section 8 of *O. Reg. 231/08*, this section summarizes the consultation activities carried out with members of the public, property owners, review agencies, Indigenous communities, and other stakeholders during the course of the Project, including a summary of feedback and comments received.

6.1.1 Approach to Consultation

Metrolinx offered a wide range of communication methods to reach all interested members of the public, property owners, review agencies, Indigenous communities, and other stakeholders to solicit comments and feedback on the Project:

- Project Website
- Elected Officials Briefings
- Mailings / Notifications
- Newspaper Advertisements
- Community Postings
- Social Media
- Stakeholder Meetings
- Public Meetings

6.1.2 Record of Consultation

Metrolinx maintained a record of all Project consultation undertaken during Pre-Planning activities and the TPAP. All Project correspondence and meeting summaries are documented in **Appendix C**. Comments received from the public have been redacted to protect personal information.

6.1.3 Identification of Interested Parties

During the Pre-Planning activities, a Project Mailing List (**Appendix C1**) was developed to ensure all stakeholders and interested parties receive notifications related to the Project.

Appropriate contacts at each review agency (i.e., federal, provincial, municipal, conservation authorities) were confirmed through outreach during Pre-Planning activities. Elected officials (i.e., City Council, Members of Parliament, Members of Provincial Parliament) with jurisdiction in the Study Area were confirmed through online resources. Indigenous communities were identified through consultation with MOECC, Ministry of Indigenous Relations and Reconciliation (MIRR), and Indigenous and Northern Affairs Canada (INAC). Property owners were identified through consultation and input from the City of Burlington and Town of Oakville planning staff.

The Project Mailing List was continually updated in response to Project feedback (e.g., requests to be added) and was utilized to inform stakeholders of Project milestones (e.g., Notice of Public Meetings, Notice of Commencement, etc.). All Project Notices are provided in **Appendix C2**.

6.1.4 Influence of Consultation on the Transit Project Assessment Process (TPAP)

Metrolinx undertakes introductory activities and consultation through Pre-Planning activities prior to the commencement of the TPAP.

The Public Meetings and focused stakeholder specific meetings provide an opportunity to speak directly with the Project Team. In this manner, the stakeholders are introduced to the Project and encouraged to provide comments on the assessment of existing environmental conditions and potential environmental effects within the Study Area. The feedback received over the course of the Project was used to inform the direction of the Project, as appropriate.

On October 24, 2017, Metrolinx provided the Draft EPR to the following regulatory agencies for an opportunity to review and comment:

- MOECC
- MNRF
- MTCS
- Halton Region
- City of Burlington
- Town of Oakville
- Conservation Halton

Comments received from the above agencies during the review period are provided in **Appendix C12**.

6.2 Pre-TPAP Planning Consultation

6.2.1 Public Consultation

Members of the public requesting general Project information were directed to the Project Website and notified of Public Meeting #1 held in March 2017. As the Project progressed, the Project Mailing List was maintained and updated accordingly. All public comments and issued responses during Pre-Planning activities are detailed in **Appendix C5**.

6.2.1.1 Public Meeting #1

6.2.1.1.1 Overview

Public Meeting #1 was held on March 30, 2017 from 6:30 PM to 8:30 PM at Queen Elizabeth Park Community and Cultural Centre in Oakville. The purpose of the meeting was to introduce the Project, provide details regarding the existing environmental conditions identified and preliminary studies conducted to date, and receive feedback from the public before issuing the TPAP Notice of Commencement. The meeting was held in an open house format where representatives from the Metrolinx Project Team, Consultant Team, and staff from the City of Burlington and Town of Oakville were available to answer questions and discuss Project details.

In total, over 60 individuals attended Public Meeting #1 and nine (9) Feedback Forms were received by the Project Team.

Consultation materials developed in association with Public Meeting #1 are included in **Appendix C3**.

6.2.1.1.2 Notification

Notification for Public Meeting #1 was accomplished through the following:

- Notification via Canada Post mail to the following recipients:
  - Three (3) property owners within 30 m of the Study Area during the week of March 6, 2017
  - 5,784 residences and businesses within 100 m of the Study Area during the week of March 6, 2017
- Notification via registered mail to Indigenous communities on March 13, 2017
- Notification via e-mail to all federal, provincial, and municipal agencies, and other interested stakeholders on March 7, 2017
- Posting on the Project Website (www.metrolinx.com/Burloak) on March 9, 2017
- Publication in the following newspapers:
  - Burlington Post – March 9, 2017
  - Oakville Beaver – March 9, 2017
- Posting at Burlington, Appleby, and Bronte GO Stations from March 15, 2017 to March 31, 2017
- Posting to Metrolinx and GO Transit Facebook pages and Twitter accounts (@Metrolinx, @MetrolinxFR, @GOTransit and @GOTransitFR) on March 15, 2017 and March 20, 2017.
- Publication in On the GO alerts (e-mailed or texted to subscribers) on March 15, 2017 and March 27, 2017
- Posting at seven (7) Burlington Public Library Locations and six (6) Oakville Public Library Locations on March 17, 2017 and March 20, 2017

6.2.1.1.3 Information Presented

The following information was presented at Public Meeting #1:

- The GO Lakeshore West Rail Corridor Service Plan;
- Overview of the Burloak Drive Grade Separation Project;
- Description of the TPAP;
- Preliminary design details of the Project, including construction of a 6-lane underpass, temporary detour of Burloak Drive and diversion of tracks, utility relocation, and potential property impacts;
- Description of the existing environmental conditions (including natural, socio-economic, and cultural environments); and
- Project Schedule and Next Steps.

Public Meeting #1 materials (i.e., display boards and flyover design) were posted on the Project Website following the meeting.

6.2.1.1.4 Summary of Comments Received

In total, over 60 individuals attended Public Meeting #1 (the sign-in sheet was signed by 58 individuals, while not every attendee chose to sign in). The Project Team received nine (9) Feedback Forms and 24 public comments via e-mail during the consultation period for Public Meeting #1, between March 30, 2017 and April 27, 2017. The Project Team also received two (2) stakeholder comments via e-mail from CTFSG and Union Gas. The Project Team did not receive any comments from any agencies (e.g., federal, provincial), Indigenous communities, or elected officials as a result of Public Meeting #1.

The feedback received was generally in support of the Project. Participants noted there will be improved safety and travel time associated with replacing the existing at-grade rail crossing with the proposed grade separation.

The sections below summarize the most common concerns noted by participants. Further detailed are provided in the Public Meeting #1 Summary Report (provided in **Appendix C3**).

Preliminary Design

One participant (i.e., Zeton Inc.) noted concerns with the height of the proposed bridge design and potential conflict with transporting oversize loads. For further details regarding consultation with this participant, please refer to **Table 6-4**.

Union Gas requested preliminary design drawings to review potential impacts to existing infrastructure on west side of Burloak Drive.

Traffic Impacts

Participants noted concerns with surrounding traffic during construction and operations, including pedestrian/cyclist limitations and increased detour/commercial traffic on residential streets.

Noise

Some participants indicated concerns with potential increase in construction and operational noise within the Study Area. CTFSG noted concern with potential noise impacts to call centre operations.

6.2.2 Agency Consultation

As part of the stakeholder consultation with review agencies, meetings were held during the Pre-Planning activities. The feedback received during the various meetings was used to inform the direction of the Project, as appropriate. Notable outreach prior to TPAP Notice of Commencement includes:

- Project Introduction Meetings and bi-weekly conference calls with City of Burlington and Town of Oakville (**Appendix C6**); and
- Five (5) Technical Advisory Committee (TAC) meetings with staff from City of Burlington and Town of Oakville (**Appendix C4**).

Table 6-1 summarizes outreach, correspondence, and meetings with review agencies (i.e., federal, provincial, municipal, and conservation authorities) undertaken prior to TPAP Notice of Commencement. Unless otherwise stated, all entries in the table are e-mail correspondence summaries. All relevant correspondence is also documented in **Appendix C6**.

6.2.2.1 Metrolinx Design Review Panel

The Metrolinx Design Review Panel (MDRP) includes internal and external members from a range of design professions, including:

- Architecture;
- Urban Design;
- Landscape Architecture;
- Engineering; and
- Ad hoc members, as expertise is required.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
City of Burlington Allan Magi, Executive Director Capital Works Department	July 11, 2016	• City staff advised that the appropriate contact for this Project is Scott Hamilton, Manager Design & Construction.
Town of Oakville Dan Cozzi, Director Engineering & Construction	July 11, 2016	• Town staff advised that the appropriate contact for this Project is Erik Zutis, Manager Infrastructure Planning.
Town of Oakville Project Introduction Meeting	July 19, 2016	• Metrolinx provided an overview of the Project. There was discussion regarding existing utilities and approved/ongoing projects in the area.
City of Burlington Project Introduction Meeting	July 28, 2016	• Metrolinx provided an overview of the Project and presented potential design alternatives (underpass and overpass). The City committed to providing information to Metrolinx related to property, existing utilities, and stormwater system.
Fisheries and Oceans Canada Emily Morton, Fisheries Protection Program	August 22, 2016	• AECOM requested information related to aquatic SAR presence within the unnamed tributary of Sheldon Creek.
	September 14, 2016	• DFO advised that there are no SAR at the intersection of Burloak Drive and the Lakeshore West Rail Corridor tracks or upstream.
Ministry of Natural Resources and Forestry Scientific Collection Permits Aurora	September 8, 2016	• AECOM submitted an application for a Fish Collection License to undertake fish community surveys at Sheldon Creek East Branch.
Ministry of Natural Resources and Forestry Aurora McAllister, Management Biologist	September 26, 2016	• AECOM requested reports and geographic information system (GIS) data confirming the presence of terrestrial and aquatic features, SAR records, regulated area and floodplain, water quality, and ELC vegetation communities within the Study Area.
	October 24, 2016	• MNRF confirmed that there are no records of SAR within or directly adjacent to the Study Area. MNRF advised that surveys by a qualified professional may be required in the future to confirm presence or absence of sensitive species or features.
Ministry of Tourism, Culture and Sport Laura Hatcher, Heritage Planner	September 26, 2016	• AECOM requested information related to screening for cultural heritage properties known to MTCS.
Ontario Heritage Trust Jeremy Collins, Acquisitions Co-ordinator	September 26, 2016	• AECOM requested information related to screening for cultural heritage properties known to OHT.
City of Burlington Thomas Douglas, Development Review & Heritage	September 26, 2016	• AECOM requested information related to screening for cultural heritage properties with status or significance known to the City of Burlington.
	September 27, 2016	• City staff confirmed there are no properties within the Study Area that are listed on the Municipal Register, designated under the *OHA*, protected by a municipal easement or of municipal heritage interest to the City.
Town of Oakville Carolyn Van Sligtenhorst, Heritage Planner	September 26, 2016	• AECOM requested information related to screening for cultural heritage properties with status or significance known to the Town of Oakville.
	September 28, 2016	• Town staff confirmed there are no properties within the Study Area that are listed on the Municipal Register, designated under the *OHA*, protected by a municipal easement or of municipal heritage interest to the Town.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
Technical Advisory Committee Meeting #1	September 26, 2016	• Metrolinx provided a Project overview and presented content from the 75% Feasibility Study.
Conservation Halton Leah Chishimba, Environmental Planner	September 27, 2016	• AECOM requested reports and GIS data confirming the presence of terrestrial and aquatic features, SAR records, regulated area and floodplain, water quality, and ELC vegetation communities within the Study Area.
	January 11, 2017	• CH advised that staff is co-ordinating their response.
Town of Oakville Dan Cozzi, Director Engineering & Construction	September 27, 2016	• Town staff provided high level cost estimate for a similar 4-lane underpass undertaking following TAC Meeting #1.
	October 17, 2016	• Metrolinx provided AECOM's cost estimate for the Project for Town staff to review and compare.
	October 19, 2016	• Metrolinx provided background information to explain the difference in cost estimates.
Ontario Heritage Trust Jeremy Collins, Acquisitions Co-ordinator	October 5, 2016	• OHT noted there are no properties within or abutting the Study Area that are protected by the OHT including provincial plaques. Encouraged consultation with MTCS to confirm if there are any other cultural heritage interests affecting the Project.
Ministry of Natural Resources and Forestry Karen Golby, Resources Clerk	October 7, 2016	• MNRF requested Universal Transverse Mercator (UTM) co-ordinates for Sheldon Creek East Branch prior to issuing the requested Fish Collection License.
City of Burlington Scott Hamilton, Manager Design & Construction	October 17, 2016	• City staff provided preliminary comments on the 75% Feasibility Study.
City of Burlington Scott Hamilton, Manager Design & Construction	October 21, 2016	• City staff provided Halton Region geotechnical information.
Town of Oakville Erik Zutis, Manager Infrastructure Planning	October 24, 2016	• Town staff provided preliminary comments on the 75% Feasibility Study.
City of Burlington Scott Hamilton, Manager Design & Construction **Town of Oakville** Erik Zutis, Manager Infrastructure Planning	October 28, 2016	• AECOM asked City staff and Town staff to review their respective platform cross-section requirements and provide a common set of requirements to be used for the Project.
	January 18, 2017	• AECOM requested a common set of requirements to be used for the Project.
Halton Region Jonathan Sealey, Traffic Operations & Safety Co-ordinator	October 31, 2016	• AECOM requested traffic data relating to the intersections at Burloak Drive and Highway 403 eastbound off-ramp (Red Oak Boulevard), and Burloak Drive and Harvester Road / Wyecroft Road.
	November 3, 2016	• Region staff provided TMC counts and ATR summary for the two stations nearest Burloak Drive (near Harvester Road and the QEW) and that updated data could be provided at the end of November 2016.
	November 14, 2016	• AECOM requested additional data relating to signal timing, growth forecast, future road upgrades, and bus detours. AECOM noted ongoing construction at the intersection of Burloak Drive and QEW and inquired if the construction was short-term or long-term.
	November 24, 2016	• Region staff responded to AECOM's data request.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
	January 25, 2017	• AECOM requested recent cyclist counts on Burloak Drive between Harvester Road and the existing rail crossing.
	February 16, 2017	• Region staff advised that cyclists were not counted during 2016 ATR.
City of Burlington Steve Vrakela, Transportation Services Department	October 31, 2016	• AECOM requested traffic data relating to the intersection of Burloak Drive and Superior Court (Prince William Drive).
	February 16, 2017	• City staff provided signal timing data and advised cycling counts and growth rates are not currently available.
Ministry of Natural Resources and Forestry Karen Golby, Resources Clerk	November 1, 2016	• MNRF provided Fish Collection License.
Town of Oakville Dan Cozzi, Director Engineering & Construction	November 14, 2016	• Metrolinx provided an overview of the TPAP process. Town staff confirmed no further review of process details required.
Town of Oakville Jill Stephen, Senior Manager Transportation	November 15, 2016	• Town staff provided a Traffic Impact Study for a recent development close to the Study Area.
Ministry of Transportation Graham Routledge, Highway Corridor Management Section	November 16, 2016	• MTO confirmed appropriate contact. MTO noted permits may be required and requested circulations to provide feedback and input regarding their requirements.
Halton Region Graham Procter, Planning Services	November 21, 2016	• Region staff requested information regarding specific improvements to the GO Transit Lakeshore West Rail Corridor.
Town of Oakville Erik Zutis, Manager Infrastructure Planning	November 28, 2016	• Town staff provided Oakville's Draft 2017-2026 Capital Forecast for transportation and water resources. Staff noted that this forecast is draft and has not been endorsed by Council.
Town of Oakville Dan Cozzi, Director Engineering & Construction	December 6, 2016	• Town staff provided comments regarding the future electrification of the Lakeshore West Rail Corridor, noting concern with providing electrification prior to completion of the Project.
	January 11, 2017	• Metrolinx responded to the Town explaining the process in which Metrolinx determines the need for infrastructure improvements.
City of Burlington Scott Hamilton, Manager Design & Construction	December 9, 2016	• Metrolinx provided City staff with a copy of the TPAP Guide and *O. Reg. 231/08*.
Oakville Transit Joanne Phoenix, Manager Planning and Accessible Services	December 12, 2016	• Town staff provided a cost-sharing proposal to maintain adequate public transit service (Routes #14 and #15) during construction.
	December 12, 2016	• AECOM inquired regarding details related to the Town's cost-sharing proposal.
	December 13, 2016	• Oakville Transit advised that the requested information would be provided in January 2017.
	February 8, 2017	• Metrolinx advised transportation staff to discuss financial impacts to Oakville Transit with Town Project staff.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
Technical Advisory Committee Meeting #2	December 16, 2016	• Metrolinx provided a Project schedule and an update on the development of the Feasibility Study. The group discussed the design alternatives being evaluated as part of the Feasibility Study.
Ministry of Tourism, Culture and Sport Malcom Horne, Archaeology Programs Unit	January 11, 2017	• AECOM requested MTCS concurrence on recommendations to undertake test pitting as part of Stage 2 archaeological investigations.
	January 12, 2017	• MTCS noted that ploughing and pedestrian survey is the preferred method of Stage 2 archaeological investigations in this area and did not support the recommendation for test pitting.
Town of Oakville Dan Cozzi, Director Engineering & Construction	January 13, 2017	• Town staff provided comments following TAC Meeting #2.
City of Burlington Scott Hamilton, Manager Design & Construction	January 19, 2017	• City staff provided comments on the Draft 100% Feasibility Study.
Conservation Halton Leah Chishimba, Environmental Planner	February 13, 2017	• CH provided comments regarding presence of natural areas, SAR records, critical habitat evaluated wetlands, and ELC vegetation communities.
Ministry of the Environment and Climate Change Gavin Battarino, Special Project Officer	February 15, 2017	• Metrolinx sent a formal request for a list of Indigenous communities that may have an interest in the Project.
	February 22, 2017	• MOECC provided a list with three (3) Indigenous communities to consult with: Haudenosaunee Confederacy Chiefs Council, Mississaugas of the New Credit First Nation, and Six Nations of the Grand River Territory.
City of Burlington Scott Hamilton, Manager Design & Construction **Town of Oakville** Erik Zutis, Manager Infrastructure Planning	February 16, 2017	• Metrolinx provided Final Feasibility Study to City staff and Town staff for information and records.
City of Burlington Scott Hamilton, Manager Design & Construction **Town of Oakville** Erik Zutis, Manager Infrastructure Planning	February 22, 2017	• City staff and Town staff confirmed support for the 6-lane road platform cross-section.
Technical Advisory Committee Meeting #3	February 24, 2017	• Metrolinx informed City staff and Town staff that it will be proceeding with a conventional underpass structure (Alternative 1) with a 6-lane road platform as a result of the Feasibility Study and feedback from municipal stakeholders. Metrolinx will investigate addition of a push box structure at the request of City of Burlington and Town of Oakville. Metrolinx also provided details related to upcoming Public Meeting #1.
Ministry of Transportation Leslie Currie, Aboriginal Liaison Officer	February 27, 2017	• MTO concurred with MOECC's identification of Indigenous communities.
City of Burlington Kaylan Edgcumbe, Manager Transportation Planning and Parking	March 7, 2017	• City staff requested to be added to Project Mailing List.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
Ministry of Indigenous Relations and Reconciliation Lise Chabot, Acting Manager Ministry Partnerships Unit	March 9, 2017	• Metrolinx sent a formal request for a list of Indigenous communities that may have an interest in the Project.
Indigenous and Northern Affairs Canada Allison Berman, Regional Subject Expert	March 9, 2017	• Metrolinx sent a formal request for a list of Indigenous communities that may have an interest in the Project.
Canadian Environmental Assessment Agency Anjala Puvananathan, Regional Director	March 13, 2017	• CEAA advised Metrolinx to review the *Regulations Designated Physical Activities (CEAA, 2012)* and remove CEAA from the Project Mailing List if the Project is not applicable.
Conservation Halton Leah Chishimba, Environmental Planner	March 24, 2017	• AECOM provided a letter detailing the findings of the Stage 1 AA and details regarding the upcoming Stage 2 AA.
City of Burlington Florin Patrau, Traffic Technologist	April 28, 2017	• City staff noted only one (1) Oversize Load application was received for Burloak Drive in 2016.
City of Burlington Scott Hamilton, Manager Design & Construction	May 29, 2017	• AECOM requested information related to the City's stormwater sewer infrastructure.
City of Burlington Scott Hamilton, Manager Design & Construction	June 1, 2017	• City staff provided contact regarding historic storm sewer information.
Technical Advisory Committee Meeting #4	June 20, 2017	• City of Burlington and Town of Oakville comments on the 30% preliminary design drawings were discussed. Metrolinx noted the feasibility of a push box structure is still being evaluated. Metrolinx provided an updated schedule with TPAP milestones.
City of Burlington Robert Peachey, Manager Parks & Open Space	July 17, 2017	• City staff committed to revising the existing Permission to Enter (PTE) agreement to extend access to January 2018 and advised co-ordination with Sherwood Forest Park construction will be required.
Ministry of Tourism, Culture and Sport Ian Hember, Archaeology Review Officer	July 28, 2017	• MTCS entered the Stage 1 AA Report into the Ontario Public Register of Archaeological Reports.
Ministry of the Environment and Climate Change Solange Desautels, Environmental Approvals Branch	September 20, 2017	• Metrolinx provided an overview of the Project and requested that a Project Officer be assigned to the TPAP.
Ministry of the Environment and Climate Change Callee Robinson, Project Evaluator Anne Cameron, Burloak Project Officer	October 12, 2017	• Metrolinx provided an overview of the Project and TPAP milestones.
	October 13, 2017	• MOECC confirmed Project Officer for the TPAP.
	October 24, 2017	• Metrolinx provided MOECC with the Draft EPR and noted that comments will be accepted during the agency comment period from October 25, 2017 to November 13, 2017.
	November 14, 2017	• MOECC provided comments on the Draft EPR.
Ministry of Natural Resources and Forestry Steven Strong, Senior District Planner	October 16, 2017	• Metrolinx provided an overview of the Project and TPAP milestones.
	October 24, 2017	• Metrolinx provided MNRF with the Draft EPR and noted that comments will be accepted during the agency comment period from October 25, 2017 to November 13, 2017.
	November 15, 2017	• MNRF noted there are no major concerns with the Project after reviewing the Draft EPR.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
Ministry of Tourism, Culture and Sport Karla Barboza, (A) Heritage Team Lead Laura Hatcher, Heritage Planner	October 16, 2017	• Metrolinx provided an overview of the Project and TPAP milestones.
	October 24, 2017	• Metrolinx provided MTCS with the Draft EPR and noted that comments will be accepted during the agency comment period from October 25, 2017 to November 13, 2017.
Ministry of Transportation Greg Malczewski, Transit Infrastructure Policy	October 16, 2017	• Metrolinx provided an overview of the Project and TPAP milestones.
Halton Region Adam Huyke, Intermediate Planner Alicia Jakaitis, Project Manager II Karyn Poad, Senior Project Manager Transportation	October 16, 2017	• Metrolinx provided an overview of the Project and TPAP milestones.
	October 20, 2017	• Halton Region requested additional staff be included on the distribution of the Draft EPR.
	October 23, 2017	• Metrolinx confirmed additions to the distribution list.
	October 24, 2017	• Metrolinx provided Halton Region with the Draft EPR and noted that comments will be accepted during the agency comment period from October 25, 2017 to November 13, 2017.
	November 13, 2017	• Halton Region provided comments on the Draft EPR.
City of Burlington Scott Hamilton, Manager Design & Construction **Town of Oakville** Dan Cozzi, Director Engineering & Construction	October 16, 2017	• Metrolinx provided an overview of the Project and TPAP milestones. Metrolinx advised that this information is also being distributed to review agencies.
	October 24, 2017	• Metrolinx provided the Draft EPR to the City and the Town and noted that comments will be accepted during the agency comment period from October 25, 2017 to November 13, 2017.
	October 25, 2017	• Metrolinx advised to circulate the Draft EPR to the appropriate City and Town departments for comment.
	November 12, 2017	• City of Burlington provided comments on the Draft EPR.
	November 12, 2017	• Town of Oakville provided comments on the Draft EPR.
Conservation Halton Leah Chishimba, Environmental Planner Heather Dearlove, Environmental Planner	October 24, 2017	• Metrolinx provided Conservation Halton with the Draft EPR and noted that comments will be accepted during the agency comment period from October 25, 2017 to November 13, 2017.
	November 6, 2017	• Conservation Halton provided an update regarding the appropriate contact for the Project.
	November 13, 2017	• Conservation Halton provided comments on the Draft EPR.
Ministry of Tourism, Culture and Sport Laura Hatcher, Heritage Planner	November 10, 2017	• MTCS provided comments on the Draft EPR.
Technical Advisory Committee Meeting #5	November 13, 2017	• City of Burlington and Town of Oakville comments on the Draft EPR and 30% preliminary design drawings were discussed.
Halton-Hamilton Source Protection Region Diane L. Bloomfield, Manager Source Water Protection	November 21, 2017	• Halton-Hamilton Source Water Protection Region provided a formal letter with comments on the draft characterization of source protection considerations. Halton-Hamilton Source Water Protection Region noted that it is unlikely that activities associated with construction of the Project would result in adverse effects on the municipal water source.
	November 22, 2017	• Notice of Commencement and Public Meeting #2 was distributed to contacts on the mailing list.

Table 6-1: Summary of Pre-TPAP Consultation with Review Agencies

Agency	Date	Summary
Ministry of the Environment and Climate Change Marinha Antunes, Air Quality Analyst	November 22, 2017	• Responded to the Notice of Commencement requesting removal from the distribution list.
Canadian Transportation Agency Carole Girard, Executive Director Internal Services	November 22, 2017	• Responded to the Notice of Commencement advising of the appropriate CTA contact for future distributions.
Conservation Halton Cassandra Connolly, Regulations Officer	November 22, 2017	• Responded to the Notice of Commencement noting distribution to other Conservation Halton staff.

The purpose of the MDRP is to integrate design excellence into Project evaluation, ensure appropriate design guidelines are in place and establish a design review process including a design review panel with a high standard of professional expertise.

Designs for key elements of the Project, including significant public facing retaining walls and corridor facing retaining walls that may be notable from a public realm perspective, shall be reviewed as required by the MDRP during detailed design.

6.2.3 Indigenous Community Consultation

On February 15, 2017, a formal request was sent to the MOECC's Environmental Approvals Branch for a list of Indigenous communities that may have an interest in the Project per subsection 7(4) of *O. Reg. 231/08*. MOECC responded on February 22, 2017 providing a list of the following Indigenous communities:

- Haudenosaunee Confederacy Chiefs Council
- Mississaugas of the New Credit First Nation
- Six Nations of the Grand River Territory

On March 9, 2017, a formal request was sent to MIRR and INAC seeking assistance in identifying specific Indigenous communities with which to consult regarding the Project. The Indigenous contact list was confirmed by using the INAC Aboriginal and Treaty Rights Information System (ATRIS). This correspondence is included in **Appendix C7**.

The three (3) identified Indigenous communities were contacted for an opportunity to participate and provide comments on the Project during Pre-Planning activities, prior to Notice of Commencement. On March 13, 2017, each community was provided with a formal letter describing the Project. This correspondence also included an invitation to Public Meeting #1 and provided a copy of the Stage 1 AA Report completed for the Project (Final Draft dated February 3, 2017) for review. Metrolinx followed up with each of these communities via phone call shortly after the letters were sent.

Table 6-2 provides a summary of consultation with Indigenous communities undertaken prior to TPAP Notice of Commencement. All relevant correspondence is also documented in **Appendix C7**.

Table 6-2: Summary of Pre-TPAP Consultation with Indigenous Communities

Indigenous Community	Date	Summary
Six Nations of the Grand River Territory Chief Ava Hill	September 12, 2016	• The purpose of this meeting was to provide the Six Nations of the Grand River Territory with an overview of various Metrolinx projects and provide an opportunity to address any preliminary concerns and gain input. In addition an overview was provided on the TPAP process including Pre-Planning activities, TPAP consultation activities and project milestones that could be expected. • An overview of projects was provided and included the GO Rail Network Electrification, Burloak Drive Grade Separation works, Bronte and Highway 407 Park and Ride, Hamilton Light Rail Transit (LRT), Hurontario LRT, the Niagara Falls GO Rail Extension and the new freight rail corridor. The Six Nations of the Grand River Territory noted that they would appreciate ongoing consultation and communication.
	March 13, 2017	• Metrolinx provided a formal letter encouraging community participation throughout the Project. The letter described the Project, provided an invitation to Public Meeting #1, and requested feedback on the Stage 1 AA Report (Final Draft dated February 3, 2017). • Note that Six Nations of the Grand River Territory did not respond to this Notice.

Table 6-2: Summary of Pre-TPAP Consultation with Indigenous Communities

Indigenous Community	Date	Summary
	November 22, 2017	• Metrolinx provided a formal letter regarding Notice of Commencement and Public Meeting #2. Metrolinx noted the Stage 2 AA is underway and an electronic copy of the draft report will be provided for review in early 2018. • Note that Six Nations of the Grand River Territory did not respond to this Notice.
Mississaugas of the New Credit First Nation Chief Stacey LaForme Megan DeVries, Archaeological Coordinator	September 19, 2016	• The purpose of this meeting was to provide Mississaugas of the New Credit First Nation with an overview of various Metrolinx projects, provide an opportunity to address any preliminary concerns and to gain input. An overview was provided on the TPAP process including Pre-Planning activities, TPAP consultation activities and milestones that could be expected for projects. • An overview of projects was provided and included the GO Network Electrification, Hamilton LRT, Hurontario LRT, Barrie Rail Corridor Expansion, Bloomington GO Station, Burloak Drive Grade Separation works, Bronte and Highway 407 Park and Ride, Lakeshore East Rail Corridor Expansion (Guildwood to Pickering), the Union Station Rail Corridor East Enhancements, Stouffville Corridor Grade Separations works, the Niagara Falls GO Rail Extension and the new freight rail corridor. Mississaugas of the New Credit First Nation noted that they would appreciate ongoing consultation and communication.
	March 13, 2017	• Metrolinx provided a formal letter encouraging community participation throughout the Project. The letter described the Project, provided an invitation to Public Meeting #1, and requested feedback on the Stage 1 AA Report (Final Draft dated February 3, 2017). • Note that Mississaugas of the New Credit First Nation did not respond to this Notice.
	May 11, 2017	• Metrolinx followed up with Mississaugas of the New Credit First Nation via e-mail regarding previous interest in developing a contract for field participation during upcoming Stage 2 archaeological investigations.
	May 15, 2017	• Mississaugas of the New Credit First Nation provided a contract for the participation of the Field Liaison Representatives during upcoming environmental and archaeological field work for the Project.
	May 18, 2017	• Metrolinx noted that Indigenous field participation is generally limited to during Stage 3 and Stage 4 archaeological investigations per MTCS guidelines. Metrolinx advised that a copy of the Stage 2 AA Report shall be provided to Mississaugas of the New Credit First Nation for review and comment once complete. MNFCN shall be notified should Stage 3 and/or Stage 4 archaeological investigations be required during detailed design and arrangements for field participation would be made at that time.
	November 22, 2017	• Metrolinx provided formal letters regarding Notice of Commencement and Public Meeting #2. Metrolinx noted the Stage 2 AA is underway and an electronic copy of the draft report will be provided for review in early 2018. • Note that Mississaugas of the New Credit First Nation did not respond to this Notice.
Haudenosaunee Confederacy Chiefs Council Hohahes Leroy Hill, Secretary	March 13, 2017	• Metrolinx provided a formal letter encouraging community participation throughout the Project. The letter described the Project, provided an invitation to Public Meeting #1, and requested feedback on the Stage 1 AA Report (Final Draft dated February 3, 2017). • Note that Haudenosaunee Confederacy Chiefs Council did not respond to this Notice.
	November 22, 2017	• Metrolinx provided a formal letter regarding Notice of Commencement and Public Meeting #2. Metrolinx noted the Stage 2 AA is underway and an electronic copy of the draft report will be provided for review in early 2018. • Note that Haudenosaunee Confederacy Chiefs Council did not respond to this Notice.
Métis Nation of Ontario Aly N. Alibhai, Director of Lands, Resources and Consultation	November 22, 2017	• Metrolinx provided a formal letter regarding Notice of Commencement and Public Meeting #2. Metrolinx noted the Stage 2 AA is underway and an electronic copy of the draft report will be provided for review in early 2018. • Note that Métis Nation of Ontario did not respond to this Notice.

6.2.4 Other Stakeholder Consultation

6.2.4.1 Elected Officials and Community Organizations

Consultation with elected officials and community organizations was undertaken during Pre-Planning activities through e-mail/written correspondence, conference calls, and stakeholder meetings.

Table 6-3 provides a summary of consultation with elected officials and community organizations undertaken prior to TPAP Notice of Commencement. All relevant correspondence and meeting summaries are also documented in **Appendix C8**.

Table 6-3: Summary of Pre-TPAP Consultation with Elected Officials and Community Organizations

Stakeholder	Date	Summary
Burlington City Council Mayor Goldring Councillor Sharman (Ward 5)	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the Mayor and Councillor to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to the City of Burlington.
Oakville Town Council Mayor Burton Regional Councillor O'Meara (Ward 1) Councillor Robinson (Ward 1)	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the Mayor and Councillor to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to the Town of Oakville.
MP Burlington Karina Gould	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the MP to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to the Burlington riding.
MP Oakville John Oliver	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the MP to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to the Oakville riding.
MPP Burlington Eleanor McMahon	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the MPP to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to the Burlington riding.
MPP Oakville Kevin Flynn	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the MPP to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to the Oakville riding.
Bronte Village Residents Association	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the MPP to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to Bronte Village.
Bronte Village BIA	February 13, 2017	• Metrolinx provided an outreach e-mail offering to meet with the MPP to discuss the Project and its integration with Metrolinx's 10-year plan for improved GO Transit service as it relates to Bronte Village BIA.
MP Oakville John Oliver	February 27, 2017	• A briefing was held by phone and MP Oliver indicated support of the Project.
Burlington City Council Councillor Sharman (Ward 5)	March 1, 2017	• A briefing was held in person with the Councillor and other City of Burlington staff. Metrolinx presented a slide deck which included Project background information, preliminary design details of the proposed underpass, and a description of the TPAP. The City indicated interest in further discussion related to bike lanes.
MPP Burlington Eleanor McMahon	March 2, 2017	• A briefing was held by phone with the Executive Assistant to MPP McMahon. Metrolinx provided a slide deck in advance of the discussion which included Project background information, preliminary design details of the proposed underpass, and a description of the TPAP. MPP McMahon's Executive Assistant indicated no issues related to the Project.

Table 6-3: Summary of Pre-TPAP Consultation with Elected Officials and Community Organizations

Stakeholder	Date	Summary
Burlington City Council Office of Councillor Dennison (Ward 4)	March 8, 2017	• Councillor's office requested to be added to the Project Mailing List.
Oakville Town Council Mayor Burton Regional Councillor O'Meara (Ward 1)	March 22, 2017	• A briefing was held in person where Metrolinx provided details relating to the TPAP and the Project design and construction schedule.
MPP Oakville Office of Minister Kevin Flynn	March 28, 2017	• Phone briefing by upper management to provide a broad overview of work to occur in the area; Burloak was noted.
MP Burlington Karina Gould	March 29, 2017	• Phone briefing by upper management to provide a broad overview of work to occur in the area; Burloak was noted.
MP Oakville North-Burlington Pam Damoff	May 25, 2017	• Briefing by upper management to provide a broad overview of work to occur in the area; Burloak was noted.
MPP Burlington Eleanor McMahon **Burlington City Council** Mayor Goldring	August 11, 2017	• Briefing by upper management to provide a broad overview of work to occur in the area; Burloak was noted.
MPP Burlington Eleanor McMahon	September 7, 2017	• Briefing by upper management to provide a broad overview of work to occur in the area; Burloak was noted.

6.2.4.2 Other Stakeholders

Consultation with other stakeholders (e.g., utility companies, surrounding businesses, interested parties) was undertaken during Pre-Planning activities through e-mail/written correspondence and stakeholder meetings.

Table 6-4 provides a summary of all other stakeholder consultation (i.e., stakeholder consultation not captured in previous sections) undertaken prior to TPAP Notice of Commencement. All relevant correspondence and meeting summaries are also documented in **Appendix C8**.

Table 6-4: Summary of Pre-TPAP Consultation with Other Stakeholders

Stakeholder	Date	Summary
Trans-Northern Pipeline Inc.	September 9, 2016	• TNPI indicated preference for the underpass design. TNPI requested Metrolinx cover the cost of installing a steel casing around the pipeline to the edge of the Burloak Drive ROW if the overpass design is pursued.
	April 17, 2017	• AECOM advised that the preferred alternative as a result of the Feasibility Study will be an underpass structure with a 6-lane road configuration. AECOM asked TNPI to advise regarding design reviews and permits. AECOM noted subsurface utility investigations will be conducted to confirm the pipeline depth, and asked TNPI to advise if there are any objections to undertaking these investigations.
	August 1, 2017	• Metrolinx summarized discussion regarding minimum clearance requirements and asked TNPI to confirm that a vertical clearance of 1.5 m is acceptable.
	August 1, 2017	• TNPI confirmed a 5% slope that results in 1.5 m coverage atop the pipeline is acceptable despite the 1.2 m standard.
Colliers International	November 16, 2016	• Colliers International requested details regarding the TPAP and associated schedule.
	November 29, 2016	• Metrolinx responded detailing the purpose of the Project, TPAP schedule, and provided a link to the Project Website.

Table 6-4: Summary of Pre-TPAP Consultation with Other Stakeholders

Stakeholder	Date	Summary
Canadian Tire Financial Services Group	March 9, 2017	• Metrolinx provided Feasibility Study in response to a phone request from CTFSG. Metrolinx also provided staff contacts regarding property impacts. Metrolinx advised that noise studies will be completed later in 2017 as part of the TPAP.
	March 13, 2017	• Formal notification request for upcoming meetings and Project milestones.
	March 15, 2017	• Metrolinx confirmed addition to the Project Mailing List.
	April 11, 2017	• CTFSG provided a letter noting concerns with construction noise and potential impact to call centre operations.
	May 5, 2017	• Metrolinx met with CTFSG to discuss concerns, such as parking, access, traffic, property impacts, construction noise, and utility impacts. Metrolinx noted the design is in early stages and will communicate potential effects prior to construction to identify appropriate mitigation. Metrolinx noted a small portion of property may be affected to accommodate the temporary road detour during construction.
	May 12, 2017	• Metrolinx followed up with CTFSG following the meeting held May 5, 2017 and attached Project overview information.
Union Gas	March 16, 2017	• In response to Notice of Public Meeting #1, Union Gas noted an existing pipeline along the west side of Burloak Drive may be impacted by the Project and requested to review preliminary drawings.
	March 16, 2017	• Metrolinx noted receipt of the comment and will be in touch with any additional information.
Halton District School Board	March 30, 2017	• Requested to be added to Project Mailing List.
Zeton Pilot Plant Technology Inc.	April 17, 2017	• Metrolinx thanked Zeton for attending Public Meeting #1 and offered to schedule a meeting to further discuss concerns.
	April 17, 2017	• Zeton requested a plan and profile drawing of the bridge design to review against their commercial trailers.
	April 20, 2017	• Metrolinx provided a PDF of the plan and profile drawing.
	June 12, 2017	• Metrolinx provided a summary of meeting held on June 2, 2017. In the meeting, Zeton noted concerns regarding cargo height constraints under the bridge due to steep grade. Once Zeton provides drawings of truck dimensions, AECOM will determine worst case scenario and allowable tolerance with the current slopes and clearance.
	July 12, 2017	• Metrolinx reconnected with Zeton noting road profile drawings will be provided for their review. Metrolinx asked Zeton to sign the Data License Agreement prior to releasing the drawings.
	July 18, 2017	• Zeton returned signed copy of the Data License Agreement to Metrolinx.
	July 27, 2017	• Metrolinx provided the AutoCAD road profile drawings to Zeton.
	August 3, 2017	• Zeton indicated that their truck height exceeds the maximum underpass height in both directions.
	June 2, 2017	• Metrolinx met with Zeton to discuss the Project and Zeton's concerns regarding the clearance under the proposed bridge structure for their oversize trucks.
	September 25, 2017	• Metrolinx held a conference call to discuss Zeton's request to increase clearance to 6.6 m to accommodate oversize trucks. Metrolinx explained that the extra clearance could not be accommodated in the underpass design based on site constraints (e.g., pipeline to the south, slopes required by municipalities). Zeton asked if building a private at-grade crossing is possible. Metrolinx advised that they will work with Zeton to explore alternative solutions, where possible.

Table 6-4: Summary of Pre-TPAP Consultation with Other Stakeholders

Stakeholder	Date	Summary
Emshih Developments Inc.	April 19, 2017	• Emshih noted concerns regarding construction access during temporary road detour and subsequent impacts to business. Emshih also noted concerns regarding reduced visibility and subsequent impacts to business during operations.
	May 1, 2017	• Metrolinx noted these potential effects will be evaluated during the TPAP and documented in the EPR. Metrolinx will be developing construction management plans prior to construction to address traffic and nuisance effects for local businesses.
	July 12, 2017	• Emshih noted interest in being involved in the planning process for the Project to mitigate and reduce effects to 800 Burloak Drive.
	September 19, 2017	• Metrolinx noted that environmental studies are underway and will be in touch if additional information is required. Metrolinx confirmed addition to stakeholder contact list.
RioCan	August 8, 2017	• RioCan provided a formal letter noting concerns with the temporary Burloak Drive road detour and property access implications during operations.
Dymon Group of Companies	October 11, 2017	• Dymon Group of Companies noted their activity on lands at 845 Burloak Drive.
	October 19, 2017	• Metrolinx held a meeting with Dymon Group of Companies to discuss potential property impacts associated with the Project.

6.3 TPAP Consultation

6.3.1 Notice of Commencement

The Notice of Commencement (combined with notification for Public Meeting #2) was issued to the public on November 23, 2017 through the Project Website, and was published in the *Burlington Post* and *Oakville Beaver* on November 23, 2017 and November 30, 2017. A copy of the Notice of Commencement is provided in **Appendix C2**.

To further reach interested residents and local GO transit users, the Notice of Commencement and Public Meeting #2 was posted at the Bronte, Appleby and Burlington GO Stations from November 23, 2017 until December 13, 2017.

Stakeholders (government review agencies, Indigenous communities and property owners on the Project Mailing List) and attendees of Public Meeting #1 were sent notification of the Notice of Commencement via e-mail, where available.

6.3.2 Public Consultation

Members of the public requesting general Project information were directed to the Project Website and notified of Public Meeting #2 held on December 13, 2017. As the Project progressed, the Project Mailing List was maintained and updated accordingly (**Appendix C1**). All public comments and issued responses received during the TPAP are provided in **Appendix C9**.

6.3.2.1 Public Meeting #2

6.3.2.1.1 Overview

Public Meeting #2 was held on December 13, 2017 from 6:30 PM to 8:30 PM at Robert Bateman High School in Burlington. The purpose of the meeting was to provide a Project update, outline the potential environmental impacts

and associated mitigation/monitoring measures, and receive feedback from the public during the TPAP. The meeting was held in an open house format where representatives from the Metrolinx Project Team, Consultant Team, and staff from the City of Burlington and Town of Oakville were available to answer questions and discuss Project details.

In total, approximately 20 individuals attended Public Meeting #2 and three (3) Feedback Forms were received by the Project Team.

Consultation materials developed in association with Public Meeting #2 are included in **Appendix C3**.

6.3.2.1.2 Notification

Notification for Public Meeting #2 was accomplished through the following:

- Notification via Canada Post mail to the following recipients:
  - Property owners within 30 m of the Study Area during the week of November 20, 2017
  - Residences and businesses within 100 m of the Study Area during the week of November 20, 2017
- Notification via registered mail to Indigenous communities on November 22, 2017
- Notification via e-mail to all federal, provincial, and municipal agencies, and other interested stakeholders on November 22, 2017
- Posting on the Project Website (www.metrolinx.com/Burloak) on November 22, 2017
- Publication in the following newspapers:
  - Burlington Post – November 23, 2017 and November 30, 2017
  - Oakville Beaver – November 23, 2017 and November 30, 2017
- Posting at Burlington, Appleby, and Bronte GO Stations from November 23, 2017 to December 13, 2017

6.3.2.1.3 Information Presented

The following information was presented at Public Meeting #2:

- The GO Lakeshore West Rail Corridor Service Plan;
- Overview of the Burloak Drive Grade Separation Project;
- Description of the TPAP;
- Preliminary design details of the Project, including construction of a 6-lane underpass, temporary detour of Burloak Drive and diversion of tracks, utility relocation, and potential property impacts;
- Results of the environmental studies undertaken to date (including potential impacts, proposed mitigation measures and monitoring); and
- Project Schedule and Next Steps.

Public Meeting #2 materials (i.e., display boards) were posted on the Project Website following the meeting.

6.3.2.1.4 Summary of Comments Received

In total, approximately 2020 individuals attended Public Meeting #2. The Project Team received three (3) Feedback Forms and nine (9) public comments via e-mail during the consultation period for Public Meeting #2, between December 13, 2017 and January 17, 2018.

The sections below summarize the most common concerns noted by participants. Further details are provided in the Public Meeting #2 Summary Report, provided in **Appendix C3**.

Pedestrian/Cyclist Safety

Some participants noted concerns regarding pedestrian/cyclist safety, including with the lack of physical barrier from vehicular traffic and cyclists, as well as the shared multi-use path for pedestrians and cyclists.

Environmental Studies

Participants engaged with the Project Team regarding the environmental studies completed to date and requested to review this information.

Noise and Vibration

Some participants were interested in the results of the noise and vibration analysis, specifically if there will be a noise increase as a result of increased train volumes and what mitigation is proposed. Metrolinx explained that the noise and vibration modelling for the Lakeshore West Rail Corridor concluded that the impacts are considered non-significant and noise mitigation is not required. This was assessed separately as part of the GO Rail network Electrification TPAP and is documented in the Noise and Vibration Modelling Report completed in 2017.

6.3.3 Agency Consultation

Agencies were sent a formal notification of the Notice of Commencement and Public Meeting #2 via e-mail on November 22, 2017. These letters and e-mails are provided in **Appendix C2**.

Table 6-5 summarizes outreach, correspondence, and meetings with review agencies (i.e., federal, provincial, municipal, and conservation authorities) undertaken during the TPAP. All relevant correspondence is also documented in **Appendix C10**.

Table 6-5: Summary of TPAP Consultation with Review Agencies

Agency	Date	Summary
Ministry of Tourism, Culture and Sport Karla Barboza, (A) Heritage Team Lead	November 27, 2017	• Responded to the Notice of Commencement advising of the appropriate MTCS contacts for future distributions.
Ministry of Transportation Graham Routledge, Highway Corridor Management Section	December 12, 2017	• MTO requested design drawings to confirm the area of traffic impact during construction staging. MTO noted that a traffic study must be submitted to MTO for review and approval. MTO noted that should any lane closures and/or traffic control signs be required during construction staging on Burloak Drive within the Ministry's ROW, an encroachment permit is required in accordance with OTM Book 7.
	December 13, 2017	• Metrolinx provided the traffic study that was completed as part of the TPAP and noted there are no construction impacts to the Ministry's ROW. Metrolinx will provide 30% design drawings in early 2018 and advised of the review period following Notice of Completion.
Ministry of the Environment and Climate Change Anne Cameron, Burloak Project Officer	December 19, 2017	• Metrolinx provided responses to comments on the 90% EPR and provided the 95% EPR with agency comments incorporated.
	January 9, 2018	• MOECC provided comments on the 95% EPR submission.
Ministry of Tourism, Culture and Sport Laura Hatcher, Heritage Planner	December 19, 2017	• Metrolinx provided responses to comments on the 90% EPR and provided the 95% EPR with agency comments incorporated.
	January 89, 2018	• MTCS noted that their previous comment is addressed in the 95% EPR and there are no further comments.

Table 6-5: Summary of TPAP Consultation with Review Agencies

Agency	Date	Summary
Halton Region Karyn Poad, Senior Project Manager Transportation	December 19, 2017	• Metrolinx provided responses to comments on the 90% EPR and provided the 95% EPR with agency comments incorporated.
City of Burlington Scott Hamilton, Manager Design & Construction	December 19, 2017	• Metrolinx provided responses to comments on the 90% EPR and provided the 95% EPR with agency comments incorporated.
Town of Oakville Dan Cozzi, Director Engineering & Construction	December 20, 2017	• City of Burlington and Town of Oakville each requested four (4) copies of the EPR be provided for the review period following Notice of Completion.
Conservation Halton Heather Dearlove, Environmental Planner	December 19, 2017	• Metrolinx provided responses to comments on the 90% EPR and provided the 95% EPR with agency comments incorporated.
	December 20, 2017	• Conservation Halton requested four (4) copies of the EPR be provided for the review period following Notice of Completion.

6.3.4 Indigenous Community Consultation

As noted in **Section 6.2.3**, the following Indigenous communities were provided with the Notice of Commencement on November 22, 2017:

- Haudenosaunee Confederacy Chiefs Council
- Métis Nation of Ontario
- Mississaugas of the New Credit First Nation
- Six Nations of the Grand River Territory

These letters and e-mails are provided in **Appendix C2**. Metrolinx followed up with each of these communities via phone call shortly after the letters were sent.

Metrolinx did not receive correspondence from any of the above-noted Indigenous communities in response to the Notice of Commencement. As such, there is no documentation of consultation with Indigenous communities during the TPAP.

6.3.5 Other Stakeholder Consultation

6.3.5.1 Elected Officials and Community Organizations

Elected officials and community organizations were sent a formal notification of the Notice of Commencement and Public Meeting #2 via e-mail on November 22, 2017. These letters and e-mails are provided in **Appendix C2**.

Table 6-6 provides a summary of consultation with elected officials and community organizations undertaken during the TPAP. All relevant correspondence and meeting summaries are also documented in **Appendix C11**.

Table 6-6: Summary of TPAP Consultation with Elected Officials and Community Organizations

Stakeholder	Date	Summary
Oakville Town Council Regional Councillor O'Meara (Ward 1)	November 23, 2017	• Regional Councillor noted support of the Project.

6.3.5.2 Other Stakeholders

Other stakeholders (e.g., utility companies) were sent a formal notification of the Notice of Commencement and Public Meeting #2 via e-mail on November 22, 2017. These e-mails are provided in **Appendix C2**.

Table 6-7 provides a summary of all other stakeholder consultation (i.e., stakeholder consultation not captured in previous sections) undertaken during the TPAP. All relevant correspondence and meeting summaries are also documented in **Appendix C11**.

Table 6-7: Summary of TPAP Consultation with Other Stakeholders

Stakeholder	Date	Summary
Rogers Communications	November 27, 2017	• Rogers provided a markup drawing and response form detailing no conflict with cautionary notes.
Enbridge Pipelines Inc.	December 8, 2017	• Enbridge owns and operates a pipeline approximately 600 m east of Burloak Drive and advised that a standard crossing agreement will be required if the pipeline is impacted.
	December 8, 2017	• Metrolinx noted that the pipeline is outside of the Study Area and will not be impacted.
Union Gas	December 11, 2017	• Union Gas has identified a natural gas pipeline in the area.
	December 12, 2017	• Metrolinx advised that the drawings are being reviewed internally and will be available for public review upon Notice of Completion.
Zayo Group	December 13, 2017	• Zayo noted that there is an existing plant within the Study Area and asked to be kept informed.
	December 13, 2017	• Metrolinx followed up requesting drawings of the plant location to help determine if there are any conflicts.
	December 13, 2017	• Zayo requested a drawing to markup and noted that the conduit runs along the west side of Burloak Drive from Harvester Road to just north of Superior Court.
Zeton Pilot Plant Technology Inc.	January 8, 2018	• Metrolinx followed up regarding discussion with the Oakville Chamber of Commerce.
	January 10, 2018	• Zeton noted that there has been discussion with the Oakville Chamber of Commerce regarding next steps.

6.3.6 Notice of Completion

The Notice of Completion was issued to the public on January 18, 2018 through the Project Website, and was published in the *Burlington Post* and *Oakville Beaver* on January 18, 2018 and February 1, 2018. A copy of the Notice of Completion is provided in **Appendix C2**.

The Notice of Completion was sent by e-mail and addressed mail to the MOECC Special Project Officer, MOECC Environmental Approvals Branch Director, and MOECC Environmental Approvals Branch Regional Director.

To reach the online audience, social media posts on Metrolinx and GO Transit Facebook pages and Twitter accounts (@Metrolinx, @MetrolinxFR, @GOTransit and @GOTransitFR) were posted during the week of January 22, 2018 until January 29, 2018. To further reach interested residents and local GO transit users, the Notice of Completion was posted at the Bronte, Appleby and Burlington GO Stations from January 18, 2018 until February 16, 2018.

The Notice of Completion was also e-mailed to stakeholders (including property owners on the Project Mailing List, government review agencies and Indigenous communities) and attendees of Public Meeting #1 and Public Meeting #2, where e-mail was available.

6.4 Future Consultation

Metrolinx is committed to continuing to engage and communicate with stakeholders beyond the TPAP. Specifically, Metrolinx shall:

- Design and implement a response strategy to address/resolve potential construction concerns;
- Maintain the Project Website throughout detailed design and construction where the public can access updated information on the Project; and
- Continue discussions/consultation with local stakeholders with respect to potential impacts during detailed design and construction, as appropriate.

7. Permits, Approvals and Commitments and Future Work

7.1 Permits and Approvals

In accordance with *O. Reg. 231/08*, the TPAP will be completed when Metrolinx submits a Statement of Completion to the Director and Regional Director of the MOECC.

In addition to the commitments to future work outlined in **Table 7-1**, permits and approvals obtained for the proposed works, as outlined in the following sections, may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval shall be implemented.

7.1.1 Federal

7.1.1.1 Fisheries and Oceans Canada (DFO)

It is anticipated that the construction works will not cross Sheldon Creek East, which is just east of the eastern limit of construction work. However, if it is determined during detailed design that in or near water works are required, a Self-Assessment under the *Fisheries Act* shall be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO.

7.1.1.2 Transport Canada

The *Navigation Protection Act (NPA*) includes a schedule of navigable waters that require regulatory approval for works that risk a substantial interference with navigation. No waterways are crossed by this Project, and Sheldon Creek East is not named as a “scheduled” navigable waterway, so a Notice of Works would not be required under the *NPA.*

7.1.2 Provincial

7.1.2.1 Ministry of the Environment and Climate Change (MOECC)

As prescribed under *O. Reg. 63/16*, water taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through EASR. In accordance with Section 34 of the *OWRA*, a Category 3 PTTW from MOECC must be obtained for the taking of more than 400,000 L/day of groundwater for the purposes of construction dewatering from any given source. Approvals for the discharge of pumped water may also be required, and could be a combination of Municipal Discharge Permits, agreement with Conservation Halton, and/or MOECC ECA in accordance with Section 53 of the *OWRA*. A water discharge management plan would be required, as necessary, based on pre-consultation discussion with MOECC and Conservation Halton staff since the discharge of dewatering effluent may potentially be directed to Sheldon Creek East, depending on the baseline groundwater quality analysis results. Permitting requirements shall be confirmed during detailed design, when specific details such as construction timing and methods are known.

Project construction is expected to generate excess soil that cannot be reused on site due to its geotechnical properties or quality of the excess soil. In all cases the on-site and off-site beneficial reuse of excess soil will be explored during detailed design and shall be undertaken in accordance with *Excess Soil – A Guide to Best Management Practices* (MOECC, January 2014). It is noted that the MOECC is presently contemplating the creation of a Regulation to govern excess soil management. Should this Regulation come into force within the implementation of the Project the requirements shall be incorporated, as applicable.

7.1.2.2 Ministry of Natural Resources and Forestry (MNRF)

7.1.2.2.1 Terrestrial

The MNRF shall be consulted during detailed design to confirm the initial SAR screening assessment and whether an authorization or permit under the *ESA* is required.

Targeted surveys during the breeding bird season to confirm presence/absence of SAR birds shall also be undertaken during detailed design, with protocols confirmed with the MNRF in advance. A nest search of the bridge structure and other structures within the Study Area is recommended if construction activities are scheduled during the breeding bird window (April 1st to August 31st) to ensure that no Barn Swallows, Chimney Swifts, or other migratory birds protected under the *MBCA, Fish and Wildlife Act,* or *ESA* are nesting on structures that may be affected by construction activities.

Although habitat for bat SAR within the Study Area was not identified, consultation with MNRF during detailed design regarding potential *ESA* permitting will identify the need for any additional SAR-targeted surveys, mitigation and/or compensation measures and monitoring requirements based on the recently-released survey protocol for bat SAR *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat* (MNRF, 2017).

7.1.2.3 Ministry of Tourism, Culture and Sport (MTCS)

7.1.2.3.1 Cultural Heritage

No property within the Study Area is classified as a Provincial Heritage Property, and therefore no further cultural heritage studies (e.g., CHER) are required.

7.1.2.3.2 Archaeology

A Stage 1 AA was carried out for the Study Area, and this has been submitted to MTCS in accordance with Section 65 of the *Ontario Heritage Act.* A Stage 2 AA is being undertaken for lands that will be impacted by the Project that were found to retain potential for archaeological resources. The Stage 2 AA Report shall be submitted to MTCS.

7.1.3 Municipal (Halton Region, City of Burlington, Town of Oakville)

Although Metrolinx, as a Provincial Agency, is not subject to municipal permits and approvals, Metrolinx will endeavour to adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible, and shall submit applications for review and information.

Where possible, Metrolinx shall continue to communicate and engage with the City of Burlington and Town of Oakville during detailed design and construction planning to ensure that municipal concerns are addressed in the construction plans prior to commencement of construction activities, as applicable.

7.1.4 Other

7.1.4.1 Conservation Halton

The activities of all federal and provincial Crown corporations are exempt from conservation authority permitting activities under Section 28 of the *Conservation Authorities* Act and under Ontario Regulation 162/06 – *Halton Region Conservation Authority Regulation of Development, Interference with Wetlands and Alteration to Shorelines and* Watercourses. Projects on lands owned by a Crown corporation and on behalf of a Crown corporation are also exempt. As a provincial Crown corporation, Metrolinx is not required to apply for and obtain permits from Conservation Authorities. Notwithstanding this, wherever possible, Metrolinx shall engage Conservation Authorities on specific projects (or components thereof) and shall adhere to requirements where possible and feasible on aspects such as tree protection/removal, sewer discharge and requirements for working within Regulated Areas.

7.1.4.2 Utilities

The final assessment of utility conflicts shall be reviewed in consultation with each utility company as part of detailed design. Implementation and construction obligations shall be undertaken pursuant to the crossing agreements with each of the utility companies as required.

7.2 Commitments and Future Work

7.2.1 Summary of Mitigation and Monitoring Requirements

The EPR commitments are developed to satisfy the requirements of *O. Reg. 231/08*. Specifically the purpose of the commitments is to facilitate the implementation of the Project in accordance with the mitigation measures and monitoring activities described in the EPR and in a manner that does not result in negative impact on matters of provincial interest related to the natural environment or to cultural heritage value or interest, or on constitutionally protected Aboriginal or treaty rights.

Establishing EPR commitments also satisfies the requirements of the TPAP Guide. Specifically, Section 4.3 of the Guide prescribes that the monitoring actions identified in the EPR respecting the mitigation measures must be carried out and reported.

A summary of EPR commitments is provided in **Table 7-1**. All applicable permits, licences, approvals and monitoring requirements under environmental laws shall be reviewed, confirmed and obtained by Metrolinx prior to the construction of the Project.

7.2.2 Environmental Mitigation and Monitoring Plan (EMMP)

An Environmental Mitigation and Monitoring Plan (EMMP) shall be developed to outline the responsibility for carrying out monitoring and reporting activities, including timing and frequency of monitoring activities, as well as the compliance process. The EMMP shall include all mitigation measures, categorized by project phase, and shall identify the party responsible for implementation.

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline	EPR Commitments			
	Mitigation Measure (or related action) or Future Commitment	Responsible Party	Monitoring Activity Requirements	Responsible Party
Engineering – Bridge Design and Road Widening	*Detailed Design* • Refinements to Project design (within the footprint of the Study Area) shall occur during detailed design, along with any associated technical studies to assess potential impacts, where required.	• Contractor	• N/A	• N/A
Natural Environment – Designated Features	*Construction* • Implement the following mitigation measures: ▪ Vegetation removal shall be kept to a minimum, limited to within the construction disturbance area and scheduled to occur outside of the overall bird nesting season of April 1st to August 31st, following the mitigation measures described in **Section 4.2.3.2**. ▪ Areas for vegetation removal shall be refined during detailed design, if required (e.g., change in construction disturbance area, final staging areas). ▪ Stockpiled materials or equipment shall be stored within the Study Area, but shall avoid Sherwood Forest Park and be kept at least 30 m away from the east branch of Sheldon Creek. ▪ Construction fencing and/or silt fencing, where appropriate, shall be installed and maintained to clearly define the construction disturbance area and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. Fencing shall be monitored and repaired as necessary throughout the construction period and shall be removed and disposed of accordingly, post-construction. ▪ Any damaged trees shall be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an Arborist. ▪ Exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion. ▪ Wherever possible, Metrolinx shall engage Conservation Halton and shall adhere to requirements where possible and feasible on aspects such as tree protection/removal, sewer discharge and requirements for working within Regulated Areas. ▪ Additional mitigation measures regarding vegetation removal, and relevant to designated features, are described below in **Section 4.2.2.2**. ▪ Prior to construction, a Stormwater Management Report shall be completed during detailed design to determine impacts and mitigation measures associated with Sheldon Creek and the associated floodplain. Consultation with Conservation Halton is required prior to commencing the report to confirm requirements. Prior to report finalization, Conservation Halton will review and approve the report.	• Contractor	• N/A	• N/A
Natural Environment – Naturalized Areas and Vegetation Communities	*Construction* • Implement the following mitigation measures where vegetation removal may be required: ▪ Vegetation removal shall be kept to a minimum, limited to within the construction disturbance area and scheduled to occur outside of the overall bird nesting season of April 1st to August 31st, following the mitigation measures described in **Section 4.2.3.2**. ▪ Areas for vegetation removal shall be refined during detailed design, if required (e.g., change in construction disturbance area, final staging areas). ▪ Stockpiled materials or equipment shall be stored within the Study Area, but shall avoid Sherwood Forest Park and be kept at least 30 m away from the east branch of Sheldon Creek. ▪ Construction fencing and/or silt fencing, where appropriate, shall be installed and maintained to clearly define the construction disturbance area and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. Fencing shall be monitored and repaired as necessary throughout the construction period and shall be removed and disposed of accordingly, post-construction. ▪ Any damaged trees shall be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an Arborist. ▪ Exposed soils shall be stabilized and re-vegetated as soon as possible to reduce erosion. ▪ On-site inspection shall be undertaken as required during construction to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities. ▪ Mitigation measures specific to trees shall be adhered to, including municipal by-law permitting requirements where applicable, that are summarized in **Appendix B2**, and which shall be further detailed in an Arborist Report to be completed during detailed design. • An Arborist Report shall be completed during detailed design that shall contain at a minimum the following information in addition to details of tree location, size, species, conditions and category: ▪ Recommendations for tree/vegetation protection and preservation measures for all trees/vegetation that are to be retained; ▪ Details of tree pruning; ▪ Details of all trees/vegetation recommended for removal including removal measures; ▪ Mitigation and monitoring measures to ensure success of preservation and removal measures; ▪ Should vegetation compensation be required, it shall be in accordance with the Metrolinx Vegetation Compensation Protocol; and ▪ Mapping. • Metrolinx is establishing a Vegetation Compensation Protocol for GO Expansion projects and vegetation that is removed shall be compensated for in accordance with the provisions of this protocol: ▪ **For Municipal/Private Trees**: Metrolinx shall work with each municipality to develop a municipality-wide streamlined tree permitting/compensation approach for municipal and private trees. The goal is to reduce administrative permitting burden for trees along long stretches of rail corridor. ▪ **For Trees within Metrolinx Property**: Metrolinx is developing a methodology to compensate for trees within Metrolinx's property. This will involve categorizing tree community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan. ▪ **Conservation Authorities**: For vegetation removals within Conservation Authority lands where required, applicable removal and restoration requirements shall be followed. ▪ **Federal lands**: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements shall be followed. ▪ **Tree end use**: Metrolinx shall develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options).	• Contractor	• N/A	• N/A

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline	EPR Commitments			
	Mitigation Measure (or related action) or Future Commitment	**Responsible Party**	**Monitoring Activity Requirements**	**Responsible Party**
Natural Environment – Wildlife and Wildlife Habitat	*Construction* • The following mitigation measures apply to all project components with respect to potential effects to breeding birds where vegetation removal may be required: ▪ To reduce the possibility of contravention of the *MBCA*, vegetation removal shall be scheduled to occur outside of the overall bird nesting season of April 1st to August 31st and strictly shall not occur within complex habitat (i.e., the CUT1, CUW1, MAS2-1, MAM2 and FOD7 communities identified within the Study Area; see **Figures 3-2A** and **3-2B**) as defined by ECCC, during the core bird nesting season of May 1st to July 31st, when a minimum of 60% of nesting activity occurs in each of the three (3) habitat types, as per ECCC's nesting Calendar for Zone C2 (ECCC, 2014). However, it should be noted that some birds may nest before and after this peak bird nesting season due to annual seasonal fluctuations. Therefore, if a nest of a migratory bird is found within the construction area outside of this nesting period it still receives protection. • If vegetation must be removed during the overall bird nesting season: ▪ Nest and nesting activity searches shall be conducted in areas defined as simple habitat (i.e., the CUM1-1 communities and the bridge structure identified within the rail corridor, as well as isolated trees and shrubs along Burloak Drive) by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity shall be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001). – If an active or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines shall be applied to the nest or confirmed nesting activity wherein no vegetation removal shall be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which shall be confirmed by a qualified Biologist, but shall protect a minimum of 10 m around the nest or nesting activity. – The results of all nest searches shall be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites. ▪ If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same best management practices such as nest and nesting activity searches described above shall be undertaken. ▪ Any bridge structures and other suitable man-made structures within the Study Area shall be inspected for evidence of active bird nests during the breeding bird season prior to the onset of construction activities in order to determine appropriate nesting preventative measures (e.g., netting).	• Contractor	• N/A	• N/A
Natural Environment – Fish and Fish Habitat	*Construction* • Where feasible, follow best management practices for near water works. This includes working within permissible timing windows for the protection of the sensitive life stages/processes of migratory and resident fish. The east branch of Sheldon Creek has a warmwater thermal regime and therefore construction near the watercourse shall occur during July 1 to March 31 of any given year. • When possible, construction activities near water shall be scheduled in order to avoid wet, windy and rainy periods that may increase erosion and sedimentation. • An Erosion and Sediment Control Plan for the work site shall be prepared prior to and implemented during construction to minimize the risk of sedimentation to the waterbody during all phases of construction. • Erosion and sediment control measures shall be maintained until all disturbed ground has been permanently stabilized. The Erosion and Sediment Control Plan shall, where applicable, include: ▪ Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the waterbody; and ▪ Measures for managing water flowing onto the site. • Measures shall be undertaken to contain and stabilize any waste material (e.g., construction waste and materials); • Inspection and maintenance of erosion and sediment control measures and structures shall happen regularly (e.g., monthly) and after storm events during the course of construction; • Repairs to erosion and sediment control measures and structures shall take place if damage occurs; and • Erosion and sediment control materials shall be removed once site is stabilized. • Machinery shall arrive on site in a clean condition and be maintained free of fluid leaks, invasive species and noxious weeds. Machinery shall be washed, refuelled, and serviced properly away from any waterbody (at a minimum of 30 m). Storage of fuel and other materials for the machinery at least 30 m away from the watercourse and in such a way as to prevent any deleterious substances from entering the water; • Activities near water shall be planned to ensure that materials such as paint, primers, blasting abrasives, rust, solvents, degreasers, grout or other chemicals do not enter the watercourse; • A response plan for spills shall be developed before work commences. This plan shall be implemented immediately in the event of a sediment release or spill of a deleterious substance and an emergency spill kit shall be kept on site; • All construction materials shall be removed from site upon Project completion. • Clearing of riparian vegetation shall be kept to a minimum, and existing trails, roads or pathways shall be used wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting, if required; and • Watercourse banks disturbed by any activity associated with the Project shall be immediately stabilized to prevent erosion and/or sedimentation, and revegetated with native species suitable for the site.	• Contractor	• N/A	• N/A
Natural Environment – Bird SAR or SOCC	*Construction* • Mitigation measures associated with vegetation removal as described in **Section 4.2.2.2** shall be implemented to reduce potential direct and indirect effects to SAR birds, in particular both the Barn Swallow and Eastern Wood-pewee. It is recommended that construction timing occur outside of the breeding season to ensure no impact to the breeding SAR birds, where possible, and where not possible that additional mitigation such as nest surveys be completed, as described in **Section 4.2.3.2**. It is recommended that vegetation removals avoid cultural woodlands to ensure no effects to the Eastern Wood-pewee potential habitat.	• Contractor	• N/A	• N/A

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline	EPR Commitments			
	Mitigation Measure (or related action) or Future Commitment	**Responsible Party**	**Monitoring Activity Requirements**	**Responsible Party**
Geology and Groundwater	<u>*Detailed Design*</u> • Estimates of water taking quantities and resultant dewatering ZOI shall be determined during detailed design. • If dewatering is required, a Dewatering Management Plan shall be prepared to provide the procedures and protocols to be implemented to ensure that all site dewatering activities are completed in a manner that does not cause harm to the environment and meets applicable by-laws, codes, regulations and standards, while preventing site flooding from groundwater infiltration. • A Soil and Groundwater Management Plan shall be prepared to describe the general principles and develop specific protocols to address the handling, management and disposal of groundwater that is generated or encountered during the Project construction. • An Erosion and Sediment Control Plan shall be developed and shall include the requirement for a spill kit to be on site at all times during construction. Implementation of the erosion and sedimentation control measures shall conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Sediment and erosion control measures (e.g., silt curtains, silt fence) shall be installed prior to site clearing, grubbing, excavation or grading works. To ensure the Erosion and Sediment Control Plan is successfully performing, an Erosion and Sediment Control Monitoring Plan shall be implemented during construction. • A Spill Prevention and Response Plan shall be developed outlining steps to prevent and contain any chemicals and/or spills in a timely and effective manner and to avoid soil and water contamination. <u>*Construction*</u> • As prescribed under *O. Reg. 63/16*, water taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through the EASR. Where construction dewatering volumes are expected to exceed 400,000 L/day, a Category 3 PTTW shall be required from MOECC, in accordance with Section 34 of the *Ontario Water Resources Act* (OWRA). Similarly, approvals for the discharge of pumped water also may be required, which could include one or a combination of Municipal Discharge Permits, and/or MOECC ECA (OWRA, Section 53). • Any discharge of water is subject to the terms and conditions of all required permits and approvals obtained by the Contractor based on the expected site conditions. • Implement the following construction plans developed during detailed design: ▪ Dewatering Management Plan ▪ Groundwater Management Plan ▪ Erosion and Sediment Control Plan ▪ Spill Prevention and Response Plan	• Contractor	<u>*Detailed Design*</u> • Requirements for monitoring during active construction dewatering for any potential adverse effects shall be identified during detailed design. <u>*Construction*</u> • To ensure the Erosion and Sediment Control Plan is successfully performing, an Erosion and Sediment Control Monitoring Plan shall be implemented during construction..	• Contractor
Air Quality	<u>*Detailed Design*</u> • An Air Quality Management Plan shall be developed to address the areas of construction equipment and vehicle exhaust, potential traffic disruption and congestion, fugitive dust, and odor. It is further recommended that mitigation measures detailed in "*Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (March 2005)"* prepared by Cheminfo for Environment Canada be implemented, where practical. Potential mitigation measures for these areas are discussed as follows: ▪ All equipment and vehicles shall be kept properly maintained and repaired to minimize exhaust emissions, including odours; ▪ Excessive idling of vehicles and equipment (greater than five minutes) shall be minimized. Other potential mitigation measures may include the use of alternative-fueled or electric equipment where possible; ▪ Implementing good practices including wetting exposed earth areas; covering dust-producing materials during transport; and limiting construction activities during high wind conditions will minimize the impacts of fugitive dust. Potential mitigation measures that may be employed by the construction contractor to reduce fugitive dust issues include: – Seeding, paving, covering, wetting, or otherwise treating disturbed soil surfaces – Minimizing storage and unnecessary transfers of spoils and debris on-site – Using wind screens or fences; – Covering all truckloads of dust-producing material; – Removing all loose or unsecured debris or materials from empty trucks prior to leaving the site; – Reducing traffic speeds on any unpaved surfaces; – Vacuum sweeping or watering of all paved surfaces and roads on which equipment and truck traffic enter and leave the construction areas; – Using wheel washes and truck washes at site egresses; – Modifying work schedules when weather conditions could lead to adverse impacts (e.g., very dry soil and high winds); and – Ensuring that the areas most impacted by particulate levels are vegetated (i.e., tree planting) to reduce the cumulative particulate impacts.	• Contractor	• N/A	• N/A
Noise and Vibration	<u>*Construction*</u> • Noise from construction activities shall be controlled to ensure that the guideline limits are not exceeded, where possible. Construction noise can be controlled in numerous ways, including operational restrictions and source mitigation measures, as well as receptor-based mitigation measures. Prior to construction, a Noise and Vibration Control Plan shall be developed to reduce the noise impacts at sensitive receptors. The plan shall include the following details: ▪ What measures are being taken to comply with local by-laws whenever possible (e.g., road construction activities during the day instead of at night); ▪ If construction needs to be undertaken outside of the normal daytime hours, how local residents shall be informed beforehand of the type of construction planned and the expected duration; ▪ How construction equipment shall meet the noise level specifications in MOECC guidelines NPC-115 and NPC-118; ▪ What noise control measures are being implemented, e.g.,: – Implement noise compliance checks to ensure equipment levels are in compliance with MOECC guidelines NPC-115 and NPC-118; – Keep equipment well-maintained and fitted with efficient muffling devices;	• Contractor	• N/A	• N/A

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline		EPR Commitments			
		Mitigation Measure (or related action) or Future Commitment	**Responsible Party**	**Monitoring Activity Requirements**	**Responsible Party**
		– Restrict idling of equipment to the minimum necessary to perform the specified work; – Avoid unnecessary revving of engines and switch off equipment when not required (do not idle); – Co-ordinate 'noisy' operations such that they will not occur simultaneously, where possible; – Use rubber linings in chutes and dumpers to reduce impact noise, where possible; – Minimize drop heights of materials; and – Route haulage/dump trucks on main roads where possible, rather than quieter residential roads. ▪ Development of a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable noise levels at noise sensitive receivers are maintained for the duration of construction • Note that Ministry of Labour requirements and Ontario's Occupational Health & Safety Act and Regulations (Reg. 231/91-105) specify obligations for dump trucks to be equipped with automatic audible reversal alarms when operated in reverse. • During construction work, if it is determined that there is a need to further reduce noise effects, additional mitigation measures may be considered and implemented, where appropriate. • Prior to construction, a Noise and Vibration Control Plan shall be developed to reduce potential disturbance to nearby building occupants. The plan shall address the following measures: ▪ What measures are being taken to comply with local by-laws whenever possible (e.g., road construction activities during the day instead of at night); ▪ If construction needs to be undertaken outside of the normal daytime hours, how will local residents be informed beforehand of the type of construction planned and the expected duration; ▪ What vibration control measures are being implemented, e.g.,: – Consider the use of construction methods which may minimize vibration, where possible; and – Use lower vibration-generating equipment where practical. ▪ Development of a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable vibration levels at sensitive receivers are maintained for the duration of construction. ▪ Blasting operations are typically prohibited by the City of Burlington and Town of Oakville; however, if blasting is unavoidable, the Contractor must obtain approval from the municipalities, and undertake a detailed impact assessment and implement appropriate mitigation measures to ensure compliance with local by-laws and MOECC guidelines, including NPC-119 *Blasting*, included in the Model Municipal Noise Control By-law. • No specific construction vibration mitigation measures are anticipated to be required to address potential building damage, assuming there will be no impact or vibratory pile driving, and vibratory rollers shall be set back at least 8 m from existing structures and buildings. • During construction work, if it is determined that there is a need to further reduce vibration effects, additional mitigation measures may be considered and implemented, where appropriate. <u>*Operations*</u> • Mitigation measures outlined above shall also be implemented during maintenance activities, where appropriate.			
Socio-Economic Environment – Community Features		<u>*Construction*</u> • Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan. • Access to residences shall be maintained at all times. • Local residents potentially affected by construction nuisance effects shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.	• Metrolinx and Contractor	• N/A	• N/A
Socio-Economic Environment – Existing Land Use	*Residential Uses*	<u>*Construction*</u> • Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan and other specific mitigation measures described in **Appendix B4**. • Access to residences shall be maintained at all times. Local residents potentially affected by construction nuisance effects shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.	• Metrolinx and Contractor	• N/A	•
	Commercial Uses	<u>*Construction*</u> • Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan and other specific mitigation measures described in **Appendix B4**. • Access to businesses shall be maintained at all times. Potentially affected business owners shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.	• Metrolinx and Contractor	• N/A	•
	Industrial Uses	<u>*Construction*</u> • Transport trucks will use the temporary Burloak Drive road detour. Access to industrial areas shall be maintained at all times. • Potentially affected stakeholders shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur. • Metrolinx shall continue to consult with Zeton Inc. and other affected stakeholders.	• Metrolinx and Contractor	• N/A	•
	Employment Areas	<u>*Construction*</u> • Potential noise effects are temporary and shall be mitigated through a Noise and Vibration Control Plan and other specific mitigation measures described in **Appendix B4**. • Access to employment areas shall be maintained at all times. Potentially affected stakeholders shall be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.	• Metrolinx and Contractor	• N/A	•
	Recreational Uses	<u>*Construction*</u> • At a minimum, safety fencing shall be used where necessary to separate the work area from pedestrians and/or cyclists. Construction signage shall also be utilized. Special directional signage may also be considered as a means to indicate re-routing of the multi-use path.	• Metrolinx and Contractor	• N/A	•

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline		EPR Commitments			
		Mitigation Measure (or related action) or Future Commitment	**Responsible Party**	**Monitoring Activity Requirements**	**Responsible Party**
	Parks and Open Space	*Construction* • Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed shall be compensated for in accordance with the provisions of this protocol: ▪ **For Municipal/Private Trees**: Metrolinx shall work with each municipality to develop a municipality-wide streamlined tree permitting /compensation approach for municipal and private trees. The goal is to reduce administrative permitting burden for trees along long stretches of rail corridor. ▪ **For Trees within Metrolinx Property**: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan. ▪ **Conservation Authorities**: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements shall be followed. ▪ **Federal lands**: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements shall be followed. ▪ **Tree End Use**: Metrolinx shall develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options). • If impacts to the soccer field in Sherwood Forest Park occur, the soccer field will be relocated to the south to retain its use. • Follow specific mitigation for vegetation removal described in the Natural Environment Report (**Appendix B1**).	• Contractor	• Follow specific monitoring for vegetation removal described in the Natural Environment Report (**Appendix B1**).	•
Socio-Economic Environment – Aesthetics / Visual Character		*Construction* • Tree/vegetation removal as a result of this Project shall be addressed and compensated through Metrolinx's Vegetation Compensation Protocol (**Section 4.6.2.7.2**). *Operations* • The aesthetics of retaining walls shall be finalized during detailed design in consultation with City of Burlington and Town of Oakville.	• Contractor	• N/A	• N/A
Socio-Economic Environment – Property		*Construction* • Properties with temporary access impacts (described in **Section 4.6.4.1.1**) will be required to use alternate access points during construction. The following proposed access mitigation shall be determined in consultation with the affected municipality and property owners: ▪ Petro Canada gas station (during regrading of entrance, access will be to/from the existing Wyecroft Road entrance) ▪ Undeveloped lands located at 845 Burloak Drive (property could be accessed via the existing Wyecroft Road entrance) ▪ Undeveloped lands located at 605 Burloak Drive (property could be accessed from the south through adjacent lands fronting onto Superior Court) • In the event that the Burloak Drive entrance to/from Burloak Common is impacted during construction, access shall be maintained using the existing secondary entrance off of Prince William Drive. Access to the Emshih Developments site (i.e., between Sherwood Forest Park and Burloak Drive) will be maintained during construction. • Where property easements are required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. Communications with stakeholders to identify local and site-specific issues may include discussions on topics such as: ▪ Construction access; ▪ Construction schedule; and ▪ Enquiries/complaint procedures. *Operations* • Permanent access impacts as a result of the Project (described in **Section 4.6.4.1.2**) shall be required to use alternate access points following construction. The following proposed access mitigation shall be determined in consultation with the affected municipality and property owners: ▪ Undeveloped lands located at 845 Burloak Drive (property could be accessed via the existing Wyecroft Road entrance; in addition, replacement entrance could be located at the north boundary of the property) ▪ Undeveloped lands located at 605 Burloak Drive (property could be accessed from the south through adjacent lands fronting onto Superior Court) • Following construction, the Petro Canada gas station access from Burloak Drive shall be restored at its current location with an increased driveway. • There is currently no access to the Emshih Developments site (north of Burloak Common). Future access may be provided through existing Burloak Common access. • For temporary access during Project operations and maintenance activities, agreements with adjacent property owners may be required for permanent easements.	• Metrolinx and Contractor	• N/A	• N/A
Socio-Economic Environment – Utilities		*Construction* • Additional SUE investigations may be conducted during detailed design, as required, to confirm existing utilities. • During detailed design, the municipalities will continue to be consulted regarding utilities. *Operations* • Potential access requirements as a result of maintenance within the Assessment Area shall be determined in consultation with relevant utility owners.	• Metrolinx and Contractor	• N/A	• N/A
Socio-Economic Environment – Transportation		*Construction* • Vehicles will be redirected around the construction site using a temporary road detour with the same number of lanes as the existing configuration. • The transit stop at Burloak Drive and Wyecroft Road (transit stop 2322) may be relocated onto Wyecroft Road east of the intersection. The transit stop on Burloak Drive at Prince William Drive (transit stop 2325) may be relocated south of the intersection. These relocations will be confirmed through consultation with affected municipalities during detailed design. • During construction, a temporary transit shuttle service will be provided in the Town of Oakville during the full road closures. • Metrolinx shall consult with Burlington Transit and Oakville Transit through construction meetings to determine if service modification is required and provide advance notification of construction works to the public. • In 2018, an updated City of Burlington Master Cycling Plan will be released. Information from this document should be considered during detailed design. *Operations* • All displaced transit stops will be rebuilt to municipality standards following construction. • A multi-use path will be constructed along the east side of the temporary road detour to provide a temporary pedestrian/cyclist route during construction. • A Construction Traffic Management Plan shall be completed prior to construction, which shall include construction signage and safety fencing requirements.	• Contractor	• N/A	• N/A

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline	EPR Commitments			
	Mitigation Measure (or related action) or Future Commitment	Responsible Party	Monitoring Activity Requirements	Responsible Party
Archaeology	• For lands within the Study Area that contain archaeological potential and will be impacted by the Project, the following recommendations of the Stage 1 AA shall be followed: 1. A Stage 2 AA shall be conducted by a licensed consultant archaeologist in areas identified as having archaeological potential if they cannot be avoided by the development. The Stage 2 AA will follow the requirements set out in the 2011 *Standards and Guidelines for Consultant Archaeologists* (MTCS 2011). 2. Areas coloured in yellow in **Figure 3-20** will be subject to Stage 2 pedestrian survey in accordance with Section 2.1.1 Pedestrian Survey in the *Standards and Guidelines for Consultant Archaeologists* (2011). Land to be surveyed must be ploughed deep enough to provide total topsoil exposure, as well as weathered with either one heavy rainfall or several small ones. Pedestrian survey is to be completed at 5 m transects. When archaeological sources are found, survey transects are to be done at 1 m intervals over a minimum 20 m radius around the find to determine its nature. All formal types of artifacts and diagnostic categories are to be collected. 3. Areas coloured in green in **Figure 3-20** will be subject to Stage 2 test pit survey in accordance with Section 2.1.2 Test Pit Survey in the *Standards and Guidelines for Consultant Archaeologists* (2011). Test pits should be placed at a maximum of 5 m intervals, and done to within 1 m of all built structures. All test pits must be at least 30 cm in diameter and dug 5 cm into subsoil. All soil is to be screened through no greater than 6 mm mesh, and all artifacts are to be collected with their associated test pit. After investigation, all test pits must be backfilled to grade. 4. All other areas in **Figure 3-20** do not require Stage 2 assessment due to being deeply disturbed, permanently wet, or have been previously assessed and cleared of archaeological concerns. • Upon completion, the Stage 2 AA report will be submitted to MTCS for approval and entry into the Ontario Public Register of Archaeology Reports. • Should the proposed work extend beyond the Study Area, a Stage 1 AA shall be conducted to determine the archaeological potential and requirement for further Stage 2 AA work of any additional lands. • Any additional Archaeological Assessments (e.g., Stage 2, Stage 3 if recommended by the Stage 2) shall be completed as early as possible, and prior to the completion of detailed design. This work shall be done in accordance with the *MTCS's Standards and Guidelines for Consultant Archaeologists* (2011) to identify any archaeological resources that may be present. • In the event that additional Stage 1 and/or Stage 2 AA identifies potential for the discovery of an Indigenous archaeological site, Metrolinx shall engage appropriate Indigenous communities to review the findings of the report and determine next steps and monitoring requirements to be considered during further stages of archaeological assessment. • Should previously unknown or unassessed deeply buried archaeological resources be uncovered during construction activities, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act.* The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological field work, in compliance with Section 48 (1) of the *Ontario Heritage Act*. Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered.	• Contractor	• N/A	• N/A
Traffic and Transportation	<u>*Construction*</u> • A Construction Traffic Management Plan shall be completed prior to commencing construction and will include consideration for construction staging to minimize traffic impacts. The Construction Traffic Management Plan will be developed in consultation with authorities having jurisdiction. • The Construction Traffic Management Plan shall outline the required construction signage that shall alert cyclists and pedestrians to the detour and guide them to the temporary multi-use path. • The Route #15 transit stops on Wyecroft Road (transit stop 2322) and on Burloak Drive at Prince William Drive (transit stop 2325) may be relocated south of the intersection. These relocations will be confirmed through consultation with affected municipalities during detailed design. <u>*Operations*</u> • A second southbound left-turn lane may be added at Burloak Drive and Harvester Road / Wyecroft Road to alleviate some of the delay experienced in the AM peak period (8:00AM to 9:00AM). Metrolinx shall consult with City of Burlington and Town of Oakville during detailed design to refine this mitigation. • All traffic signals shall be optimized post-construction to accommodate the increase in traffic and additional lanes. In consultation with the municipalities, options to reduce high V/C ratios will be considered during detailed design. • All displaced transit stops will be rebuilt to municipality standards following construction.	• Contractor	• N/A	• N/A
Stakeholder Engagement	<u>*Detailed Design / Construction*</u> • Design and implement a response strategy to address/resolve potential construction concerns. • Maintain the Project Website throughout detailed design and construction where the public can access updated information on the Project. • Continue discussions/consultation with local stakeholders with respect to potential impacts during detailed design and construction, as appropriate.	• Metrolinx	• N/A	• N/A
Permits and Approvals Required – General	<u>*TPAP*</u> • In accordance with *O. Reg. 231/08*, the TPAP will be completed when Metrolinx submits a Statement of Completion to the Director and Regional Director of the MOECC. • In addition to the commitments to future work outlined in **Table 7-1**, permits and approvals obtained for the proposed works may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval shall be implemented.	• Metrolinx and Contractor	• N/A	• N/A
Permits and Approvals Required – Federal	<u>*Detailed Design*</u> • If it is determined during detailed design that in or near water works are required, a Self-Assessment under the *Fisheries Act* shall be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by DFO.	• Contractor	• N/A	• N/A

Table 7-1: Summary of Future Commitments and Monitoring Requirements

Discipline	EPR Commitments			
	Mitigation Measure (or related action) or Future Commitment	Responsible Party	Monitoring Activity Requirements	Responsible Party
Permits and Approvals Required – Provincial	<u>*Detailed Design*</u> • As prescribed under *O. Reg. 63/16*, water taking for construction site dewatering in excess of 50,000 L/day and under 400,000 L/day is subject to registration through EASR. In accordance with Section 34 of the *OWRA*, a Category 3 PTTW from MOECC must be obtained for the taking of more than 400,000 L/day of groundwater for the purposes of construction dewatering from any given source. Approvals for the discharge of pumped water will also be required, and could be a combination of Municipal Discharge Permits, agreement with Conservation Halton, and/or MOECC ECA in accordance with Section 53 of the *OWRA*. A water discharge management plan would be required, as necessary, based on pre-consultation discussion with MOECC and Conservation Halton staff since the discharge of dewatering effluent may potentially be directed to Sheldon Creek East, depending on the baseline groundwater quality analysis results. Permitting requirements will need to be revisited closer to the construction phase when specific details such as construction timing and methods are known. • Project construction is expected to generate excess soil that cannot be reused on site due to its geotechnical properties or quality of the excess soil. In all cases the on-site and off-site beneficial reuse of excess soil will be explored during detailed design and shall be undertaken in accordance with *Excess Soil – A Guide to Best Management Practices* (MOECC, January 2014). It is noted that the MOECC is presently contemplating the creation of a Regulation to govern excess soil management. Should this Regulation come into force within the implementation of the Project the requirements shall be incorporated, as applicable. • The MNRF shall be consulted during detailed design to confirm the initial SAR screening assessment and whether an authorization or permit under the *ESA* is required. • Targeted surveys during the breeding bird season to confirm presence/absence of SAR birds shall also be undertaken during detailed design, with protocols confirmed with the MNRF in advance. A nest search of the bridge structure and other structures within the Study Area is recommended if construction activities are scheduled during the breeding bird window (April 1st to August 31^{sh}) to ensure that no Barn Swallows, Chimney Swifts, or other migratory birds protected under the *MBCA, Fish and Wildlife Act,* or *ESA* are nesting on structures that may be affected by construction activities. • Although habitat for bat SAR within the Study Area was not identified, consultation with MNRF during detailed design regarding potential *ESA* permitting will identify the need for any additional SAR-targeted surveys, mitigation and/or compensation measures and monitoring requirements based on the recently-released survey protocol for bat SAR Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat (MNRF, April 2017). • A Stage 2 AA is being undertaken for lands that will be impacted by the Project that were found to retain potential for archaeological resources. The Stage 2 AA Report shall be submitted to MTCS.	• Contractor	• N/A	• N/A
Permits and Approvals Required – Municipal	<u>*Detailed Design*</u> • Metrolinx shall adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible, and will submit applications for review and information. • Where possible, Metrolinx will continue to communicate and engage with the City of Burlington and Town of Oakville during detailed design and construction planning to ensure that municipal concerns are addressed in the construction plans prior to commencement of construction activities, as applicable.	• Metrolinx and Contractor	• N/A	• N/A
Permits and Approvals Required – Conservation Halton	<u>*Detailed Design*</u> • Where possible, Metrolinx will engage Conservation Authorities on specific projects (or components thereof) and shall adhere to requirements where possible and feasible on aspects such as tree protection / removal, sewer discharge, and requirements for working within Regulated Areas.	• Metrolinx and Contractor	• N/A	• N/A
Permits and Approvals Required – Utilities	<u>*Detailed Design*</u> • The final assessment of utility conflicts shall be reviewed in consultation with each utility company as part of detailed design. Implementation and construction obligations shall be undertaken pursuant to the crossing agreements with each of the utility companies as required.	• Metrolinx and Contractor	• N/A	• N/A
Permits and Approvals Required	<u>*Detailed Design*</u> • An EMMP shall be developed to outline the responsibility for carrying out monitoring and reporting activities, including timing and frequency of monitoring activities, as well as the compliance process. • The EMMP shall include all mitigation measures, categorized by project phase, and shall identify the party responsible for implementation. <u>*Construction*</u> • Implementation of the EMMP, including the monitoring and reporting activities.	• Contractor	<u>*Construction*</u> • Monitoring activities outlined in the EMMP.	• Contractor

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9. Ontario Ministry of Environment is now known as Ontario Ministry of the Environment and Climate Change.